APPENDIX F

BLM and Forest Service Supporting Documentation

APPENDIX F.1

Evaluation of Project Consistency with Federal Land Management Plans of the USDOI Bureau of Land Management and USDA Forest Service

Jordan Cove Natural Gas Liquefaction and
Pacific Connector Gas Pipeline Project
Final EIS

Appendix F.1

Evaluation of Project Consistency with
Federal Land Management Plans of the
USDOI Bureau of Land Management and USDA Forest Service

Pacific Connector Gas Pipeline

Prepared for:

USDOI Bureau of Land Management and USDA Forest Service

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Appendix F.1

Evaluation of Project Consistency with Federal Land Management Plans of the USDOI Bureau of Land Management and USDA Forest Service

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1.0 RESOURCE MANAGEMENT PLAN CONSISTENCY EVALUATIONS FOR THE NORTHWESTERN AND COASTAL OREGON (COOS BAY DISTRICT, ROSEBURG DISTRICT-SWIFTWATER FIELD OFFICE) AND SOUTHWESTERN OREGON (LAKEVIEW DISTRICT-KLAMATH FIELD OFFICE, MEDFORD DISTRICT, ROSEBURG DISTRICT-SOUTH RIVER FIELD OFFICE) BLM ADMINISTRATIVE UNITS

The Federal Land Policy and Management Act of 1976 (FLPMA) as amended, and its implementing regulations in Title 43, Code of Federal Regulations (CFR) part 1600 requires all projects on BLM lands to be consistent with the Resource Management Plan (RMP) of the administrative unit where the project occurs. Where projects would not be consistent with the underlying RMP, the project cannot be implemented unless the RMP is amended to make provision for the project, or the project is modified to be consistent with RMP direction.

The Pacific Connector Project crosses BLM lands that are managed under two separate RMPs. The Coos Bay District and the Roseburg District-Swiftwater Field Office are managed according to the provisions of the Northwestern and Coastal Oregon RMP. The Lakeview District-Klamath Field Office, Medford District and the Roseburg District-South River Field Office are managed according to the provisions of the Southwestern Oregon RMP. This appendix documents review and evaluation of each RMP for BLM lands crossed by the Pacific Connector project. For each RMP element, a determination was made regarding (1) its applicability to the Project, (2) the consistency of the Project with the standard, and (3) in each table for each relevant element are the portion or portions of the DEIS that address the standard (expressed as EIS sections, EIS appendices, and POD attachments) and the relevant location of the EIS section where the element is addressed.

The applicability of each element was identified by relevant stage or stages of the PCGP Project (i.e., preconstruction, construction, restoration, and operation). The consistency of each standard was identified and expressed by adherence to agency-approved plans, designs, and procedures, application of agency-approved BMPs, careful and studied selection of the pipeline route, and implementation of agency-approved, off-site mitigation measures. This column is completed if an RMP amendment would be part of the agency decision-making process to ensure compliance with respective RMP. Column four identifies the specific RMP amendment that would be required.

Where certain sections of the RMP are not applicable, specific elements have been excluded to reduce the size of the tables (e.g., Adaptive Management Areas). On each table, the specific elements are presented in column one by RMP section (topic). In column two ("Applicable") of each table, the applicability of each element was identified by relevant stage or stages of the PCGP Project as follows:

P	Pre-construction
C	Construction
R	Restoration (includes offsite mitigation actions)
O	Operation
N	Not Applicable to any stage

Most of the relevant elements are applicable to more than one stage of the PCGP Project. In such cases, the codes are presented as above.

The consistency of each relevant element is expressed in column three (“Consistent”) of each table as follows:

P	Consistent via agency-approved plans, designs & procedures
B	Consistent via application of BMPs
R	Consistent via route selection
M	Consistent via offsite mitigation actions
A	Inconsistent, RMP amendment required

Most of the relevant standards achieve consistency by adherence to more than one consistency criterion. In such cases, the codes are presented as above. Included for each relevant element in column four of each table (“Comments”) is the portion or portions of the DEIS that address the element, expressed as follows:

- EIS section
- EIS appendix
- POD attachment

For each inconsistent Project action, the RMP plan amendment required to address the standard is specifically identified in column four.

1.1 NORTHWESTERN AND COASTAL OREGON APPROVED RESOURCE MANAGEMENT PLAN – 2016

Project consistency with this RMP is addressed in Table 1.1-1 below

TABLE 1.1-1

Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	Applicability	Consistency	EIS Section
Land Use Allocations — Congressionally Reserved Lands and National Conservation Lands			
Management Objectives			
Preserve the wilderness character of designated Wilderness Areas.	N		
Preserve wilderness characteristics in Wilderness Study Areas in accordance with defined standards until these lands become designated as Wilderness or other purposes.	N		
Protect and enhance the free-flowing condition, water quality, and outstanding remarkable values of eligible, suitable, and designed Wild and Scenic River corridors.	N		
Provide protection to Wild and Scenic River corridors that are suitable for inclusion in the National Wild and Scenic Rivers system.	P, C, R	P, B	EIS Sec. 4.8.1 EIS Sec. 4.9.2
Provide protection to Wild and Scenic River corridors that are eligible but have not yet been studied for suitability as components of the National Wild and Scenic Rivers system pending suitability evaluations.	P, C, R	P, B	EIS Sec. 4.8.1 EIS Sec. 4.9.2

TABLE 1.1-1

Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	**Applicability**	**Consistency**	**EIS Section**
Management Direction			
In designated Wilderness Areas, exclude all defined prohibited uses of Wilderness unless they have been demonstrated to be the minimum necessary to administer the area for the purposes of the Wilderness Act.	N		
Manage wildfires in designated Wilderness Areas using minimum impact suppression techniques wherever practicable, while providing for the safety of firefighters and the public and meeting fire management objectives. Address prohibited uses of Wilderness in wildfire management consistent with BLM Manual 6340.	N		
Provide for the enjoyment and appreciation of the resources, qualities, values, and associated settings and primary uses within National Trail rights-of-way and for which National Trails are designated.	N		
Enhance, promote, and protect the scenic, natural, and cultural resource values associated with current and future designated National Scenic and Historic Trails.	P, C, O	P, B	EIS Sec. 2.4.1 EIS Sec. 4.8.1 POD Att. S
Conduct silviculture treatments in National Trail management corridors only as needed to protect or maintain recreation setting characteristics or to achieve recreation objectives	N		
Conduct management actions in Wild and Scenic River corridors only if consistent with designated or tentative classifications and if any reductions in outstandingly remarkable values would be temporary and outstandingly remarkable values would be protected or enhanced over the long term.	N		
During wildfire management operations, use strategies and tactics that would protect outstandingly remarkable values and classifications within Wild and Scenic River corridors, except where the wildlife is deemed a threat to human safety or private property, or where use is essential for wildlife control, as deemed by the Incident Commander.	N		
Conserve and develop the scenic, natural, and historic values of the Yaquina Head Outstanding Natural Area and allow the continued use of the area for the purposes for which it was designated.	N		
Land Use Allocations — District-Designated Reserves			
Management Objectives			
Maintain the values and resources for which the BLM has reserved these areas from sustained-yield timber production.	P	P, B, A	EIS Sec. 1.5 EIS Secs. 4.4.1 & 4.4.2 POD Att. I POD Att. P POD Att. TU Amendment-District Designated Reserve EIS Section 2.1.3.1

TABLE 1.1-1

Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	Applicability	Consistency	EIS Section
Management Direction			
Manage constructed facilities and infrastructure, such as seed orchards, roads, communication sites, quarries, buildings, and maintenance yards, as needed for purposes for which the BLM constructed them.	P	A	Amendment-District Designated Reserve EIS Section 2.1.3.1
Maintain access to roads to facilities by removing hazard trees and blowdown. Such logs may be retained as down woody material, moved for placement in streams for fish habitat restoration, or removed through a commercial harvest or special forest products sale.	C, R, O	P, B	EIS Sec. 2.1.2 EIS Sec. 2.6.2 EIS Sec. 4.7.3 EIS Sec. 4.10.3 POD Att. I POD Att. Y
Manage seed orchards consistent with the Seed Orchard Records of Decision for Integrated Pest Management.	N		
Land Use Allocations — District-Designated Reserves-Areas of Critical Environmental Concern			
Not Applicable, Excluded from Table			
Land Use Allocations — District-Designated Reserves – Timber Production Capability Classification			
Management Direction			
Manage areas identified as unsuitable for sustained-yield timber production through the Timber Production Capability Classification system, for other uses if those uses are compatible with the reason for which the BLM has reserved these lands.	P	P,B	EIS Sec. 4.2.2 & 4.2.3 POD Att. I
Maintain access to roads to facilities by removing hazard trees and blowdown. Such logs may be retained as down woody material, moved for placement in streams for fish habitat restoration, or removed through a commercial harvest or special forest products sale.	C, R, O	P, B	EIS Sec. 2.1.2 EIS Sec. 2.6.2 EIS Sec. 4.7.3 EIS Sec. 4.10.3 POD Att. I POD Att. Y
Apply silviculture or fuels treatments, including prescribed fire, that restore or maintain community-level structural characteristics, promote desired species composition, and emulate ecological conditions produced by historic fire regimes, in areas identified as unsuitable for sustained-yield timber production.	N		
Designate additional lands as District-Designated Reserve – Timber Production Capability Classification through updates to the Timber Production Capability Classification system and remove those lands from the Harvest Land Base when examinations indicate that those lands meet the criteria for reservation.	N		
Un-designate lands as District-Designated Reserve – Timber Production Capability Classification and return those lands to Harvest Land Base through updates to the Timber Production Capability Classification system and remove those lands from the Harvest Land Base when examinations indicate that those lands do not meet the criteria for reservation.	N		

TABLE 1.1-1

Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	Applicability	Consistency	EIS Section
Land Use Allocations — District-Designated Reserves-Lands Managed for their Wilderness Characteristics			
Not Applicable, Excluded from Table			
Land Use Allocations — Harvest Land Base			
Management Objectives			
Manage forest stands to achieve continual timber production that can be sustained through a balance of growth and harvest.	N		
Offer for sale the declared Allowable Sale Quantity of timber.	N		
Recover economic value from timber following disturbances, such as fires, windstorms, disease, or insect infestations.	N		
In harvested or disturbed areas, ensure the establishment and survival of desirable trees appropriate to the site and enhance their growth.	R	P, B	POD Att. I POD Att. P
Enhance the economic value of timber in forest stands.	N		
Management Direction			
Conduct silviculture treatments to contribute timber volume to Allowable Sale Quantity.	N		
Conduct silviculture treatments to enhance timber values and to reduce fire risks and insect and disease outbreaks.	N		
Conduct regeneration harvest for reasons including attainment of Allowable Sale Quantity, age class distribution, insect and disease infestations, change primarily hardwood stands to a mix of conifer and hardwood species, increase species diversity, restore and maintain habitat for Bureau Special Status Species, growing space for hardwoods, produce complex early-successional ecosystems, reset stand development in overly dense stands.	N		
Conduct commercial thinning for reasons including attainment of Allowable Sale Quantity, adjust stand composition, reduce stand susceptibility to issues like wildlife and disease, improve stand merchantability, increase species diversity, promote stand complexity, create growing space for Bureau Special Status plants, create growing space for hardwoods and pines.	N		
Maintain stand densities through commercial thinning to promote stand vigor and health, as specified in the RMP.	N		
During commercial harvest, except timber salvage, and except for safety, operational, or fuels reduction reasons, retain existing snags and down woody material as specified in the RMP.	N		
When implementing commercial harvest, except timber salvage, in stands with less than 26 snags per acre over 10 inches DBH and less than 8 snags per acre over 20 inches DBH on average across the harvest unit, create new snags within 1 year of completion to the specifications described in the RMP.	N		

TABLE 1.1-1

Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	Applicability	Consistency	EIS Section
Employ site preparation methods such as mechanical treatments, manual treatments, and prescribed burns to prepare newly harvested and inadequately stocked areas for regeneration of desirable tree species.	N		
Manually apply supplemental nutrients where necessary to enhance vigor and growth of desired vegetation. Do not use aerial application methods.	R	P, B	EIS Sec. 4.4.1 POD Att. I
If not suitable for commercial removal, allow cut hazard trees to be available for habitat restoration purposes in any land use allocation, including off-site from the location where such hazard trees are cut.	C, R, O	P, B	EIS Sec. 4.4.2 POD Att. I POD Att. U
Where trees are cut for yarding corridors, skid trails, road construction, maintenance, and improvement, retain cut trees in adjacent stands as down woody material, move cut trees for placement in streams for fish habitat restoration, or sell trees at the discretion of the BLM. For trees of a certain age or size as described in the RMP keep as down woody material in adjacent stands.	C, R, O	P, B,	EIS Sec. 4.4.2 POD Att. I POD Att. U
Where trees are cut for right-of-way permits, retain cut trees in adjacent stands as down woody material, move cut trees for placement in streams for fish habitat restoration, or sell trees to the right-of-way permittee, at the discretion of the BLM and consistent with valid existing rights. For trees of a certain age or size as described in the RMP keep as down woody material in adjacent stands.	C, R, O	P, B	EIS Sec. 4.4.2 POD Att. I POD Att. U
Land Use Allocations — Harvest Land Base – Low Intensity Timber Area (LITA)			
Not Applicable, Excluded from Table			
Land Use Allocations — Harvest Land Base – Moderate Intensity Timber Area (MITA)			
Not Applicable, Excluded from Table			
Land Use Allocations — Late-Successional Reserve			
Management Objective			
Maintain nesting-roosting habitat for the northern spotted owl and nesting habitat for the marbled murrelet.	P, C, R,O	A	Amendment-District Designated Reserve EIS Section 2.1.3.1
Promote the development of nesting-roosting habitat for northern spotted owl in stands that do not currently support northern spotted owl nesting and roosting.	N		
Promote the development of nesting habitat for the marbled murrelet in stands that do not currently meet nesting habitat criteria.	N		
Promote the development and maintenance of foraging habitat for the northern spotted owl, including creating and maintaining habitat to increase diversity and abundance of prey for the northern spotted owl.	N		

TABLE 1.1-1

Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	Applicability	Consistency	EIS Section
Management Direction			
Manage for large blocks of northern spotted owl nesting-roosting habitat that supports clusters of reproducing spotted owls, are distributed across the variety of ecological conditions, and are spaced to facilitate the movement and survival of spotted owls dispersing between and through the blocks.	N		
In stands that are currently northern spotted owl nesting-roosting habitat, maintain nesting-roosting habitat function, regardless of northern spotted owl occupancy.	P, C, R, O	A	Amendment-District Designated Reserve EIS Section 2.1.3.1
Protect stands of older, structurally-complex conifer forest. Such stands are a subset of, and represent the highest value, northern spotted owl nesting-roosting habitat.	P	A	Amendment-District Designated Reserve EIS Section 2.1.3.1
Undertake activities such as individual tree removal, including the felling of hazard trees and stream logs, and the construction of linear and non-linear rights-of-way or other facilities, including communication sites, as long as northern spotted owl nesting-roosting habitat continues to support northern spotted owl nesting and roosting at the stand level and supports dispersal movements.	P C, R, O	A	Amendment-District Designated Reserve EIS Section 2.1.3.1
Protect marbled murrelet occupied stands. Prohibit activities in occupied stands except the activities described in the RMP which includes restoration and rights-of-way construction or maintenance as long as stands continue to support marbled murrelet nesting.	P, C, R, O	A	Amendment-District Designated Reserve EIS Section 2.1.3.1
During silviculture treatment of stands retain existing snags and down woody material to the specifications described in the RMP.	N		
Cut or tip individual live trees and move for placement in streams for fish habitat restoration.	N		
Do not conduct timber salvage, except when necessary to protect public safety, or to keep roads and other infrastructure clear of debris.	C, R, O	P, B	EIS Sec. 4.4.2 POD Att. I POD Att. U
Maintain access to roads and facilities by removing hazard trees and blowdown. Such logs may be retained as down woody material, moved for placement in streams for fish habitat restoration, or removed through a commercial harvest or special forest products sale.	C, R, O	P, B	EIS Sec. 2.1.2 EIS Sec. 2.6.2 EIS Sec. 4.4.2 EIS Sec. 4.10.3 POD Att. I POD Att. U POD Att. Y
Where trees are cut for yarding corridors, skid trails, road construction, maintenance, and improvement, retain cut trees in adjacent stands as down woody material, move cut trees for placement in streams for fish habitat restoration, or sell trees, at the discretion of the BLM. Retain large or old trees as down woody material as specified in the RMP.	C, R, O	P, B	EIS Sec. 2.1.2 EIS Sec. 2.6.2 EIS Sec. 4.4.2 POD Att. I POD Att. U POD Att. Y

TABLE 1.1-1

Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	**Applicability**	**Consistency**	**EIS Section**
Where trees are cut for rights-of-way permits, retain cut trees in adjacent stands as down woody material, move cut trees for placement in streams for fish habitat restoration, or sell trees to the right-of-way permittee, at the discretion of the BLM and consistent with valid existing rights. Retain large or old trees as down woody material as specified in the RMP.	C, R, O	P, B	EIS Sec. 2.1.2 EIS Sec. 2.6.2 EIS Sec. 4.4.2 POD Att. I POD Att. U POD Att. Y
In stands that are not northern spotted owl nesting-roosting habitat, apply silviculture treatments to speed the development of northern spotted owl nesting-roosting habitat or improve the quality of northern spotted owl nesting-roosting habitat in the stand or in the adjacent stand in the long term. Limit silviculture treatments as specified in the RMP.	N		
Utilize integrated vegetation management in designing and implementing treatments. Conducted integrated vegetation management for the reasons specified in the RMP.	N		
In stands ≥ 10 acres treated with selection harvest or commercial thinning, conduct harvest and do not create group selection openings as specified in the RMP.	N		
In stands < 10 acres treated with selection harvest or commercial thinning, do not create group selection openings more than 2.5 acres in size.	N		
Use natural or artificial regeneration or both to reforest group selection openings created from selection harvest or commercial thinning with a mixture of species appropriate to the site to an average density across the group selection openings of at least 75 trees per acre within 5 years of harvest.	N		
When conducting commercial harvest, in stands with less than 64 snags per acre > 10” DBH and less than 19 snags per acre > 20” DBH on average across the harvest unit, create new snags as specified in the RMP within 1 year of completion of yarding the timber in the timber sale.	N		
When conducting fuels reduction or prescribed fire treatments, retain down woody material at levels specified in the RMP. Meet down wood levels as an average at the scale of the treatment area following the treatment.	N		
Land Use Allocations — Riparian Reserve			
Management Objectives			
Contribute to the conservation and recovery of ESA-listed fish species and their habitats and provide for the conservation of Bureau Special Status fish and other Bureau Special Status riparian-associated species.	P, R	P, B,	EIS Sec. 1.5 EIS Sec. 4.5.2 EIS Secs. 4.6.1-4.6.5 EIS Sec. 4.7.3 POD Att. L

TABLE 1.1-1

Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	Applicability	Consistency	EIS Section
Maintain and restore natural channel dynamics, processes, and the proper functioning condition of riparian areas, stream channels, and wetlands by providing forest shade, sediment filtering, wood recruitment, stream bank and channel stability, water storage and release, vegetation diversity, nutrient cycling, and cool and moist microclimates.	P, R	P, B	EIS Sec. 1.5 EIS Sec. 2.4.2 EIS Secs. 4.3.2, 4.3.3 & 4.3.4 EIS Sec. 4.5.2 EIS App. H POD Att. I POD Att. BB
Maintain water quality and streamflows within the range of natural variability, to protect aquatic biodiversity, provide quality water for contact recreation and drinking water sources.	P, R	P, B	EIS Sec. 1.5 EIS Sec. 2.4.2 EIS Secs. 4.3.2, 4.3.3 & 4.3.4 EIS Sec. 4.5.2 EIS App. H POD Att. I POD Att. BB
Meet Oregon Department of Environmental Quality (ODEQ) water quality criteria. (Note: This is a requirement of the RMP however compliance is the responsibility of the proponent who must secure a Clean Water Act Section 401 permit from the State of Oregon as a condition of the Right of Way Grant...)	P, C, R	P, B	EIS Sec. 1.5 EIS Sec. 2.4.2 EIS Secs. 4.3.2, 4.3.3 & 4.3.4 EIS Sec. 4.5.2 EIS App. H POD Att. I POD Att. BB
Maintain high quality water and contribute to the restoration of degraded water quality for 303(d)-listed streams.	P, R	P, B	EIS Sec. 1.5 EIS Sec. 2.4.2 EIS Secs. 4.3.2, 4.3.3 & 4.3.4 EIS Sec. 4.5.2 EIS App. H POD Att. I POD Att. BB
Maintain high quality waters within ODEQ-designated Source Water Protection watersheds.	P, R	P, B	EIS Sec. 1.5 EIS Sec. 2.4.2 EIS Secs. 4.3.2, 4.3.3 & 4.3.4 EIS Sec. 4.5.2 EIS App. H POD Att. I POD Att. BB

TABLE 1.1-1

Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	Applicability	Consistency	EIS Section
Management Direction			
Prohibit timber salvage, except when necessary to protect public safety, or to keep roads and other infrastructure clear of debris.	O	P, B	EIS Sec. 2.4.2 EIS Sec. 4.4.2 EIS Sec. 4.10.2 EIS App. I POD Att. P POD Att. Y
Maintain access to roads and facilities by removing hazard trees and blowdown from roads and facilities. Retain such logs as down woody material within adjacent stands or move for placement in streams for fish habitat restoration, unless removal of logs, including through commercial harvest, is necessary to maintain access to roads and facilities.	C, R, O	P, B	EIS Sec. 2.4.2 EIS Sec. 4.4.2 EIS Sec. 4.10.2 EIS App. I POD Att. P POD Att. Y
Allow yarding corridors, skid trails, road construction, stream crossings, and road maintenance and improvement where there is no operationally feasible and economically viable alternative to accomplish other resource management objectives.	P, C, O	P, B	EIS Sec. 2.4.2 EIS Sec. 4.4.2 EIS Sec. 4.10.2 EIS App. I POD Att. P POD Att. Y
Where trees are cut for yarding corridors, skid trails, road construction, maintenance, and improvement in the Inner Zone or Middle Zone, retain cut trees in adjacent stands as down woody material or move cut trees for placement in streams for fish habitat restoration, at the discretion of the BLM. In the Outer Zone or in Riparian Reserves with non-stream features retain cut trees as described above or sell trees at the discretion of the BLM. For large or old trees retain as down woody material as described in the RMP.	C, R	P, B	EIS Sec. 2.4.2 EIS Sec. 4.4.2 EIS Sec. 4.10.2 EIS App. I POD Att. P POD Att. Y
Where trees are cut for right-of-way permits in the Inner Zone, Middle Zone, retain cut trees in adjacent stands as down woody material or move cut trees for placement in streams for fish habitat restoration. In the Outer Zone keep as down woody material, place in streams for fish habitat, or sell to right-of-way permittee at discretion of BLM and with valid existing rights. For large and old trees retain as described in the RMP.	C, R	P, B	EIS Sec. 2.4.2 EIS Sec. 4.4.2 EIS Sec. 4.10.2 EIS App. I POD Att. P POD Att. Y
Use site-specific BMPs to maintain water quality during land management actions, including discretionary actions of other crossing BLM-administered lands.	C,R	P, B	POD Att. I POD Att. X POD Att. BB
In new recreational developments, install sanitation systems that maintain water quality.	N		
Do not operate ground-based machinery for timber harvest within 50 feet of stream, except where machinery is on improved roads, designated stream crossings, or where equipment entry into the 50-foot zone would not increase the potential for sediment delivery into the stream.	N		
Do not operate ground-based machinery for timber harvest on slopes > 35 percent. See RMP for exceptions for machinery with tracks.	N		

TABLE 1.1-1

Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	Applicability	Consistency	EIS Section
During silviculture treatment of stands, retain existing snags and down woody material as specified in the RMP.	N		
Implement sudden oak death (SOD) eradication activities that do not exceed canopy cover specifications or amounts as specified in the RMP.	N		
Cut or tip individual live trees and move for fish habitat restoration.	N		
Cut or tip individual live trees directly into the stream channel for fish habitat restoration.	N		
Tree tipping: when conducting commercial thinning in any portion of the Outer Zone in a stand in all watershed classes, cut or tip from 0 to 15 square feet of basal area per acre of live trees, averaged across the Riparian Reserve portion of the treated stand. Leave cut or tipped trees on site as specified in the RMP.	N		
Promote beaver habitat restoration where the presence of beaver and their associated dams would improve fish and aquatic habitat.	R	P, B	EIS Sec. 4.5.1
Along ponds and wetlands < 1 acre and constructed water impoundments of any size, treat vegetation as needed for habitat restoration, access, or safety.	C, R	P, B	EIS Sec. 2.4.2 EIS Secs. 4.3.2, 4.3.3 & 4.3.4 EIS Sec. 4.5.2 EIS App. H POD Att. I POD Att. BB
For constructed water impoundments and constructed ponds, follow inspection guidelines, dredge as necessary, and maintain vegetation, access, and plumbing as specified in the RMP.	N		
Riparian Reserve distances vary depending on intermittency of streams, bearing of fish, and size of wetlands. See RMP for Riparian Reserves distance calculations.	P	P, B, R	EIS Secs. 4.3.2 & 4.3.3 EIS App. H POD Att. BB
For fish-bearing and perennial streams in the Inner Zone do not thin stands except as specified in the RMP.	N		
For fish-bearing and perennial streams in the Outer Zone thin stands as needed to provide trees that would function as stable wood in the stream. Maintain canopy cover and density as specified in the RMP.	N		
For intermittent, non-fish-bearing streams, do not thin stands in the Inner Zone except as specified in the RMP.	N		
For intermittent, non-fish-bearing streams, thin stands as needed in the Middle Zone and Outer Zone as needed to provide trees that would function as stable wood in the stream. Maintain canopy cover and density as specified in the RMP.	N		

TABLE 1.1-1

Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	Applicability	Consistency	EIS Section
Land Use Allocations — Administrative Actions			
Not Applicable, Excluded from Table			
Resource Programs — Air Quality			
Management Objectives			
Protect air quality related values in Federal mandatory Class I areas.	P	P, B	EIS Sec. 1.5 EIS Sec. 4.12.1 POD Att. B
Prevent exceedances of National, State, or local ambient air quality standards.	C, R, O	P, B	EIS Sec. 1.5 EIS Sec. 4.12.1 POD Att. B
Management Direction			
Comply with the Oregon Smoke Management Plan when implementing prescribed burning activities.	C	P, B	EIS Sec. 1.5 EIS Sec. 4.12.1 POD Att. B POD Att. R
Use BMPs to reduce dust from unpaved road surfaces during extended management operations, such as timber sales and wildfire management actions/activities.	C, R, O	P, B	EIS Sec. 1.5 EIS Sec. 4.12.1 POD Att. B
Follow State Implementation Plan requirements for activities that could negatively affect the status of air quality non-attainment or maintenance areas.	P, C, R,0	P, B	EIS Sec. 1.5 EIS Sec. 4.12.1 POD Att. B
Resource Programs — Cultural Resources			
Management Objectives			
Preserve and protect significant cultural resources and ensure that they are available for appropriate uses by present and future generations.	P, C	P, B,	EIS Secs. 4.11.1-4.11.3 POD Att. Z
Reduce imminent threats and resolve potential conflicts from natural or human-caused deterioration or potential conflict with other resources by ensuring that all authorizations for land and resource use comply with Section 106 of the National Historic Preservation Act.	P	R	EIS Secs. 4.11.1-4.11.5 POD Att. Z
Management Direction			
Evaluate all documented cultural resources for National Register of Historic Places eligibility. For all sites that are listed or eligible for listing on the National Register of Historic Places, protect sites through avoidance or other protection measures.	P, C	P, B	EIS Secs. 4.11.1-4.11.3 POD Att. Z
Conduct public education and outreach activities and develop materials in order to educate and interpret for the public the cultural and historic resources within the decision area.	N		
Assign all cultural resources into one of the use allocations specified in the RMP.	N		

TABLE 1.1-1

Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	Applicability	Consistency	EIS Section
Resource Programs — Fire, Fuels, and Wildfire Response			
Management Objective			
Respond to wildfires in a manner that provides for public and firefighter safety while meeting land management objectives by utilizing the full range of fire management options.	N		
Fire management strategies would be risk-based decisions that consider firefighter and public safety, values at risk, management objectives, and costs that are commensurate with the identified risk.	N		
Actively manage the land to restore and maintain resilience of ecosystems to wildfire and decrease the risk of uncharacteristic, large, high-intensity/high-severity wildfires.	N		
Manage fuels to reduce wildfire response consistent with the National Cohesive Wildland Fire Management Strategy.	N		
Participate with communities bordering Federal lands in partnership with local, State, and Federal stakeholders to reduce risks and threats from wildland fire.	N		
Management Direction			
Take immediate action to suppress all unplanned human-caused ignitions at the lowest cost commensurate with the protection of firefighter and public safety and welfare and resulting in the fewest negative consequences to natural and cultural resources.	C, R, O	P, B	EIS Secs. 4.4.1 & 4.4.2 POD Att. K
Allow application of the full range of fire management options in responding to natural ignitions or escaped prescribed fires. These fires may be used to achieve management objectives as specified in the RMP.	N		
Conduct wildfire rehabilitation and restoration actions to protect and sustain ecosystems, ecosystem services, public health and safety, and infrastructure adversely affected by fire management operations or direct fire effects.	N		
Treat both management activity fuels and natural hazardous fuels for any of the reasons specified in the RMP such as reducing potential fire behavior.	N		
Treat fuels in a way that increase intervals between future maintenance treatments.	N		
Create fuel beds or fuel breaks that reduce potential for high-intensity/high-severity fire spread within the wildland urban interface or in close proximity to highly valued resources.	N		
Prior to applying prescribed fire, take necessary mitigation actions to reduce impacts to Bureau Special Status Species wildlife and plants and their habitats.	N		
Conduct necessary vegetation maintenance treatments to ensure that fire management operations are able to access existing natural and human-made strategic infrastructure.	N		

TABLE 1.1-1

Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	**Applicability**	**Consistency**	**EIS Section**
Resource Programs — Fisheries			
Management Objectives			
Improve the distribution and quantity of high-quality fish habitat across the landscape for all life stages of ESA-listed, Bureau Special Status Species, and other fish species.	N		
Maintain and restore access to stream channels for all life stages of aquatic species.	P, C, R, O	P, B,	EIS Sec. 1.5 EIS Sec. 4.3.2 EIS Sec. 4.5.2 EIS Secs. 4.6.1-4.6.5 EIS App. H POD Att. L POD Att. BB
Management Direction			
Restore degraded spawning, rearing, and holding habitat for fish using a combination of accepted techniques including but not limited to log and boulder placement in stream channels, tree tipping, and gravel enhancement.	P, R	P, B,	EIS Sec. 1.5 EIS Sec. 4.3.2 EIS Sec. 4.5.2 EIS Secs. 4.6.1-4.6.5 EIS App. H POD Att. L POD Att. BB
Remove or modify human-caused fish passage barriers to restore access to stream channels for all life stages for native aquatic species.	P, R	P, B,	EIS Sec. 1.5 EIS Sec. 4.3.2 EIS Sec. 4.5.2 EIS Secs. 4.6.1-4.6.5 EIS App. H POD Att. L POD Att. BB
Resource Programs — Forest Management			
Management Objectives			
Enhance the health, stability, growth, and vigor of forest stands.	N		
In harvested or disturbed areas, ensure the establishment and survival of desired vegetation appropriate to the site.	N		
Facilitate safe and efficient forestry operations for the BLM, reciprocal right-of-way agreement holders, and permittees.	N		

TABLE 1.1-1

Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	**Applicability**	**Consistency**	**EIS Section**
Management Direction			
Promote the establishment and survival of desirable vegetation through stand maintenance treatments.	N		
Apply thinning or prescribed fire to forest stands as needed to achieve appropriate stocking and density levels.	N		
Use genetically improved native trees for reforestation when available.	R	P, B	EIS Sec. 4.4.2 POD Att. I POD Att. U
Fall and move live or dead trees as needed for safety or operational reasons, including but not limited to, the creation of landings, yarding corridors, or skid trails within or adjacent to nearby harvest units, hazard tree removal, and road construction, improvement, or maintenance.	C, R, O	P, B	EIS Sec. 2.4.2 EIS Sec. 4.4.2 EIS App. I POD Att. P POD Att. U
Allow road construction, maintenance, improvement, and decommissioning as well as construction of skid trails and yarding corridors based on operational needs and consistent with valid existing rights.	P, C, R, O	P, B	EIS Sec. 4.10.2 POD Att. Y
Allow management activities in density management study sites that are compatible with study objectives.	N		
Resource Programs — Hydrology			
Management Objectives			
Maintain water quality within the range of natural variability that meets ODEQ water quality standards for drinking water, contact recreation, and aquatic biodiversity.	P, C, O	P, B,	EIS Sec. 1.5 EIS Secs. 4.3.1-4.3.4 EIS Sec. 4.5.2 POD Att. BB
Management Direction			
Select and implement site-level BMPs to maintain water quality for BLM actions and discretionary actions of others crossing BLM-administered lands.	P, C, R	P, B,	EIS Sec. 1.5 EIS Secs. 4.3.1-4.3.4 EIS Sec. 4.5.2 POD Att. BB
Design culverts, bridges, and other stream crossings for a 100-year flood event and for standards for ESA-listed fish and other requirements described in the RMP.	P	P, B	EIS Sec. 1.5 EIS Secs. 4.3.1-4.3.4 EIS Sec. 4.5.2 EIS Secs. 4.10.1 & 4.10.2 POD Att. Y POD Att. BB

TABLE 1.1-1

Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	Applicability	Consistency	EIS Section
Implement road improvements, storm proofing, maintenance, or decommissioning to reduce or eliminate chronic sediment inputs to stream channels and waterbodies.	P, C, R, O	P, B,	EIS Sec. 1.5 EIS Secs. 4.3.1-4.3.4 EIS Sec. 4.5.2 EIS Secs. 4.10.1 & 4.10.2 POD Att. I POD Att. Y POD Att. BB
Suspend commercial road use where the road surface is deteriorating due to vehicle rutting or standing water, or where turbid runoff is likely to reach stream channels.	P, C, R, O	P	EIS Sec. 1.5 EIS Secs. 4.3.1-4.3.4 EIS Sec. 4.5.2 EIS Secs. 4.10.1 & 4.10.2 POD Att. I POD Att. Y POD Att. BB
Decommission roads that are no longer needed for resource management and are at risk of failure for are contributing sediment to streams, consistent with valid existing rights.	N		
Resource Programs — Invasive Species			
Management Objectives			
Prevent the introduction of invasive species and the spread of existing invasive species infestations.	C, R, O	P, B	EIS Secs. 4.5.1 & 4.5.2 POD Att. N POD Att. W
Prevent the introduction and spread of sudden oak death infestations.	C, R, O	P, B	EIS Secs. 4.5.1 & 4.5.2 EIS App. I POD Att. N POD Att. W
Management Direction			
Implement measures to prevent, detect, and rapidly control new invasive species infestations.	P, C, R, O	P, B	EIS Secs. 4.5.1 & 4.5.2 EIS App. I POD Att. N POD Att. W
Use manual, mechanical, cultural, chemical, and biological treatments to manage invasive species infestations.	C, R, O	P, B	EIS Secs. 4.5.1 & 4.5.2 EIS App. I POD Att. I POD Att. N POD Att. W

TABLE 1.1-1

Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	Applicability	Consistency	EIS Section
Treat invasive plants and host species for invasive forest pathogens in accordance with the Records of Decision for the Northwest Area Noxious Weed Control Program Environmental Impact Statement and the Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in Oregon Environmental Impact Statement.	C, R, O	P, B	EIS Sec. 1.5 EIS Sec. 4.4.1 EIS App. I POD Att. N POD Att. W
Apply state-of-the-art, integrated pest management prescriptions for the treatment of all identified sudden oak death infection sites.	C, R, O	P, B	EIS Secs. 4.5.1 & 4.5.2 EIS App. I POD Att. N POD Att. W
Resource Programs — Lands, Realty, and Roads			
Management Objectives			
Make land tenure adjustments to facilitate the management of resources and enhance public resource values.	N		
Provide legal access to BLM-administered lands and facilities to support resource management programs.	N		
Provide needed rights-of-way, permits, leases, and easements over BLM-administered lands in a manner that is consistent with Federal and State laws.	P	P	EIS Sec. 1.5 EIS Sec. 2.1.3 POD Att. Y
Protect lands that have important resource values or substantial levels of investment by withdrawing them, where necessary, from the implementation of nondiscretionary public land and mineral laws.	N		
Provide a road transportation system that serves resource management needs and casual use needs for both BLM-administered lands and adjacent privately owned lands.	N		
Management Direction			
Retain lands in Land Tenure Zone 1 (Zone 1) under BLM administration. Lands in Zone 1 including areas as specified in the RMP.	N		
Make lands in Land Tenure Zone 2 (Zone 2) available for exchange to enhance public resource values, improve management capabilities, or reduce the potential for land use conflict. Lands in Zone 2 are not in the other two Zone categories.	N		
Make lands in Land Tenure Zone 3 (Zone 3) available for disposal using appropriate disposal mechanisms. Lands in Zone 3 include those as specified in the RMP.	N		
Assign to Zone 3 survey hiatuses and unintentional encroachments discovered in the future.	N		
Assign to Zone 3 patented lands with reversionary interests reserved by the United States that are relinquished back to Federal ownership.	N		

TABLE 1.1-1

Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	Applicability	Consistency	EIS Section
Assign to Zone 3 land boundary adjustments due to river movement discovered in the future, which meets the disposal criteria defined in the RMP.	N		
The BLM may dispose of lands designated in Zones 2 and 3 that provide habitat for ESA-listed species, including critical habitat, only following consultation with the U.S. Fish and Wildlife Service or National Marine Fisheries Services and upon a determination that such action is consistent with relevant law and maximizes public resource values.	N		
As required by the Oregon Public Lands Transfer and Protection Act, do not reduce through disposal, exchange, or sale the acres of O&C lands of all classifications, and the acres of O&C and public domain lands that are available for harvesting.	N		
Acquire or dispose of lands to facilitate resource management objectives as opportunities occur. See the Land Tenure Adjustment Criteria section in the RMP.	N		
Make available for disposal the public domain lands in Zones 2 and 3 that have been classified under Section 7 of the Taylor Grazing Act.	N		
Manage newly acquired lands for the purpose for which they were acquired or in a manner that is consistent with management objectives for adjacent BLM-administered lands or other BLM-administered lands having similar resource values.	N		
Where the BLM has administrative responsibility on lands managed by other agencies, the BLM will administer those lands in accordance with interagency agreements.	N		
Issue permits, as identified under the FLPMA for a variety of uses, such as, but not limited to, stockpile and storage sites and as tools to authorize unintentional trespass situations pending final resolution.	N		
Do not use land use authorizations for landfills or other waste disposal facilities.	N		
Use land-use authorizations to resolve agricultural or occupancy trespasses, where appropriate.	N		
Recognize existing rights-of-way, permits, leases, and easements as valid uses.	P, C, R, O	P, R	EIS Sec. 4.10.2 POD Att. Y
Limit withdrawals to the area needed and restrict only those activities needed to accomplish the purposes of the withdrawal.	N		
Process formal land withdrawals being relinquished by the BLM or other Federal agency according to the procedures stated under 43 CFR 2372.	N		
Right-of-way exclusion areas include those as described in the RMP such as Wilderness Study Areas and lands designated as Wilderness.	P	P, B, R	EIS Secs. 4.7.1-4.7.3 POD Att. T

TABLE 1.1-1

Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	**Applicability**	**Consistency**	**EIS Section**
Right-of-way avoidance areas include those as described in the RMP such as Areas of Critical Environmental Concern and Recreation Management Areas. Only grant right-of-way in avoidance areas if values for which the land was designated are maintained and there are no feasible alternatives.	P	P, B, R	EIS Secs. 4.7.1-4.7.3 POD Att. T
Grant rights-of-way in utility corridors as the preferred location for energy transmission or distribution facilities. Corridors would generally be 1,000 feet on each side of the centerline. Do not conflict with existing utility corridors.	P	P, R	EIS Sec. 1.5 EIS Secs. 4.7.1-4.7.3
Construct communication facilities on existing developed communication sites where they do not conflict with other management objectives. Require a site plan for applications for communication facilities on undeveloped communication sites.	P	P	EIS Sec. 1.5 EIS Secs. 4.7.1-4.7.3 POD Att. D
Expand existing communication sites and develop new sites. Prioritize the use of existing sites and facilities for accommodating the need for additional capacity.	P	P	EIS Sec. 1.5 EIS Secs. 4.7.1-4.7.3 POD Att. D
Construct new permanent or temporary roads, which may include major culverts and bridges, where needed to meet resource management objectives, to established BLM engineering designs standards and apply BMPs.	P, C	P, B	EIS Sec. 4.10.2 POD Att. Y
Maintain existing roads, including major culverts and bridges, to provide access for both resource management and casual use activities while protecting water quality and facility investments, and providing user safety, to established BLM maintenance standards and apply BMPs.	C, O	P, B	EIS Secs. 4.10.1-4.10.3 POD Att. Y
Remove hazard and downed trees along roads for safety or operational reasons.	C, O	P, B	EIS Sec. 4.4.2 POD Att. I POD Att. U
Fully decommission or obliterate roads with no future resource management need. Decommission roads not currently needed for resource management but that will be used and maintained again in the future and apply BMPs.	N		
Resource Programs — Livestock Grazing			
Not Applicable, Excluded from Table			
Resource Programs — Minerals			
Not Applicable, Excluded from Table			
Resource Programs — Leasable Minerals: Oil, Gas, or Coalbed Natural Gas Resource			
Not Applicable, Excluded from Table			
Resource Programs — Locatable Minerals			
Not Applicable, Excluded from Table			

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Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	**Applicability**	**Consistency**	**EIS Section**
Resource Programs — Salable Minerals			
Not Applicable, Excluded from Table			
Resource Programs — Paleontological Resources			
Management Objectives			
Protect and preserve significant localities from natural or human-caused deterioration or potential conflict with other resources.	P, C	P, B,	EIS Secs. 4.11.1-4.11.3 POD Att. Z
Provide appropriate scientific, educational, and recreational uses, such as research and interpretive opportunities, for paleontological resources.	N		
Management Direction			
Protect all paleontological resources through avoidance or other protection measures, consistent with BLM Handbook 8270-1.	P, C	P, B,	EIS Secs. 4.11.1-4.11.3 POD Att. Z
Conduct public education, outreach activities, and develop materials to educate the public on paleontological resources existing within the decision area.	N		
Resource Programs — Rare Plants and Fungi			
Management Objectives			
Provide for conservation and contribute toward the recovery of plant species that are ESA-listed or candidates.	P	P, B	EIS Secs. 4.6.1-4.6.5 EIS App. I POD Att. J
Support the persistence and resilience of natural communities, including those associated with forests, oak woodlands, shrublands, grasslands, cliffs, rock outcrops, talus slopes, meadows, and wetlands.	P	P, B	EIS Sec. 4.4.1 POD Att. I
Provide for the conservation of Bureau Special Status plant and fungi species.	P	P, B	EIS Secs. 4.6.1-4.6.5 EIS App. I POD Att. J
Support the persistence and resilience of oak species within oak woodlands and within mixed hardwood/conifer communities.	P	P, B	EIS Sec. 4.4.1 POD Att. I
Management Direction			
Manage ESA-listed species consistent with recovery plans, conservation agreements, species management plans, and designated critical habitat and species-specific or project-specific conservation measures developed with USFWS such as habitat protection and action intensity reduction to recover species populations.	P	P, B, R	EIS Sec. 4.6.1-4.6.4 EIS App. I POD Att. J

TABLE 1.1-1

Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	Applicability	Consistency	EIS Section
Manage ESA candidate and Bureau Sensitive species consistent with any conservation agreements or strategies including the protection and restoration of habitat, alteration of the type, timing, and intensity of actions, and other strategies designed to conserve populations of the species.	P	P, B, R	EIS Sec. 4.6.1-4.6.4 EIS App. I POD Att. J
Manage habitat to maintain populations of ESA-listed, proposed, and candidate plant species.	P	P, B, R	EIS Sec. 4.6.1-4.6.4 EIS App. I POD Att. J
Prior to implementing actions that could result in habitat modifications or species disturbance in the suitable habitat of any ESA-listed, proposed, or candidate plant species, or Bureau Sensitive plant species, conduct surveys to determine species presence. Use information on known sites and other details as specified in the RMP.	P	P, B	EIS Sec. 1.5 EIS Secs. 4.6.1-4.6.5 EIS App. I POD Att. J
Maintain or restore natural processes, native species composition, and vegetation structure in natural communities through actions such as applying prescribed fire, thinning, removing encroaching vegetation, and other actions described in the RMP.	N		
When re-vegetating degraded or disturbed areas, utilize locally adapted seeds and native plant materials as specified in the RMP.	R	P, B	EIS Sec. 4.4.1 POD Att. I
Manage mixed hardwood/conifer communities to maintain and enhance oak persistence and structure by removing competing conifers, thinning, and prescribed fire, to the extent consistent with management direction for the land use allocation.	N		
Manage mixed conifer communities to maintain and enhance ponderosa, Jeffrey, and sugar pine persistence and structure by removing competing conifers, thinning, and prescribed fire, to the extent consistent with management direction for the land use allocation.	N		
Create new and augment existing populations of ESA-listed, proposed, and candidate plant species and Bureau Sensitive plant and fungi species to meet recovery plan or conservation objectives.	N		
Resource Programs — Recreation and Visitor Services			
Not Applicable, Excluded from Table			
Recreation and Visitor Services-Significant Caves			
Not Applicable, Excluded from Table			
Resource Programs — Soil Resources			
Management Objectives			
Maintain or enhance the inherent soil functions of managed ecosystems.	N		
Provide landscapes that stay within natural soil stability failure rates during and after management activities.	N		

TABLE 1.1-1

Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	**Applicability**	**Consistency**	**EIS Section**
Management Directions			
Apply BMPs as needed to maintain or restore soil functions and soil quality and limit detrimental soil disturbance.	C, R, O	P, B	EIS Secs. 4.2.1-4.2.3 EIS App. G POD Att. I
Limit detrimental soil disturbance from forest management operations to less than 20 percent of the harvest unit area and apply mitigation if this is exceeded.	N		
Avoid road construction and timber harvest on unstable slopes where there is a high probability to cause a shallow, rapidly moving landslide that would likely damage infrastructure or threaten public safety.	P, C	P, B	EIS Sec. 2.4.2 EIS Sec. 4.1.2 EIS Sec. 4.2.2 EIS Sec. 4.4.2
Do not till soils where tillage will cause soils to become unstable due to increasing the soil moisture content.	R	P, B	EIS Secs. 4.2.1-4.2.3 EIS App. G POD Att. I
Resource Programs — Sustainable Energy			
Not Applicable, Excluded from Table			
Resource Programs — Sustainable Energy-Biomass Energy Development			
Not Applicable, Excluded from Table			
Resource Programs — Sustainable Energy-Wind Energy Development			
Not Applicable, Excluded from Table			
Resource Programs — Sustainable Energy-Geothermal Energy Development			
Not Applicable, Excluded from Table			
Resource Programs — Sustainable Energy-Sustainable Energy Transmission Corridors			
Not Applicable, Excluded from Table			
Resource Programs — Trails and Travel Management			
Not Applicable, Excluded from Table			
Resource Programs — Visual Resource Management			
Management Objectives			
Protect scenic values on public lands where visual resources are an issue or where high-value visual resources exist.	P	R	EIS Sec. 1.5 EIS Sec. 2.4.2 EIS Sec. 4.8.2 EIS App. K

TABLE 1.1-1

Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	Applicability	Consistency	EIS Section
Prohibit activities that would disrupt the existing character of the landscape in Visual Resource Management Class I areas.	P	R	EIS Sec. 1.5 EIS Sec. 2.4.2 EIS Sec. 4.8.2 EIS App. K
Retain the existing character of the landscape in Visual Resource Management Class II areas.	P	R	EIS Sec. 1.5 EIS Sec. 2.4.2 EIS Sec. 4.8.2 EIS App. K
Partially retain the existing character of the landscape in Visual Resource Management Class III areas.	P	R	EIS Sec. 1.5 EIS Sec. 2.4.2 EIS Sec. 4.8.2 EIS App. K
Allow for major modification of the existing character of the landscape in Visual Resource Management Class IV areas.	P, C, R, O	P, B	EIS Sec. 1.5 EIS Sec. 2.4.2 EIS Sec. 4.8.2 EIS App. K
Management Direction			
Only allow activities that are found to meet visual resource management objectives using the Visual Resource Contrast Rating system.	P	P, B, R	EIS Sec. 1.5 EIS Sec. 2.4.2 EIS Sec. 4.8.2 EIS App. K
Visual Resource Management Class I includes areas such as Wilderness Areas and Designated Wild and Scenic Rivers (see RMP for a full list). Manage them in accordance with natural changes and prohibit activities that would lower the class.	N		
Visual Resource Management Class II includes Scenic Rivers and eligible Wild and Scenic Rivers and National Trail Management Corridors (see RMP for a full list). Manage these areas for low levels of change	N		
Visual Resource Class III includes Recreational Rivers and Special Recreation Management Areas (see RMP for full list). Manage these areas for moderate levels of change but don’t allow changes to dominate the landscape.	N		
Visual Resource Management Class IV includes all other lands not in other classes. Manage these areas for high levels of change and may dominate the landscape.	P, C, R, O	P, B	EIS Sec. 1.5 EIS Sec. 2.4.2 EIS Secs.4.8.1 & 4.8.2 EIS App. K

TABLE 1.1-1

Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	Applicability	Consistency	EIS Section
Resource Programs — Wildlife			
Management Objectives			
Conserve and recover species that are ESA-listed, proposed, or candidates, and the ecosystems on which they depend.	P	P, B	EIS Sec. 1.5 EIS Secs. 4.6.1-4.6.5 EIS App. I POD Att. J POD Att. L
Implement conservation measures that reduce or eliminate threats to Bureau Sensitive species to minimize the likelihood of and need for the ESA listing of these species.	P, C, R, O	P, B, R	EIS Sec. 1.5 EIS Secs. 4.6.1-4.6.5 EIS App. I POD Att. J POD Att. L
Conserve or create habitat for species addressed by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act and ecosystems on which they depend.	P, C, R, O	P, B, R	EIS Sec. 4.5.1 EIS Secs. 4.6.1-4.6.4 EIS App. I
Management Direction			
Manage habitat for species that are ESA-listed, or are candidates for listing, consistent with recovery plans, conservation agreements, and designated critical habitat.	P, C, R, O	P, B, R	EIS Sec. 1.5 EIS Secs. 4.6.1-4.6.5 EIS App. I POD Att. J POD Att. L
Implement conservation measures to mitigate specific threats to Bureau Sensitive species during the planning of activities and projects. Conservation measures include altering the type, timing, location, and intensity of management actions.	C, R, O	P, B, R	EIS Sec. 1.5 EIS Secs. 4.6.1-4.6.5 EIS App. I POD Att. J POD Att. L
Utilize information on known sites of ESA-listed wildlife when conducting fire management operations that could result in habitat modification or species disturbance.	N		

TABLE 1.1-1

Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	Applicability	Consistency	EIS Section
Manage naturally occurring special habitats to maintain their ecological function, such as seeps, springs, wetlands, natural ponds, vernal pools/ponds, natural meadows, rock outcrops, caves, cliffs, talus slopes, mineral licks, oak savannah, woodlands, sand dunes, and marine habitats.	P	P, B	EIS Secs. 4.3.1-4.3.4 EIS Sec. 4.4.1 EIS Secs. 4.5.1 & 4.5.2 EIS Secs. 4.6.1-4.6.5 EIS App. H EIS App. I POD Att. I POD Att. BB
Mange human-made special habitats as wildlife habitat when compatible with their engineered function, such as bridges, buildings, quarries, pump chances/heliponds, abandoned mines, and reservoirs to the extent practicable consistent with safety and legal requirements.	P, O	P, B	EIS Secs. 4.3.1-4.3.4 EIS Sec. 4.4.1 EIS Secs. 4.5.1 & 4.5.2 EIS Secs. 4.6.1-4.6.5 EIS App. H EIS App. I POD Att. I POD Att. BB
Prior to implementing actions that could result in habitat modification or species disturbance in habitat for the Fender's blue butterfly, Oregon silverspot butterfly, Taylor's checkerspot butterfly, streaked horned lark, Lower Columbia River distinct population segment of Columbian white-tailed deer, or western snowy plover, conduct surveys to determine species presence.	P	R	EIS Sec. 1.5 EIS Secs. 4.6.1-4.6.5
Manage Fender's blue butterfly, Oregon silverspot butterfly, Taylor's checkerspot butterfly, streaked horned lark, Lower Columbia River distinct population segment of Columbian white-tailed deer, and western snowy plover consistent with recovery plans, critical habitat and developed conservation measures. Do not endorse actions that would adversely affect these species.	N		
Manage designated critical habitat for the western snowy plover consistent with recovery plans, critical habitat, and other approved plans and measures. Do not endorse actions that would adversely affect critical habitat for this species unless done in accordance with an approved recovery plan or other approved plan.	N		
Resource Programs — Wildlife: Bald and Golden Eagles			
Protect known bald eagle or golden eagle nests and bald eagle winter roosting areas. Prohibit activities that will disrupt bald eagles or golden eagles that are actively nesting. See RMP for activity allowances and prohibitions.	P, C, R, O	P, B	EIS Sec. 1.5 EIS Secs. 4.6.1-4.6.5

TABLE 1.1-1

Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	Applicability	Consistency	EIS Section
Resource Programs — Wildlife: Bats			
Protect known maternity colonies and hibernacula for Bureau Sensitive bat species within caves, mines, bridges, and buildings with a 250-foot buffer. See RMP for specific prohibitions.	P, C, O	P, B	EIS Sec. 1.5 EIS Sec. 4.6.4
Prohibit blasting during periods of reproduction and hibernation within 1 mile of known maternity colonies and hibernacula for Bureau Sensitive bat species within caves, abandoned mines, bridges, and buildings.	C	P, B	EIS Sec. 1.5 EIS Secs. 2.4.1 & 2.4.2 EIS Sec. 4.6.4
Where white-nose syndrome is found in the bats residing within caves, abandoned mines, bridges, and buildings, prohibit human access except for monitoring, education, or research purposes.	N		
Resource Programs — Wildlife: Deer or Elk Management Area (Salem District)			
Not Applicable, Excluded from Table			
Resource Programs — Wildlife: Fisher			
Do not approve, fund, or carry out actions that would disrupt normal fisher behaviors associated with known natal or maternal denning sites, except when done in accordance with an approved recovery plan or other applicable plan or strategy.	P, C, O	P, B	EIS Sec. 1.5 EIS Sec. 4.6.1
Manage known natal or maternal denning sites in a manner that would not adversely affect fisher except when taking actions that are necessary to treat or protect stands from sudden oak death. Follow measures in RMP for other actions where there are documented fisher natal or maternal dens.	P, C, O	P, B	EIS Sec. 1.5 EIS Sec. 4.6.1
Within 5th field-watersheds (HUC 10) where fisher are documented by the BLM to occur, favor retaining trees that have structures that are typically used as denning or resting sites by fisher.	P, C	P, B	EIS Sec. 1.5 EIS Sec. 4.4.2 EIS Sec. 4.6.1 POD Att. P POD Att. U
Resource Programs — Wildlife – Gray Wolf			
Restrict activities that create noise or visual disturbance(s) above ambient conditions within one mile of known active gray wolf dens from April 1 to July 15.	P, C, O	P, B	EIS Sec.1.5 EIS Sec. 4.6.1 POD Att. B
Resource Programs — Wildlife: Marbled Murrelet			
Except as stated under Option 3 (see RMP), and except when needed to protect human safety and property, prohibit activities that disrupt marbled murrelet nesting at occupied sites when conducting activities within all land uses allocations within 35 miles of the Pacific Coast and when conducting activities within reserved land use allocations between 35-50 miles of the Pacific Coast.	P, C, R,O	A	Amendment-District Designated Reserve EIS Section 2.1.3.1

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Northwestern and Coastal Oregon Approved Management Actions/Direction - 2016

Element	Applicability	Consistency	EIS Section
Before modifying nesting habitat or removing nesting structure in all land use allocations within 35 miles of the Pacific Coast and in LSR/RR between 35-50 miles of the Pacific Coast and outside of exclusion areas C and D (see RMP), assess the analysis area for marbled murrelet nesting structure. See RMP for nesting analysis structure and options for surveys and protection.	P	A	Amendment-District Designated Reserve EIS Section 2.1.3.1
Resource Programs — Wildlife: Northern Spotted Owl			
Manage habitat conditions for northern spotted owl movement and survival between and through large blocks of northern spotted owl nesting-roosting habitat.	N		
Do not authorize timber sales that would cause the incidental take of northern spotted owl territorial pairs or resident singles from timber harvest until implementation of a barred owl management program consistent with the assumptions contained in the Biological Opinion on the RMP has begun.	N		
Resource Programs — Wildlife: Pacific Coast Distinct Population Segment of the Western Snowy Plover			
Do not authorize or construct additional discretionary roads and trails within designated critical habitat or within western snowy plover habitat.	P	R	EIS Sec. 1.5 EIS Sec. 4.6.1 EIS Secs. 4.10.1-4.10.3 POD Att. Y
Restore snowy plover nesting habitat.	N		
Restrict the timing and location of beach access or activities to avoid disruption of normal snowy plover nesting and nesting behaviors.	N		

1.2 SOUTHWESTERN OREGON APPROVED RESOURNCE MANAGEMENT PLAN-2016

Project consistency with this RMP is addressed in Table 1.2-1 below.

TABLE 1.2-1

Southwestern Oregon Approved Management Actions/Direction – 2016

Element	Applicability	Consistency	EIS Section
Land Use Allocations — Congressionally Reserved Lands and National Conservation Lands			
Management Objectives			
Conserve, protect, and restore the identified outstanding cultural, ecological, and scientific values of National Conservation Lands and other congressionally designated lands.	N		
Preserve the wilderness character of designated Wilderness Areas.	N		
Preserve wilderness characteristics in Wilderness Study Areas in accordance with non-impairment standards as defined under the management policy for Wilderness Study Areas until congress either designates these lands or releases them for other purposes.	N		
Protect and enhance the free-flowing condition, water quality, and outstanding remarkable values of eligible, suitable, and designed Wild and Scenic River corridors.	N		
Provide protection to Wild and Scenic River corridors that are suitable for inclusion as components of the National Wild and Scenic Rivers system until Congress makes a decision on designation.	P, C, R	P, B	EIS Sec. 4.8.1 EIS Sec. 4.9.2
Provide protection to Wild and Scenic River corridors that are eligible but have not yet been studied for suitability as components of the National Wild and Scenic Rivers system pending suitability evaluations.	P, C, R	P, B	EIS Sec. 4.8.1 EIS Sec. 4.9.2
Management Direction			
In designated Wilderness Areas, exclude all defined prohibited uses of Wilderness unless they have been demonstrated to be the minimum necessary to administer the area for the purposes of the Wilderness Act.	N		
Manage wildfires in designated Wilderness Areas using minimum impact suppression techniques wherever practicable, while providing for the safety of firefighters and the public and meeting fire management objectives. Address prohibited uses of Wilderness in wildfire management consistent with BLM Manual 6340.	N		
Provide for the enjoyment and appreciation of the resources, qualities, values, and associated settings and primary uses within National Trail rights-of-way and for which National Trails are designated.	N		
Enhance, promote, and protect the scenic, natural, and cultural resource values associated with current and future designated National Scenic and Historic Trails.	P, C, O	P, B	EIS Sec. 2.4.1 EIS Sec. 4.8.1 POD Att. S

TABLE 1.2-1

Southwestern Oregon Approved Management Actions/Direction – 2016

Element	Applicability	Consistency	EIS Section
Conduct silviculture treatments in National Trail management corridors only as needed to protect or maintain recreation setting characteristics or to achieve recreation objectives.	N		
Conduct management actions in Wild and Scenic River corridors only if consistent with designated or tentative classifications and if any reductions in outstandingly remarkable values would be temporary and outstanding remarkable values would be protected or enhanced over the long term.	N		
During wildfire management operations, use strategies and tactics that would protect outstandingly remarkable values and classifications within Wild and Scenic River corridors, except where the wildlife is deemed a threat to human safety or private property, or where use is essential for wildlife control, as deemed by the Incident Commander.	N		
Land Use Allocations — District-Designated Reserves			
Management Objectives			
Maintain the values and resources for which the BLM has reserved these areas from sustained-yield timber production.	P	P, B, A	EIS Sec. 1.5 EIS Secs. 4.4.1 & 4.4.2 POD Att. I POD Att. P POD Att. U Amendment-District Designated Reserve EIS Section 2.1.3.1
Management Direction			
Manage constructed facilities and infrastructure, such as seed orchards, roads, communication sites, quarries, buildings, and maintenance yards, as needed for purposes for which the BLM constructed them.	P	A	Amendment-District Designated Reserve EIS Section 2.1.3.1
Maintain access to roads to facilities by removing hazard trees and blowdown. Such logs may be retained as down woody material, moved for placement in streams for fish habitat restoration, or removed through a commercial harvest or special forest products sale.	C, R, O	P, B	EIS Sec. 2.1.2 EIS Sec. 2.6.2 EIS Sec. 4.7.3 EIS Sec. 4.10.3 POD Att. I POD Att. Y
Manage seed orchards consistent with the Seed Orchard Records of Decision for Integrated Pest Management.	N		
Land Use Allocations — District-Designated Reserves-Areas of Critical Environmental Concern			
Not Applicable, Excluded from Table			

TABLE 1.2-1

Southwestern Oregon Approved Management Actions/Direction – 2016

Element	Applicability	Consistency	EIS Section
Land Use Allocations — District-Designated Reserves – Timber Production Capability Classification			
Management Direction			
Manage areas identified as unsuitable for sustained-yield timber production through the Timber Production Capability Classification system, for other uses if those uses are compatible with the reason for which the BLM has reserved these lands.	P	P,B	EIS Sec. 4.2.2 & 4.2.3 POD Att. I
Maintain access to roads to facilities by removing hazard trees and blowdown. Such logs may be retained as down woody material, moved for placement in streams for fish habitat restoration, or removed through a commercial harvest or special forest products sale.	C, R, O	P, B	EIS Sec. 2.1.2 EIS Sec. 2.6.2 EIS Sec. 4.7.3 EIS Sec. 4.10.3 POD Att. I POD Att. Y
Apply silviculture or fuels treatments, including prescribed fire, that restore or maintain community-level structural characteristics, promote desired species composition, and emulate ecological conditions produced by historic fire regimes, in areas identified as unsuitable for sustained-yield timber production.	N		
Designate additional lands as District-Designated Reserve – Timber Production Capability Classification through updates to the Timber Production Capability Classification system and remove those lands from the Harvest Land Base when examinations indicate that those lands meet the criteria for reservation.	N		
Un-designate lands as District-Designated Reserve – Timber Production Capability Classification and return those lands to Harvest Land Base through updates to the Timber Production Capability Classification system and remove those lands from the Harvest Land Base when examinations indicate that those lands do not meet the criteria for reservation.	N		
Land Use Allocations — District-Designated Reserves-Lands Managed for their Wilderness Characteristics			
Not Applicable, Excluded from Table			
Land Use Allocations — Eastside Management Area: Harvest Land Base			
Management Objectives			
Manage forest stands to achieve continual timber production that can be sustained through a balance of growth and harvest.	N		
Offer for sale the declared Allowable Sale Quantity of timber.	N		
Recover economic value from timber following disturbances, such as fires, windstorms, disease, or insect infestations.	N		
In harvested or disturbed areas, ensure the establishment and survival of desirable trees appropriate to the site and enhance their growth.	R	P, B	POD Att. I POD Att. P
Enhance the economic value of timber in forest stands.	N		

TABLE 1.2-1

Southwestern Oregon Approved Management Actions/Direction – 2016

Element	Applicability	Consistency	EIS Section
Management Direction			
Conduct silviculture treatments to contribute timber volume to Allowable Sale Quantity.	N		
Conduct silviculture treatments to enhance timber values and to reduce fire risks and insect and disease outbreaks.	N		
During commercial harvest, except timber salvage, and except for safety, operational, or fuels reduction reasons, retain existing snags and down woody materials as specified in the RMP.	N		
When implementing commercial harvest, except timber salvage, in stands with less than 26 snags per ace over 20 inches DBH and less than 8 snags per acre over 20 inches DBH, create new snags as specified in the RMP.	N		
Employ site preparation methods such as mechanical treatments, manual treatments, and prescribed burns to prepare newly harvested and inadequately stocked areas for the regeneration of desirable tree species.	N		
Manually apply supplemental nutrients where necessary to enhance vigor and growth of desired vegetation. Do not use aerial application methods.	R	P, B	EIS Sec. 4.4.1 POD Att. I
If not suitable for commercial removal, allow cut hazard trees to be available for habitat restoration purposes in any land use allocation, including off-site from the location where such hazard trees are cut.	C, R, O	P, B,	EIS Sec. 4.4.2 POD Att. I POD Att. U
Where trees are cut for yarding corridors, skid trails, road construction, maintenance, and improvement, retain cut trees in adjacent stands as down woody material, move cut trees for placement in streams for fish habitat restoration, or sell trees at the discretion of the BLM. For trees of a certain age or size as described in the RMP keep as down woody material in adjacent stands.	C, R, O	P, B	EIS Sec. 4.4.2 POD Att. I POD Att. U
Where trees are cut for right-of-way permits, retain cut trees in adjacent stands as down woody material, move cut trees for placement in streams for fish habitat restoration, or sell trees to the right-of-way permittee, at the discretion of the BLM and consistent with valid existing rights. For trees of a certain age or size as described in the RMP keep as down woody material in adjacent stands.	C, R, O	P, B,	EIS Sec. 4.4.2 POD Att. I POD Att. U
Harvest Land Base – Low Intensity Timber Area (LITA)			
Not Applicable, Excluded from Table			
Harvest Land Base – Moderate Intensity Timber Area (MITA)			
Not Applicable, Excluded from Table			
Harvest Land Base – Uneven-aged Timber Area (UTA)			
Not Applicable, Excluded from Table			

TABLE 1.2-1

Southwestern Oregon Approved Management Actions/Direction – 2016

Element	Applicability	Consistency	EIS Section
Land Use Allocations — Late-Successional Reserve			
Management Objective			
Maintain nesting-roosting habitat for the northern spotted owl and nesting habitat for the marbled murrelet.	P, R, C, O	A	Amendment-District Designated Reserve EIS Section 2.1.3.1
Promote the development of nesting-roosting habitat for northern spotted owl in stands that do not currently support northern spotted owl nesting and roosting.	N		
Promote the development of nesting habitat for the marbled murrelet in stands that do not currently meet nesting habitat criteria.	N		
Promote the development and maintenance of foraging habitat for the northern spotted owl, including creating and maintaining habitat to increase diversity and abundance of prey for the northern spotted owl.	N		
Management Direction			
Manage for large blocks of northern spotted owl nesting-roosting habitat that supports clusters of reproducing spotted owls, are distributed across the variety of ecological conditions, and are spaced to facilitate the movement and survival of spotted owls dispersing between and through the blocks.	N		
In stands that are currently northern spotted owl nesting-roosting habitat, maintain nesting-roosting habitat function, regardless of northern spotted owl occupancy.	P, C, R, O	A	Amendment-District Designated Reserve EIS Section 2.1.3.1
Protect stands of older, structurally-complex conifer forest. Such stands are a subset of, and represent the highest value, northern spotted owl nesting-roosting habitat.	P	A	Amendment-District Designated Reserve EIS Section 2.1.3.1
Undertake activities such as individual tree removal, including the felling of hazard trees and stream logs, and the construction of linear and non-linear rights-of-way or other facilities, including communication sites, as long as northern spotted owl nesting-roosting habitat continues to support northern spotted owl nesting and roosting at the stand level and supports dispersal movements.	P C, R, O	A	Amendment-District Designated Reserve EIS Section 2.1.3.1
Protect marbled murrelet occupied stands. Prohibit activities in occupied stands except the activities described in the RMP which includes restoration and rights-of-way construction or maintenance as long as stands continue to support marbled murrelet nesting.	P, C, R, O	A	Amendment-District Designated Reserve EIS Section 2.1.3.1
During silviculture treatment of stands retain existing snags and down woody material to the specifications described in the RMP.	N		
Cut or tip individual live trees and move for placement in streams for fish habitat restoration.	, N		

TABLE 1.2-1

Southwestern Oregon Approved Management Actions/Direction – 2016

Element	Applicability	Consistency	EIS Section
Do not conduct timber salvage, except when necessary to protect public safety, or to keep roads and other infrastructure clear of debris.	C, R, O	P, B	EIS Sec. 2.1.2 EIS Sec. 2.6.2 EIS Sec. 4.4.2 POD Att. I POD Att. U
Maintain access to roads and facilities by removing hazard trees and blowdown. Such logs may be retained as down woody material, moved for placement in streams for fish habitat restoration, or removed through a commercial harvest or special forest products sale.	C, R, O	P, B	EIS Sec. 2.1.2 EIS Sec. 2.6.2 EIS Sec. 4.4.2 POD Att. I POD Att. U POD Att. Y
Where trees are cut for yarding corridors, skid trails, road construction, maintenance, and improvement, retain cut trees in adjacent stands as down woody material, move cut trees for placement in streams for fish habitat restoration, or sell trees, at the discretion of the BLM. Retain large or old trees as down woody material as specified in the RMP.	C, R, O	P, B	EIS Sec. 2.1.2 EIS Sec. 2.6.2 EIS Sec. 4.4.2 POD Att. I POD Att. U POD Att. Y
Where trees are cut for rights-of-way permits, retain cut trees in adjacent stands as down woody material, move cut trees for placement in streams for fish habitat restoration, or sell trees to the right-of-way permittee, at the discretion of the BLM and consistent with valid existing rights. Retain large or old trees as down woody material as specified in the RMP.	C, R, O		EIS Sec. 2.1.2 EIS Sec. 2.6.2 EIS Sec. 4.4.2 POD Att. I POD Att. U POD Att. Y
In stands that are not northern spotted owl nesting-roosting habitat, apply silviculture treatments to speed the development of northern spotted owl nesting-roosting habitat or improve the quality of northern spotted owl nesting-roosting habitat in the stand or in the adjacent stand in the long term. Limit silviculture treatments as specified in the RMP.	N		
Utilize integrated vegetation management in designing and implementing treatments. Conducted integrated vegetation management for the reasons specified in the RMP.	N		
In stands ≥ 10 acres treated with selection harvest or commercial thinning, conduct harvest and do not create group selection openings as specified in the RMP.	N		
In stands < 10 acres treated with selection harvest or commercial thinning, do not create group selection openings more than 2.5 acres in size.	N		
Use natural or artificial regeneration or both to reforest group selection openings created from selection harvest or commercial thinning with a mixture of species appropriate to the site to an average density across the group selection openings of at least 75 trees per acre within 5 years of harvest.	N		
When conducting commercial harvest, in stands with less than 64 snags per acre > 10” DBH and less than 19 snags per acre > 20” DBH on average across the harvest unit, create new snags as specified in the RMP within 1 year of completion of yarding the timber in the timber sale.	N		

TABLE 1.2-1

Southwestern Oregon Approved Management Actions/Direction – 2016

Element	Applicability	Consistency	EIS Section
When conducting fuels reduction or prescribed fire treatments, retain down woody material at levels specified in the RMP. Meet down wood levels as an average at the scale of the treatment area following the treatment.	N		
Land Use Allocations — Riparian Reserve – Dry			
Management Objectives			
Enable forests to: (1) recover from past management measures, (2) respond positively to climate-driven stresses, wildfire and other disturbance with resilience (3) ensure positive or neutral ecological impacts from wildfire, and (4) contribute to northern spotted owl recovery.	P, C, R, O		EIS Sec. 4.4.2 EIS Secs. 4.6.1-4.6.4 EIS App. I POD Att. I POD Att. P POD Att. U
Reduce the risk of loss of key late-successional structure through the development of vertical and horizontal heterogeneity.	N		
Increase diversity of stocking levels and size classes within the stand and the landscape.	N		
Management Direction			
Apply selection harvest or commercial thinning treatments to at least 4,500 acres per decade in the South River Field Office of Roseburg District.	N		
Apply selection harvest or commercial thinning treatments to at least 17,000 acres per decade in the Medford District.	N		
When treating stands with integrated vegetation management, retain dominant Douglas-fir and pine trees that are over 36 inches DBH and were established prior to 1850 and madrone, bigleaf maple, and oak trees over 24 inches DBH except were falling is necessary for safety or operational reasons and retain these cut trees in the stand.	N		
Treat fuels to improve, enhance, or maintain landscape and ecosystem resilience. Identify sites for fuels treatments based on risk of large-scale high-intensity/high-severity fire, operationally strategic locations, or proximity to highly valued resources and assets.	N		
Modify fuel beds to produce characteristic fire behavior and fire effects representative of the fire regime. Implement interim fuels treatments in areas that are highly departed from natural conditions in order to facilitate prescribed fire in the future.	N		
Apply prescribed fire in low/mixed severity or high-frequency fire regimes to emulate historic fire function and processes. Apply prescribed fire across the landscape to create a mosaic of spatial and temporal stand conditions and patterning. Based on site-specific considerations, take measures to prevent and control fire regime altering species.	N		

TABLE 1.2-1

Southwestern Oregon Approved Management Actions/Direction – 2016

Element	Applicability	Consistency	EIS Section
Apply prescribed fire and mechanical or hand fuels treatments to reduce the potential for uncharacteristic wildfires. Apply maintenance treatments at appropriate intervals to retain or improve fire-resistant conditions.	N		
Land Use Allocations — Riparian Reserve – (West of Highway 97)			
<u>Management Objectives</u>			
Contribute to the conservation and recovery of ESA-listed fish species and their habitats and provide for the conservation of Bureau Special Status fish and other Bureau Special Status riparian-associated species.	P, R	P, B	EIS Sec. 1.5 EIS Sec. 4.3.2 EIS Secs. 4.6.1-4.6.5 EIS App. I POD Att. J POD Att. L POD Att. BB
Maintain and restore natural channel dynamics, processes, and the proper functioning condition of riparian areas, stream channels, and wetlands by providing forest shade, sediment filtering, wood recruitment, stream bank and channel stability, water storage and release, vegetation diversity, nutrient cycling, and cool and moist microclimates.	P, R	P, B	EIS Sec. 1.5 EIS Secs. 4.3.1-4.3.4 EIS Sec. 4.5.2 EIS App. I POD Att. I POD Att. BB
Maintain water quality and streamflows within the range of natural variability, to protect aquatic biodiversity, provide quality water for contact recreation and drinking water sources.	P, R	P, B	EIS Sec. 1.5 EIS Secs. 4.3.1-4.3.4 EIS Sec. 4.5.2 EIS App. I POD Att. I POD Att. BB
Meet Oregon Department of Environmental Quality (ODEQ) water quality criteria. (Note: This is a requirement of the RMP however compliance is the responsibility of the proponent who must secure a Clean Water Act Section 401 permit from the State of Oregon as a condition of the Right of Way Grant...)	P, C, R	P, B	EIS Sec. 1.5 EIS Sec. 2.4.2 EIS Secs. 4.3.2, 4.3.3 & 4.3.4 EIS Sec. 4.5.2 EIS App. H POD Att. I POD Att. BB
Maintain high quality water and contribute to the restoration of degraded water quality for 303(d)-listed streams.	P, R	P, B	EIS Sec. 1.5 EIS Secs. 4.3.1-4.3.4 EIS Sec. 4.5.2 EIS App. I POD Att. I POD Att. BB

TABLE 1.2-1

Southwestern Oregon Approved Management Actions/Direction – 2016

Element	Applicability	Consistency	EIS Section
Maintain high quality waters within ODEQ-designated Source Water Protection watersheds.	P, R	P, B	EIS Sec. 1.5 EIS Secs. 4.3.1-4.3.4 EIS Sec. 4.5.2 EIS App. I POD Att. I POD Att. BB
Management Direction			
Prohibit timber salvage, except when necessary to protect public safety, or to keep roads and other infrastructure clear of debris.	O	P, B	EIS Sec. 1.5 EIS Sec. 4.4.2 EIS Secs. 4.10.1 & 4.10.2 POD Att. P POD Att. U POD Att. Y
Maintain access to roads and facilities by removing hazard trees and blowdown from roads and facilities. Retain such logs as down woody material within adjacent stands or move for placement in streams for fish habitat restoration, unless removal of logs, including through commercial harvest, is necessary to maintain access to roads and facilities.	C, R, O	P, B	EIS Sec. 4.4.2 POD Att. I POD Att. U
Allow yarding corridors, skid trails, road construction, stream crossings, and road maintenance and improvement where there is no operationally feasible and economically viable alternative to accomplish other resource management objectives.	P, C, O	P, B	EIS Sec. 1.5 EIS Sec. 4.4.2 EIS Secs. 4.10.1 & 4.10.2 POD Att. P POD Att. U POD Att. Y
Where trees are cut for yarding corridors, skid trails, road construction, maintenance, and improvement in the Inner Zone or Middle Zone, retain cut trees in adjacent stands as down woody material or move cut trees for placement in streams for fish habitat restoration, at the discretion of the BLM. In the Outer Zone or in Riparian Reserves with non-stream features retain cut trees as described above or sell trees at the discretion of the BLM. For large or old trees retain as down woody material as described in the RMP.	C, R	P, B	EIS Sec. 4.4.2 POD Att. I POD Att. U
Where trees are cut for right-of-way permits in the Inner or Middle Zone retain cut trees in adjacent stands as down woody material, move cut trees for placement in streams for fish habitat restoration, or sell trees to right-of-way permittee as necessary for fuel reduction. In the Outer Zone keep as down woody material, place in streams for fish habitat, or sell trees to right-of-way permittee at BLM discretion and with valid existing rights. For large and old trees retain as described in the RMP.	C, R	P, B	EIS Sec. 4.4.2 POD Att. I POD Att. U
Use site-specific BMPs to maintain water quality during land management actions, including discretionary actions of other crossing BLM-administered lands.	C, R	P, B	POD Att. I POD Att. X POD Att. BB
In new recreational developments, install sanitation systems that maintain water quality.	N		

TABLE 1.2-1

Southwestern Oregon Approved Management Actions/Direction – 2016

Element	**Applicability**	**Consistency**	**EIS Section**
Do not operate ground-based machinery for timber harvest within 50 feet of stream, except where machinery is on improved roads, designated stream crossings, or where equipment entry into the 50-foot zone would not increase the potential for sediment delivery into the stream.	N		
Do not operate ground-based machinery for timber harvest on slopes > 35 percent. See RMP for exceptions for machinery with tracks.	N		
During silviculture treatment of stands, retain existing snags and down woody material as specified in the RMP.	N		
Cut or tip individual live trees and move for fish habitat restoration.	N		
Cut or tip individual live trees directly into the stream channel for fish habitat restoration.	N		
Tree tipping: when conducting commercial thinning in any portion of the Outer Zone in a stand in all watershed classes, cut or tip from 0 to 15 square feet of basal area per acre of live trees, averaged across the Riparian Reserve portion of the treated stand. Leave cut or tipped trees on site as specified in the RMP.	N		
Promote beaver habitat restoration where the presence of beaver and their associated dams would improve fish and aquatic habitat.	R	P, B	EIS Sec. 4.5.1
Along ponds and wetlands < 1 acre and constructed water impoundments of any size, treat vegetation as needed for habitat restoration, access, or safety.	C, R	P, B	EIS Sec. 2.4.2 EIS Secs. 4.3.2, 4.3.3 & 4.3.4 EIS Sec. 4.5.2 EIS App. H POD Att. I POD Att. BB
For constructed water impoundments and constructed ponds, follow inspection guidelines, dredge as necessary, and maintain vegetation, access, and plumbing as specified in the RMP.	N		
Riparian Reserve distances vary depending on intermittency of streams, bearing of fish, unstable areas, and size of wetlands. See RMP for Riparian Reserves distance calculations.	P	P, B, R	EIS Secs. 4.3.2 & 4.3.3 EIS App. H POD Att. BB
Land Use Allocations — Riparian Reserve – Moist			
For fish-bearing and perennial streams in the Inner Zone do not thin stands except as specified in the RMP.	N		
For fish-bearing and perennial streams in the Outer Zone thin stands as needed to provide trees that would function as stable wood in the stream. Maintain canopy cover and density as specified in the RMP.	N		
For intermittent, non-fish-bearing streams, do not thin stands in the Inner Zone except as specified in the RMP.	N		

TABLE 1.2-1

Southwestern Oregon Approved Management Actions/Direction – 2016

Element	**Applicability**	**Consistency**	**EIS Section**
For intermittent, non-fish-bearing streams, thin stands as needed in the Middle Zone and Outer Zone as needed to provide trees that would function as stable wood in the stream. Maintain canopy cover and density as specified in the RMP.	N		
Land Use Allocations — Riparian Reserve – Dry			
Management Objectives			
See Riparian Reserve (West of Highway 97)			
Management Direction			
See Riparian Reserve (West of Highway 97)			
In all subwatershed classes apply low or moderate-severity prescribed burns where needed to invigorate native deciduous tree species. Moderate severity prescribed burns as specified in the RMP and apply non-commercial tree thinning to adjust fuel loads as necessary to achieve desired fire effects prior to prescribed burning.	N		
When conducting fuels or prescribed fire treatments, retain down woody material at levels specified in the RMP. Down woody material retention standards would be met as an average at the scale of the treatment area and is not intended to be attained on every acre.	N		
For fish-bearing and perennial streams in the Inner Zone do not thin stands except as specified in the RMP.	N		
For fish-bearing and perennial streams in the Outer Zone thin stands as needed to provide trees that would function as stable wood in the stream. Maintain canopy cover and density as specified in the RMP. Apply fuels reduction treatments and make available for the sale the merchantable timber from thinning and other treatments.	N		
For intermittent, non-fish-bearing streams, do not thin stands in the Inner Zone except as specified in the RMP.	N		
For intermittent, non-fish-bearing streams, thin stands as needed in the Middle Zone and Outer Zone as needed to provide trees that would function as stable wood in the stream. Maintain canopy cover and density as specified in the RMP. Apply fuels reduction treatments, remove cut or tipped as needed for safety or operation in the Middle Zone, and make available for the sale the merchantable timber from thinning and other treatments in the Outer Zone.	N		
Land Use Allocations — Administrative Actions			
Not Applicable, Excluded from Table			

TABLE 1.2-1

Southwestern Oregon Approved Management Actions/Direction – 2016

Element	Applicability	Consistency	EIS Section
Resource Programs — Air Quality			
Management Objectives			
Protect air quality related values in Federal mandatory Class I areas.	C, R, O	P, B	EIS Sec. 1.5 EIS Sec. 4.12.1 POD Att. B
Prevent exceedances of National, State, or local ambient air quality standards.	C, R, O	P, B	EIS Sec. 1.5 EIS Sec. 4.12.1 POD Att. B
Management Direction			
Comply with the Oregon Smoke Management Plan when implementing prescribed burning activities.	C	P. B	EIS Sec. 1.5 EIS Sec. 2.4.2 EIS Sec. 4.4.2 POD Att. U POD Att. Q
Use BMPs to reduce dust from unpaved road surfaces during extended management operations, such as timber sales and wildfire management actions/activities.	C, R, O	P, B	EIS Sec. 1.5 EIS Sec. 4.12.1 POD Att. B
Follow State Implementation Plan requirements for activities that could negatively affect the status of air quality non-attainment or maintenance areas.	P, C, R, O	P, B	EIS Sec. 1.5 EIS Sec. 4.12.1 POD Att. B
Resource Programs — Cultural Resources			
Management Objectives			
Preserve and protect significant cultural resources and ensure that they are available for appropriate uses by present and future generations.	P, C	P, B,	EIS Secs. 4.11.1-4.11.3 POD Att. Z
Reduce imminent threats and resolve potential conflicts from natural or human-caused deterioration or potential conflict with other resources by ensuring that all authorizations for land and resource use comply with Section 106 of the National Historic Preservation Act.	P	R	EIS Secs. 4.11.1-4.11.5 POD Att. Z
Management Direction			
Evaluate all documented cultural resources for National Register of Historic Places eligibility. For all sites that are listed or eligible for listing on the National Register of Historic Places, protect sites through avoidance or other protection measures.	P, C	P, B	EIS Secs. 4.11.1-4.11.3 POD Att. Z
Conduct public education and outreach activities and develop materials in order to educate and interpret for the public the cultural and historic resources within the decision area.	N		
Assign all cultural resources into one of the use allocations specified in the RMP.	N		

TABLE 1.2-1

Southwestern Oregon Approved Management Actions/Direction – 2016

Element	**Applicability**	**Consistency**	**EIS Section**
Resource Programs — Fire, Fuels, and Wildfire Response			
Management Objective			
Respond to wildfires in a manner that provides for public and firefighter safety while meeting land management objectives by utilizing the full range of fire management options.	N		
Fire management strategies would be risk-based decisions that consider firefighter and public safety, values at risk, management objectives, and costs that are commensurate with the identified risk.	N		
Actively manage the land to restore and maintain resilience of ecosystems to wildfire and decrease the risk of uncharacteristic, large, high-intensity/high-severity wildfires.	N		
Manage fuels to reduce wildfire response consistent with the National Cohesive Wildland Fire Management Strategy.	N		
Participate with communities bordering Federal lands in partnership with local, State, and Federal stakeholders to reduce risks and threats from wildland fire.	N		
Management Direction			
Take immediate action to suppress all unplanned human-caused ignitions at the lowest cost commensurate with the protection of firefighter and public safety and welfare and resulting in the fewest negative consequences to natural and cultural resources.	C, R, O	P, B	EIS Secs. 4.4.1 & 4.4.2 POD Att. K
Allow application of the full range of fire management options in responding to natural ignitions or escaped prescribed fires. These fires may be used to achieve management objectives as specified in the RMP.	N		
Conduct wildfire rehabilitation and restoration actions to protect and sustain ecosystems, ecosystem services, public health and safety, and infrastructure adversely affected by fire management operations or direct fire effects.	N		
Treat both management activity fuels and natural hazardous fuels for any of the reasons specified in the RMP such as reducing potential fire behavior.	N		
Treat fuels in a way that increase intervals between future maintenance treatments.	N		
Create fuel beds or fuel breaks that reduce potential for high-intensity/high-severity fire spread within the wildland urban interface or in close proximity to highly valued resources.	N		
Prior to applying prescribed fire, take necessary mitigation actions to reduce impacts to Bureau Special Status Species wildlife and plants and their habitats.	N		
Conduct necessary vegetation maintenance treatments to ensure that fire management operations are able to access existing natural and human-made strategic infrastructure.	N		

TABLE 1.2-1

Southwestern Oregon Approved Management Actions/Direction – 2016

Element	Applicability	Consistency	EIS Section
Resource Programs — Fisheries			
Management Objectives			
Improve the distribution and quantity of high-quality fish habitat across the landscape for all life stages of ESA-listed, Bureau Special Status Species, and other fish species.	N		
Maintain and restore access to stream channels for all life stages of aquatic species.	P, C, R, O	P, B,	EIS Sec. 1.5 EIS Sec. 4.3.2 EIS Sec. 4.5.2 EIS Secs. 4.6.1-4.6.5 POD Att. L POD Att. BB
Management Direction			
Restore degraded spawning, rearing, and holding habitat for fish using a combination of accepted techniques including but not limited to log and boulder placement in stream channels, tree tipping, and gravel enhancement.	P, R	P, B,	EIS Sec. 1.5 EIS Sec. 4.3.2 EIS Sec. 4.5.2 EIS Secs. 4.6.1-4.6.5 POD Att. L POD Att. BB
Remove or modify human-caused fish passage barriers to restore access to stream channels for all life stages for native aquatic species.	P, R	P, B,	EIS Sec. 1.5 EIS Sec. 4.3.2 EIS Sec. 4.5.2 EIS Secs. 4.6.1-4.6.5 POD Att. L POD Att. BB
Resource Programs — Forest Management			
Management Objectives			
Enhance the health, stability, growth, and vigor of forest stands.	N		
In harvested or disturbed areas, ensure the establishment and survival of desired vegetation appropriate to the site.	N		
Facilitate safe and efficient forestry operations for the BLM, reciprocal right-of-way agreement holders, and permittees.	N		
Management Direction			
Promote the establishment and survival of desirable vegetation through stand maintenance treatments.	N		
Apply thinning or prescribed fire to forest stands as needed to achieve appropriate stocking and density levels.	N		
Use genetically improved native trees for reforestation when available.	R	P, B	EIS Sec. 4.4.2 POD Att. I POD Att. U

TABLE 1.2-1

Southwestern Oregon Approved Management Actions/Direction – 2016

Element	Applicability	Consistency	EIS Section
Fall and move live or dead trees as needed for safety or operational reasons, including but not limited to, the creation of landings, yarding corridors, or skid trails within or adjacent to nearby harvest units, hazard tree removal, and road construction, improvement, or maintenance.	C, R, O	P, B	EIS Sec. 2.4.2 EIS Sec. 4.4.2 EIS App. I POD Att. P POD Att. U
Allow road construction, maintenance, improvement, and decommissioning as well as construction of skid trails and yarding corridors based on operational needs and consistent with valid existing rights.	P, C, R, O	PB	EIS Sec. 4.10.2 POD Att. Y
Allow management activities in density management study sites that are compatible with study objectives.	N		
Resource Programs — Hydrology			
Management Objectives			
Maintain water quality within the range of natural variability that meets ODEQ water quality standards for drinking water, contact recreation, and aquatic biodiversity.	P, C, O	P, B	EIS Sec. 1.5 EIS Secs. 4.3.1-4.3.4 EIS Sec. 4.5.2 POD Att. BB
Management Direction			
Select and implement site-level BMPs to maintain water quality for BLM actions and discretionary actions of others crossing BLM-administered lands.	P, C, R	P, B	EIS Sec. 1.5 EIS Secs. 4.3.1-4.3.4 EIS Sec. 4.5.2 POD Att. BB
Design culverts, bridges, and other stream crossings for a 100-year flood event and for standards for ESA-listed fish and other requirements described in the RMP.	P	P, B	EIS Sec. 1.5 EIS Secs. 4.3.1-4.3.4 EIS Sec. 4.5.2 EIS Secs. 4.10.1 & 4.10.2 POD Att. Y POD Att. BB
Implement road improvements, storm proofing, maintenance, or decommissioning to reduce or eliminate chronic sediment inputs to stream channels and waterbodies.	P, R	P, B	EIS Sec. 1.5 EIS Secs. 4.3.1-4.3.4 EIS Sec. 4.5.2 EIS Secs. 4.10.1 & 4.10.2 POD Att. I POD Att. Y POD Att. BB
Suspend commercial road use where the road surface is deteriorating due to vehicle rutting or standing water, or where turbid runoff is likely to reach stream channels.	P, C, R, O	P,B	EIS Sec. 1.5 EIS Secs. 4.3.1-4.3.4 EIS Sec. 4.5.2 EIS Secs. 4.10.1 & 4.10.2 POD Att. I POD Att. Y POD Att. BB

TABLE 1.2-1

Southwestern Oregon Approved Management Actions/Direction – 2016

Element	Applicability	Consistency	EIS Section
Decommission roads that are no longer needed for resource management and are at risk of failure for are contributing sediment to streams, consistent with valid existing rights.	N		
Resource Programs — Invasive Species			
Management Objectives			
Prevent the introduction of invasive species and the spread of existing invasive species infestations.	C, R, O	P, B	EIS Secs. 4.5.1 & 4.5.2 POD Att. N POD Att. W
Management Direction			
Implement measures to prevent, detect, and rapidly control new invasive species infestations.	P, C, R, O	P, B	EIS Secs. 4.5.1 & 4.5.2 POD Att. N POD Att. W
Use manual, mechanical, cultural, chemical, and biological treatments to manage invasive species infestations.	C, R, O	P, B	EIS Secs. 4.5.1 & 4.5.2 POD Att. I POD Att. N POD Att. W
Treat invasive plants and host species for invasive forest pathogens in accordance with the Records of Decision for the Northwest Area Noxious Weed Control Program Environmental Impact Statement and the Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in Oregon Environmental Impact Statement.	C, R, O	P, B	EIS Sec. 1.5 EIS Sec. 4.4.1 POD Att. N POD Att. W
Resource Programs — Lands, Realty, and Roads			
Management Objectives			
Make land tenure adjustments to facilitate the management of resources and enhance public resource values.	N		
Provide legal access to BLM-administered lands and facilities to support resource management programs.	N		
Provide needed rights-of-way, permits, leases, and easements over BLM-administered lands in a manner that is consistent with Federal and State laws.	P	P	EIS Sec. 1.5 EIS Sec. 2.1.3 POD Att. Y
Protect lands that have important resource values or substantial levels of investment by withdrawing them, where necessary, from the implementation of nondiscretionary public land and mineral laws.	N		
Provide a road transportation system that serves resource management needs and casual use needs for both BLM-administered lands and adjacent privately owned lands.	N		

TABLE 1.2-1

Southwestern Oregon Approved Management Actions/Direction – 2016

Element	Applicability	Consistency	EIS Section
Management Direction			
Retain lands in Land Tenure Zone 1 (Zone 1) under BLM administration. Lands in Zone 1 including areas as specified in the RMP.	N		
Make lands in Land Tenure Zone 2 (Zone 2) available for exchange to enhance public resource values, improve management capabilities, or reduce the potential for land use conflict. Lands in Zone 2 are not in the other two Zone categories.	N		
Make lands in Land Tenure Zone 3 (Zone 3) available for disposal using appropriate disposal mechanisms. Lands in Zone 3 include those as specified in the RMP.	N		
Assign to Zone 3 survey hiatuses and unintentional encroachments discovered in the future.	N		
Assign to Zone 3 patented lands with reversionary interests reserved by the United States that are relinquished back to Federal ownership.	N		
Assign to Zone 3 land boundary adjustments due to river movement discovered in the future, which meets the disposal criteria defined in the RMP.	N		
The BLM may dispose of lands designated in Zones 2 and 3 that provide habitat for ESA-listed species, including critical habitat, only following consultation with the U.S. Fish and Wildlife Service or National Marine Fisheries Services and upon a determination that such action is consistent with relevant law and maximizes public resource values.	N		
As required by the Oregon Public Lands Transfer and Protection Act, do not reduce through disposal, exchange, or sale the acres of O&C lands of all classifications, and the acres of O&C and public domain lands that are available for harvesting.	N		
Acquire or dispose of lands to facilitate resource management objectives as opportunities occur. See the Land Tenure Adjustment Criteria section in the RMP.	N		
Make available for disposal the public domain lands in Zones 2 and 3 that have been classified under Section 7 of the Taylor Grazing Act.	N		
Manage newly acquired lands for the purpose for which they were acquired or in a manner that is consistent with management objectives for adjacent BLM-administered lands or other BLM-administered lands having similar resource values.	N		
Where the BLM has administrative responsibility on lands managed by other agencies, the BLM will administer those lands in accordance with interagency agreements.	N		
Issue permits, as identified under the FLPMA for a variety of uses, such as, but not limited to, stockpile and storage sites and as tools to authorize unintentional trespass situations pending final resolution.	N		

TABLE 1.2-1

Southwestern Oregon Approved Management Actions/Direction – 2016

Element	Applicability	Consistency	EIS Section
Do not use land use authorizations for landfills or other waste disposal facilities.	N		
Use land-use authorizations to resolve agricultural or occupancy trespasses, where appropriate.	N		
Recognize existing rights-of-way, permits, leases, and easements as valid uses.	P, R, C, O	P, R	EIS Sec. 4.10.2 POD Att. Y
Limit withdrawals to the area needed and restrict only those activities needed to accomplish the purposes of the withdrawal.	N		
Process formal land withdrawals being relinquished by the BLM or other Federal agency according to the procedures stated under 43 CFR 2372.	N		
Right-of-way exclusion areas include those as described in the RMP such as Wilderness Study Areas and lands designated as Wilderness and other unique areas as specified in the RMP.	P	P, B, R	EIS Secs. 4.7.1-4.7.3 POD Att. T
Right-of-way avoidance areas include those as described in the RMP such as Areas of Critical Environmental Concern and Recreation Management Areas. Only grant right-of-way in avoidance areas if values for which the land was designated are maintained and there are no feasible alternatives.	P	P, B, R	EIS Secs. 4.7.1-4.7.3 POD Att. T
Grant rights-of-way in utility corridors as the preferred location for energy transmission or distribution facilities. Corridors would generally be 1,000 feet on each side of the centerline. Do not conflict with existing utility corridors.	P	P, R	EIS Sec. 1.5 EIS Secs. 4.7.1-4.7.3
Construct communication facilities on existing developed communication sites where they do not conflict with other management objectives. Require a site plan for applications for communication facilities on undeveloped communication sites.	P	P	EIS Sec. 1.5 EIS Secs. 4.7.1-4.7.3 POD Att. D
Expand existing communication sites and develop new sites. Prioritize the use of existing sites and facilities for accommodating the need for additional capacity.	P	P	EIS Sec. 1.5 EIS Secs. 4.7.1-4.7.3 POD Att. D
Construct new permanent or temporary roads, which may include major culverts and bridges, where needed to meet resource management objectives, to established BLM engineering designs standards and apply BMPs.	P, C	P, B	EIS Sec. 4.10.2 POD Att. Y
Maintain existing roads, including major culverts and bridges, to provide access for both resource management and casual use activities while protecting water quality and facility investments, and providing user safety, to established BLM maintenance standards and apply BMPs.	C, O	P, B	EIS Secs. 4.10.1-4.10.3 POD Att. Y
Remove hazard and downed trees along roads for safety or operational reasons.	C, O	P, B	EIS Sec. 4.4.2 POD Att. I POD Att. U
Fully decommission or obliterate roads with no future resource management need. Decommission roads not currently needed for resource management but that will be used and maintained again in the future and apply BMPs.	N		

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Southwestern Oregon Approved Management Actions/Direction – 2016

Element	Applicability	Consistency	EIS Section
Resource Programs — Livestock Grazing			
Not Applicable, Excluded from Table			
Resource Programs — Minerals			
Not Applicable, Excluded from Table			
Resource Programs — Leasable Minerals: Oil, Gas, or Coalbed Natural Gas Resource			
Not Applicable, Excluded from Table			
Resource Programs — Locatable Minerals			
Not Applicable, Excluded from Table			
Resource Programs — Salable Minerals			
Not Applicable, Excluded from Table			
Resource Programs — Paleontological Resources			
Management Objectives			
Protect and preserve significant localities from natural or human-caused deterioration or potential conflict with other resources.	P, C	P, B	EIS Secs. 4.11.1-4.11.3 POD Att. Z
Provide appropriate scientific, educational, and recreational uses, such as research and interpretive opportunities, for paleontological resources.	N		
Management Direction			
Protect all paleontological resources through avoidance or other protection measures, consistent with BLM Handbook 8270-1.	P, C	P, B	EIS Secs. 4.11.1-4.11.3 POD Att. Z
Conduct public education, outreach activities, and develop materials to educate the public on paleontological resources existing within the decision area.	N		
Resource Programs — Rare Plants and Fungi			
Management Objectives			
Provide for conservation and contribute toward the recovery of plant species that are ESA-listed or candidates.	P	P, B	EIS Secs. 4.6.1-4.6.5 EIS App. I POD Att. J
Support the persistence and resilience of natural communities, including those associated with forests, oak woodlands, shrublands, grasslands, cliffs, rock outcrops, talus slopes, meadows, and wetlands.	P	P, B	EIS Sec. 4.4.1 POD Att. I

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Southwestern Oregon Approved Management Actions/Direction – 2016

Element	Applicability	Consistency	EIS Section
Provide for the conservation of Bureau Special Status plant and fungi species.	P	P, B	EIS Secs. 4.6.1-4.6.5 EIS App. I POD Att. J
Support the persistence and resilience of oak species within oak woodlands and within mixed hardwood/conifer communities.	P	P, B	EIS Sec. 4.4.1 POD Att. I
Management Direction			
Manage ESA-listed species consistent with recovery plans, conservation agreements, species management plans, and designated critical habitat and species-specific or project-specific conservation measures developed with USFWS such as habitat protection and action intensity reduction to recover species populations.	P	P, B, R	EIS Sec. 4.6.1-4.6.4 EIS App. I POD Att. J
Manage ESA candidate and Bureau Sensitive species consistent with any conservation agreements or strategies including the protection and restoration of habitat, alteration of the type, timing, and intensity of actions, and other strategies designed to conserve populations of the species.	P	P, C, R	EIS Sec. 4.6.1-4.6.4 EIS App. I POD Att. J
Manage habitat to maintain populations of ESA-listed, proposed, and candidate plant species.	P	P, B, R	EIS Sec. 4.6.1-4.6.4 EIS App. I POD Att. J
Prior to implementing actions that could result in habitat modifications or species disturbance in the suitable habitat of any ESA-listed, proposed, or candidate plant species, or Bureau Sensitive plant species, conduct surveys to determine species presence. Use information on known sites and other details as specified in the RMP.	P	P, B	EIS Sec. 1.5 EIS Secs. 4.6.1-4.6.5 EIS App. I POD Att. J
Maintain or restore natural processes, native species composition, and vegetation structure in natural communities through actions such as applying prescribed fire, thinning, removing encroaching vegetation, and other actions described in the RMP.	N		
When re-vegetating degraded or disturbed areas, utilize locally adapted seeds and native plant materials as specified in the RMP.	R	P, B	EIS Sec. 4.4.1 POD Att. I
Manage mixed hardwood/conifer communities to maintain and enhance oak persistence and structure by removing competing conifers, thinning, and prescribed fire, to the extent consistent with management direction for the land use allocation.	N		
Manage mixed conifer communities to maintain and enhance ponderosa, Jeffrey, and sugar pine persistence and structure by removing competing conifers, thinning, and prescribed fire, to the extent consistent with management direction for the land use allocation.	N		
Create new and augment existing populations of ESA-listed, proposed, and candidate plant species and Bureau Sensitive plant and fungi species to meet recovery plan or conservation objectives.	N		

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Southwestern Oregon Approved Management Actions/Direction – 2016

Element	Applicability	Consistency	EIS Section
Resource Programs — Recreation and Visitor Services			
Not Applicable, Excluded from Table			
Resource Programs — Recreation and Visitor Services-Significant Caves			
Not Applicable, Excluded from Table			
Resource Programs — Recreation and Visitor Services-Formerly Used Defense Sites			
Not Applicable, Excluded from Table			
Resource Programs — Soil Resources			
Management Objectives			
Maintain or enhance the inherent soil functions of managed ecosystems.	N		
Provide landscapes that stay within natural soil stability failure rates during and after management activities.	N		
Management Directions			
Apply BMPs as needed to maintain or restore soil functions and soil quality and limit detrimental soil disturbance.	C, R, O	P, B	EIS Secs. 4.2.1-4.2.3 EIS App. G POD Att. I
Limit detrimental soil disturbance from forest management operations to less than 20 percent of the harvest unit area and apply mitigation if this is exceeded.	N		
Avoid road construction and timber harvest on unstable slopes where there is a high probability to cause a shallow, rapidly moving landslide that would likely damage infrastructure or threaten public safety.	P, C	P, B	EIS Sec. 2.4.2 EIS Sec. 4.1.2 EIS Sec. 4.2.2 EIS Sec. 4.4.2
Do not till soils where tillage will cause soils to become unstable due to increasing the soil moisture content.	R		EIS Secs. 4.2.1-4.2.3 EIS App. G POD Att. I
Resource Programs — Sustainable Energy			
Not Applicable, Excluded from Table			
Resource Programs — Sustainable Energy-Biomass Energy Development			
Not Applicable, Excluded from Table			
Resource Programs — Sustainable Energy-Wind Energy Development			
Not Applicable, Excluded from Table			
Resource Programs — Sustainable Energy-Geothermal Energy Development			
Not Applicable, Excluded from Table			

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Southwestern Oregon Approved Management Actions/Direction – 2016

Element	Applicability	Consistency	EIS Section
Resource Programs — Sustainable Energy-Sustainable Energy Transmission Corridors			
Not Applicable, Excluded from Table			
Resource Programs — Trails and Travel Management			
Not Applicable, Excluded from Table			
Resource Programs — Visual Resource Management			
Management Objectives			
Protect scenic values on public lands where visual resources are an issue or where high-value visual resources exist.	P	R	EIS Sec. 1.5 EIS Sec. 2.4.2 EIS Sec. 4.8.2 EIS App. K
Prohibit activities that would disrupt the existing character of the landscape in Visual Resource Management Class I areas.	P	R	EIS Sec. 1.5 EIS Sec. 2.4.2 EIS Sec. 4.8.2 EIS App. K
Retain the existing character of the landscape in Visual Resource Management Class II areas.	P	R	EIS Sec. 1.5 EIS Sec. 2.4.2 EIS Sec. 4.8.2 EIS App. K
Partially retain the existing character of the landscape in Visual Resource Management Class III areas.	P	R	EIS Sec. 1.5 EIS Sec. 2.4.2 EIS Sec. 4.8.2 EIS App. K
Allow for major modification of the existing character of the landscape in Visual Resource Management Class IV areas.	P, C, R, O	P, B	EIS Sec. 1.5 EIS Sec. 2.4.2 EIS Sec. 4.8.2 EIS App. K
Management Direction			
Only allow activities that are found to meet visual resource management objectives using the Visual Resource Contrast Rating system.	P, C, R, O	P, B, R	EIS Sec. 1.5 EIS Sec. 2.4.2 EIS Sec. 4.8.2 EIS App. K
Visual Resource Management Class I includes areas such as Wilderness Areas and Designated Wild and Scenic Rivers (see RMP for a full list). Manage them in accordance with natural changes and prohibit activities that would lower the class.	N		
Visual Resource Management Class II includes Scenic Rivers and eligible Wild and Scenic Rivers and National Trail Management Corridors (see RMP for a full list). Manage these areas for low levels of change.	N		

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Southwestern Oregon Approved Management Actions/Direction – 2016

Element	Applicability	Consistency	EIS Section
Visual Resource Class III includes Recreational Rivers and Special Recreation Management Areas (see RMP for full list). Manage these areas for moderate levels of change but don't allow changes to dominate the landscape.	N		
Visual Resource Management Class IV includes all other lands not in other classes. Manage these areas for high levels of change and may dominate the landscape.	P, C, R, O	P, B	EIS Sec. 1.5 EIS Sec. 2.4.2 EIS Secs.4.8.1 & 4.8.2 EIS App. K
Resource Programs — Wildlife			
<u>Management Objectives</u>			
Conserve and recover species that are ESA-listed, proposed, or candidates, and the ecosystems on which they depend.	P	P, B	EIS Sec. 1.5 EIS Secs. 4.6.1-4.6.5 EIS App. I POD Att. J POD Att. L
Implement conservation measures that reduce or eliminate threats to Bureau Sensitive species to minimize the likelihood of and need for the ESA listing of these species.	P, C, R, O	P, B, R	EIS Sec. 1.5 EIS Secs. 4.6.1-4.6.5 EIS App. I POD Att. J POD Att. L
Conserve or create habitat for species addressed by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act and ecosystems on which they depend.	P, C, R, O	P, B, R	EIS Sec. 4.5.1 EIS Secs. 4.6.1-4.6.4 EIS App. I
<u>Mangement Direction</u>			
Manage habitat for species that are ESA-listed, or are candidates for listing, consistent with recovery plans, conservation agreements, and designated critical habitat.	P, C, R, O	P, B, R	EIS Sec. 1.5 EIS Secs. 4.6.1-4.6.5 EIS App. I POD Att. J POD Att. L
Implement conservation measures to mitigate specific threats to Bureau Sensitive species during the planning of activities and projects. Conservation measures include altering the type, timing, location, and intensity of management actions.	C, R, O	P, B, R	EIS Sec. 1.5 EIS Secs. 4.6.1-4.6.5 EIS App. I POD Att. J POD Att. L
Utilize information on known sites of ESA-listed wildlife when conducting fire management operations that could result in habitat modification or species disturbance.	N		

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Southwestern Oregon Approved Management Actions/Direction – 2016

Element	Applicability	Consistency	EIS Section
Manage naturally occurring special habitats to maintain their ecological function, such as seeps, springs, wetlands, natural ponds, vernal pools/ponds, natural meadows, rock outcrops, caves, cliffs, talus slopes, mineral licks, oak savannah, woodlands, sand dunes, and marine habitats.	P	P, B	EIS Secs. 4.3.1-4.3.4 EIS Sec. 4.4.1 EIS Secs. 4.5.1 & 4.5.2 EIS Secs. 4.6.1-4.6.5 EIS App. H POD Att. I POD Att. BB
Mange human-made special habitats as wildlife habitat when compatible with their engineered function, such as bridges, buildings, quarries, pump chances/helipons, abandoned mines, and reservoirs to the extent practicable consistent with safety and legal requirements.	P, O	P, B	EIS Secs. 4.3.1-4.3.4 EIS Sec. 4.4.1 EIS Secs. 4.5.1 & 4.5.2 EIS Secs. 4.6.1-4.6.5 POD Att. I POD Att. BB
Klamath Falls Field Office and Medford District: maintain or enhance Bureau Special Status Species wildlife habitat on rangelands.	P	P, B, R	EIS Sec. 1.5 EIS Secs. 4.6.1-4.6.5 EIS App. I POD Att. J POD Att. L
Prior to implementing actions that could result in habitat modification or species disturbance in habitat for the vernal pool fairy shrimp or Oregon spotted frog, conduct surveys to determine species presence.	P	R,	EIS Sec. 1.5 EIS Secs. 4.6.1-4.6.5 EIS App. I POD Att. J POD Att. L
Manage vernal pool fairy shrimp and Oregon spotted frog consistency with recovery plans, conservation agreements, designated critical habitat, and species-specific and project-specific conservation measures developed with USFWS. Do approve for fund actions that would adversely affect vernal pool fairy shrimp or Oregon spotted frog, except when done in accordance with an approved plan or necessary for species conservation.	N		
Manage designated or proposed critical habitat for the vernal pool fairy shrimp and Oregon spotted frog consistent with recovery plans, conservation agreements, designated critical habitat, and species-specific and project-specific conservation measures developed with USFWS. Do no approve or fund actions that would adversely affect designated or proposed critical habitat for these species except if in agreement with an approved plan or for species conservation.	N		
Resource Programs — Wildlife: Bald and Golden Eagles			
Protect known bald eagle or golden eagle nests and bald eagle winter roosting areas. Prohibit activities that will disrupt bald eagles or golden eagles that are actively nesting. See RMP for activity allowances and prohibitions.	P, C, R, O	P, B	EIS Sec. 1.5 EIS Secs. 4.6.1-4.6.5

TABLE 1.2-1

Southwestern Oregon Approved Management Actions/Direction – 2016

Element	Applicability	Consistency	EIS Section
Resource Programs — Wildlife: Bats			
Protect known maternity colonies and hibernacula for Bureau Sensitive bat species within caves, mines, bridges, and buildings with a 250-foot buffer. See RMP for specific prohibitions.	P, C, O	P, B	EIS Sec. 1.5 EIS Sec. 4.6.4
Prohibit blasting during periods of reproduction and hibernation within 1 mile of known maternity colonies and hibernacula for Bureau Sensitive bat species within caves, abandoned mines, bridges, and buildings.	C	P, B	EIS Sec. 1.5 EIS Secs. 2.4.1 & 2.4.2 EIS Sec. 4.6.4
Where white-nose syndrome is found in the bats residing within caves, abandoned mines, bridges, and buildings, prohibit human access except for monitoring, education, or research purposes.	N		
Resource Programs — Wildlife: Deer or Elk Management Area (Klamath Falls Field Office and Medford District)			
Not Applicable, Excluded from Table			
Resource Programs — Wildlife: Fisher			
Do not approve, fund, or carry out actions that would disrupt normal fisher behaviors associated with known natal or maternal denning sites, except when done in accordance with an approved recovery plan or other applicable plan or strategy and when the action is necessary for conservation.	P	R	EIS Sec. 1.5 EIS Sec. 4.6.1
Manage known natal or maternal denning sites in a manner that would not adversely affect fisher. Conduct canopy cover specifications and denning structure protection as described in the RMP.	P	R	EIS Sec. 1.5 EIS Sec. 4.6.1
Within 5th field-watersheds (HUC 10) where fisher are documented by the BLM to occur, favor retaining trees that have structures that are typically used as denning or resting sites by fisher.	P	R	EIS Sec. 1.5 EIS Sec. 4.4.2 EIS Sec. 4.6.1 POD Att. P POD Att. U
Resource Programs — Wildlife: Gray Wolf			
Restrict activities that create noise or visual disturbance(s) above ambient conditions within one mile of known active gray wolf dens from April 1 to July 15.	P, C, R, O	P, B	EIS Sec.1.5 EIS Sec. 4.6.1 POD Att. B
In accordance with 43 CFR 4110, modify grazing leases, as appropriate, to include measures specified in the RMP when the USFWS determines gray wolf occupancy of a BLM grazing allotment and recommends the implementation of these measures as part of its wolf conservation strategy.	N		

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Southwestern Oregon Approved Management Actions/Direction – 2016

Element	Applicability	Consistency	EIS Section
Resource Programs — Wildlife: Marbled Murrelet			
Except as stated under Option 3 (see RMP), and except when needed to protect human safety and property, prohibit activities that disrupt marbled murrelet nesting at occupied sites when conducting activities within all land uses allocations within 35 miles of the Pacific Coast and when conducting activities within reserved land use allocations between 35-50 miles of the Pacific Coast.	P, C, R, O	A	Amendment-District Designated Reserve EIS Section 2.1.3.1
Before modifying nesting habitat or removing nesting structure in all land use allocations within 35 miles of the Pacific Coast and in LSR/RR between 35-50 miles of the Pacific Coast and outside of exclusion areas C and D (see RMP), assess the analysis area for marbled murrelet nesting structure. See RMP for nesting analysis structure and options for surveys and protection.	P	A	EIS Sec. 4.6.1-4.6.4 Amendment-District Designated Reserve EIS Section 2.1.3.1
Resource Programs — Wildlife: Northern Spotted Owl			
Manage habitat conditions for northern spotted owl movement and survival between and through large blocks of northern spotted owl nesting-roosting habitat.	P	P	
Do not authorize timber sales that would cause the incidental take of northern spotted owl territorial pairs or resident singles from timber harvest until implementation of a barred owl management program consistent with the assumptions contained in the Biological Opinion on the RMP has begun.	N		
Resource Programs — Wildlife: Oregon Spotted Frog			
Manage livestock grazing at sites occupied by Oregon spotted frogs to prevent direct impacts to eggs, tadpoles, or adults.	N		
Resource Programs — Wildlife: Siskiyou Mountains Salamander			
Not Applicable, Excluded from Table			
Resource Programs — Wildlife: Vernal Pool Fairy Shrimp			
Do not authorize or construct additional discretionary roads and trails within designated critical habitat for the vernal pool fairy shrimp or within vernal pool fairy shrimp habitat.	P	R	EIS Sec. 1.5 EIS Secs. 4.6.1-4.6.5 EIS Secs. 4.10.1-4.10.2 POD Att. Y
Resource Programs — Wildlife: Wild Horses			
Not Applicable, Excluded from Table			

2.0 LAND AND RESOURCE MANAGEMENT PLAN CONSISTENCY EVALUATIONS FOR THE UMPQUA, ROGUE RIVER AND WINEMA NATIONAL FORESTS

Actions on national forest system (NFS) must be consistent with the Land and Resource Management Plan (LRMP) of the administrative unit where the action occurs. This appendix provides a series of tables that document independent agency consistency evaluations of the Pacific Connector pipeline with management direction for the LRMPs of the Rogue River, Umpqua and Winema National Forests.

Each table is organized to list relevant components of the respective RMP or LRMP. For each element, a determination was made regarding (1) its applicability to the Project, (2) the consistency of the Project with the element, and (3) in each table for each relevant element are the portion or portions of the DEIS that address the standard (expressed as EIS sections, EIS appendices, and POD attachments). Column four identifies the specific LRMP amendment that would be required. Where certain sections of the LRMP are not applicable, specific elements have been excluded to reduce the size of the tables (e.g., Adaptive Management Areas).

On each table, the specific elements are presented in column one by LRMP section (topic). In column two ("Applicable") of each table, the applicability of each element was identified by relevant stage or stages of the PCGP Project as follows:

P	Pre-construction
C	Construction
R	Restoration (includes offsite mitigation actions)
O	Operation
N	Not Applicable to any stage

The consistency of each relevant element is expressed in column three ("Consistent") of each table as follows:

P	Consistent via agency-approved plans, designs & procedures
B	Consistent via application of BMPs
R	Consistent via route selection
A	Inconsistent, LRMP amendment required

The majority of the relevant standards consistency is by adherence to more than one consistency criterion. In such cases, the codes are presented as above. Included for each relevant element in column four of each table ("Comments") is the portion or portions of the DEIS that address the element, expressed as follows:

- EIS section
- EIS appendix

- POD attachment (note references to these attachments was revised to use a letter consistent with applicant filing)

For each inconsistent Project action, the LRMP plan amendment required to address the standard is specifically identified in column four.

2.1 UMPQUA NATIONAL FOREST LAND AND RESOURCE MANAGEMENT PLAN - 1990

Project consistency with this LRMP is addressed in Table 2.1-1 below.

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Recreation			
Developed Recreation: Evaluate and authorize service by the private sector on National Forest lands that complement National Forest objectives.	N		
Developed Recreation: New recreation residence sites will not be permitted, except as allowed by Forest Service regulations.	N		
Developed Recreation: Consider the needs of elderly and physically challenged users in all construction or reconstruction of developed facilities in accordance with FSM direction.	N		
Developed Recreation: Continue to use sampling at developed sites as funds permit to determine visitor origin, extent of use and kinds of activities.	N		
Developed Recreation: Sites will be administered and maintained to provide visitor safety, sanitation, and protection of facility and site resources.	N		
Developed Recreation: Sites shall be managed to the following ROS classes: rural at Diamond Lake fee sites; roaded natural at non-fee developed sites; roaded natural on the remainder of the Forest.	N		
Developed Recreation: Existing sites shall be maintained or reconstructed to assigned ROS standards.	N		
Developed Recreation: Potential developed sites and acres shown in List IV-2[1] and on the accompanying inventory map in the map packet shall be reserved for recreation occupancy and managed to the following standards: The ROS direction for both the existing and future condition shall be (1) rural for Diamond Lake sites; (2) roaded natural for Lemolo, Clearwater, North Umpqua River corridor, Little River, South Umpqua, and Brice/Sharps; and (3) roaded modified for other North Umpqua Ranger District sites.	N		
Developed Recreation: Potential developed sites and acres shown in List IV-2[1] and on the accompanying inventory map in the map packet shall be reserved for recreation occupancy and managed to the following standards: Visual resource direction within the sites shall be partial retention and views from the sites will be managed to the sensitivity level of the corridor in which they are located.	N		

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[1] List IV-2: Potential Developed Sites, Umpqua National Forest Land And Resource Management Plan

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Developed Recreation: Potential developed sites and acres shown in List IV-2[1] and on the accompanying inventory map in the map packet shall be reserved for recreation occupancy and managed to the following standards: Conceptual site plans shall be approved before any resource development occurs. Roads developed by projects shall be located to serve the planned recreation use as well as other resource needs. Mature and old growth timber may only be removed selectively to make the site safe for recreation occupancy. There will be no programmed salvage or harvest on these sites. Young conifers and hardwoods shall be utilized as necessary to provide future campsite screening and visually attractive cover.	N		
Developed Recreation: Recreation old growth groves and acres shown in List IV-3[2] shall be managed to provide for their high interpretive values.	N		
Dispersed Roaded and Unroaded Recreation: Emphasize “pack-in/pack-out” policy to reduce management costs and resource impacts.	N		
Dispersed Roaded and Unroaded Recreation: List IV-4[3] displays roaded dispersed sites, special features and acres inventoried within roaded modified ROS forest settings. The management direction for these sites is: Manage to ROS roaded natural.	N		
Dispersed Roaded and Unroaded Recreation: List IV-4 [3]displays roaded dispersed sites, special features and acres inventoried within roaded modified ROS forest settings. The management direction for these sites is: Visual quality objective is modification in foreground seen areas and partial retention within the site and along the access trail.	N		
Dispersed Roaded and Unroaded Recreation: List IV-4[3] displays roaded dispersed sites, special features and acres inventoried within roaded modified ROS forest settings. The management direction for these sites is: Programmed harvest which meets the visual requirements is allowed.	N		
Dispersed Roaded and Unroaded Recreation: List IV-4[3] displays roaded dispersed sites, special features and acres inventoried within roaded modified ROS forest settings. The management direction for these sites is: Timber management activities (sale location, scheduling, harvest, timber stand improvement actions) should provide for the protection of activities that attract recreationists, such as huckleberry picking or wildlife viewing.	N		

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[2] List IV-3: Recreation Old Growth Groves Inventory, Umpqua National Forest Land And Resource Management Plan

[3] List IV-4: Roaded Dispersed Recreation Sites and Special Features, Umpqua National Forest Land And Resource Management Plan

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Dispersed Roaded and Unroaded Recreation: The Oregon Cascades Recreation Area (OCRA) shall be jointly managed by the Deschutes, Willamette and Umpqua National Forests as directed by the management plan shown in Appendix E[4], and SPM no harvest and SPNM no harvest.	N		
Dispersed Roaded and Unroaded Recreation: Unroaded recreation management areas (URMA - MA1) shall be managed in accordance with SPM-no harvest, SPNM-no harvest and unroaded concentrated direction.	N		
Dispersed Roaded and Unroaded Recreation: Special interest areas shown in List IV-5[5] shall be managed for public recreation emphasizing their special values.	N		
Layng Creek Watershed: Overnight camping, swimming and developed recreation sites will not be allowed.	N		
Layng Creek Watershed: Dispersed day use is permitted, but increased usage shall not be encouraged.	N		
Layng Creek Watershed: Control recreational vehicle use on roads during wet periods through a travel management plan. In the interim, wet-period travel will be restricted to paved or rocked roads.	N		
Layng Creek Watershed: ROS class for the Layng Creek municipal watershed is roaded modified, except for a portion of Hardesty Mountain, which is semi-primitive non-motorized.	N		
Off-Road Vehicles: Provide opportunities for ORV use on appropriate National Forest System lands. The use of off-road vehicles on the Forest shall conform to guidance in EO 11644 as amended by EO 11989 (FSM 2355.01) and Appendix F[6].	N		
Off-Road Vehicles: Manage ORV use to minimize: a) disturbance to Wildlife habitat, b) recreation use conflicts, c) damage to soil and water resources, and d) damage to vegetation.	P, C, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.7.2 EIS Sec. 2.8 EIS Secs. 4.2.2.1 & 4.2.2.5 EIS Sec. 4.2.3 EIS Sec. 4.4.1.3 EIS Secs. 4.5.1.3 & 4.5.2.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Sec. 4.8.2.3 EIS Secs. 4.10.2.5 & 4.10.2.6 POD Att. I POD Att. S POD Att. Y

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[4] Appendix E: Oregon Cascades Recreation Area Management Plan, Umpqua National Forest Land And Resource Management

[5] List IV-5: Special Interest Areas, Umpqua National Forest Land And Resource Management Plan

[6] Appendix F: Recreation Travelway Management Guide, Umpqua National Forest Land And Resource Management Plan

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Off-Road Vehicles: Site-specific recreational vehicle use will be in accordance with Appendix F[6], titled Recreation Travelway Management Guide This document is a summary of prescriptive direction for motorized and non-motorized vehicles. Also see the Facilities (Transportation) standards and guidelines for additional discussion of road use, including licensing requirements.	N		
Off-Road Vehicles: A travel management plan will be prepared within three years of signature of the Forest Plan and will specify closures and restrictions of use on non-roaded areas, roads, and trails based on the broad direction summarized in Appendix F[6] in the Forest Plan.	N		
Off-Road Vehicles: Vehicle travel off roads is prohibited in the Layng Creek municipal watershed.	N		
Trails Selected potential trail corridors, shown on the inventory map on file in the Supervisor's Office, shall be given consideration for their integrity during ground-disturbing activities and management direction for the area. Those corridors will be cleared of any debris and slash caused by industrial activities.	N		
Trails Existing system trail tread must be relocated, reconstructed or restored after logging activities are concluded Logging slash will be cleaned up and signing restored.	N		
Trails In programming construction and reconstruction of trails, priorities shall be based in part on estimated use, public demand, other resource compatibility and ROS needs.	N		
Trails Full trail management for hikers will be allowed on existing system trails in the Layng Creek municipal watershed.	N		
Visual Resources			
Direction on the assignment of VQO's is contained in Management Area descriptions. Additional Visual resource direction for some recreation inventories is located in forestwide recreation standards and guidelines.	N		

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
The Visual resource is defined by visual inventory units which are an aggregation of three inventory components: Distance Zone fg – foreground mg – middleground bg – background Sensitivity Level 1 – highest sensitivity 2 – average sensitivity 3 – low sensitivity Variety Class A – distinctive B – common C – minimal The sensitivity level assignments of routes, use areas and waterbodies on the Forest are shown in list IV-6 [7]and on the Forest Plan Inventory Map at the National Forest Headquarters. Routes and use areas within Management Areas 1 and 6 allocated in the Forest Plan but not shown in the inventory of sensitive routes, water bodies, and use areas shall be assigned Sensitivity Level 2. Exterior views from use areas, routes and waterbodies within these management areas shall be managed in accordance with specific direction in contained in Management Area Descriptions.	N		
Minimum Level: The minimum acceptable level of Visual quality shall be 'maximum modification.'	N		
<u>Exception/Mitigation:</u> Proposed exceptions to meeting assigned VQOs will be identified through project environmental analysis and amendment procedures described in Forest Plan Chapter Five. Examples of some exceptions are areas where past management practices make it impractical to meet the adopted visual quality objectives (VQO), or areas where catastrophic loss is imminent or has occurred. Visual mitigation measures shall be developed for areas when VQOs are not met so that projected future visual conditions are consistent with the Forest Plan. Mitigation measures also include visual rehabilitation considerations for landscapes which presently do not meet assigned Visual quality objectives. Rehabilitation is described in Department of Agriculture Handbook 462.	P, R	P, B	EIS Sec. 4.8.1.3 EIS Sec. 4.8.2.2 & 4.8.2.3 POD Att. A
<u>Duration of Visual Impact:</u> The duration objective pertaining to ground disturbance shown in Agriculture Handbook 462 for retention shall be modified to be the same as partial retention. Within R and PR objective areas, duration shall be an evaluation criterion during project environmental analysis Management techniques shall be explored during the analysis process to attain duration objectives.	N		

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[7] List IV-6 : Inventory of Sensitivity Level 1 and 2 Routes, Water Bodies and Use Areas, Umpqua National Forest Land And Resource Management Plan

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Created Openings: Created openings (timber harvest Units) shall be shaped and blended to the extent practicable with the natural terrain. Openings shall be located to achieve the desired combination of multiple use considerations. A harvest unit will no longer be considered a created opening for Visual resource purposes when the stand averages 20 feet tall in foreground and middleground distance zones. In background distance zone the average height of vegetation shall be 4.5 feet. Table IV-1[8] describes the standards for each visual quality objective. Regeneration harvest shall be scheduled at an even and fair share rate Within viewsheds as shown in the 'Maximum % Created Openings at Any One Time' column.	N		
Visual Enhancement: Visual enhancement, as described in Department of Agriculture Handbook 462, shall be routinely considered in applicable landscapes, consistent with other resource standards and guidelines.	N		
Visual Diversity: Where a suitable environment exists, hardwood species should be retained or planted as a minor component of the stand on Sensitivity Level 1 and 2 routes after ground-disturbing activities. Seed grass to create temporary openings on some regeneration units occurring within 300 feet of those sensitive routes.	N		
Viewshed Planning: Viewshed (corridor) plans will be developed on Sensitivity Level 1 and 2 routes. USDA Handbook 559 and other accepted reference works or field models shall be used as guidance.	N		
Activity Slash: Activity slash within viewsheds shall be treated commensurate with the VQO. Areas within 500 feet of sensitive routes shall have high priority for treatment viewsheds should be treated in a manner that avoids soil color contrast or denudation of the site. Slash treatment shall meet the general landscape management guidelines stated in Agriculture Handbooks 462 and 608, applicable fuels handbooks, fire and soils guidelines in this document, and best field experience.	N		
Recreation Access Routes: The views from the Recreational Access Routes inventory shown in the List IV-7 [9]shall be managed as priority for visual enhancement and rehabilitation. Those Sensitivity Level 3 routes shall be afforded an extra degree of sensitive treatment within the foreground ordinarily not applied to other Level 3 routes.	N		
Scenic Byways Program: The Forest shall actively cooperate in nominating existing highly scenic roadways to the Chief for inclusion in the National Forest Scenic Byways Program.	N		
Wild/Scenic/Recreation Rivers			
Not Applicable, Excluded from Table			

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[8] Table IV-1: Standards of Visual Quality Objectives, Umpqua National Forest Land And Resource Management Plan

[9] List IV-7: Recreational Access Routes, Umpqua National Forest Land And Resource Management Plan

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Cultural Resources			
Inventory all areas where ground-disturbing activities are planned in order to discover all reasonably locatable cultural resources.	P	P	EIS Sec. 1.5 EIS Sec. 4.11.1.1 EIS Secs. 4.11.3.2 & 4.11.3.3 EIS Sec. 4.11.5
Evaluate all sites discovered during reconnaissance against the criteria for eligibility to the National Register of Historic Places. A plan will be developed within three years of the Record of Decision (ROD) to evaluate all other cultural resources by theme groups, agreements, or other cost-effective means as the Forestwide cultural resource inventory of the Umpqua NF nears completion. Results of the survey and evaluation of any discovered cultural resources will be sent to the State Historic Preservation Officer (SHPO) office. Documentation will be included in the project environmental analyses, in compliance with NHPA and NEPA.	P	P	EIS Sec. 1.5 EIS Sec. 4.11.1.1 EIS Sec. 4.11.2 EIS Secs. 4.11.3.2 & 4.11.3.3 EIS Sec. 4.11.5
Nominations will be scheduled incidentally or thematically until completion of the Forest-wide inventory of cultural resources. Nominate cultural resources that meet the appropriate criteria to the National Register of Historic Places.	N		
Protect the resources considered eligible for the National Register of Historic Places by (a) making reasonable efforts to avoid adverse Impacts to the resources or (b) developing a procedure to conserve the values through proper scientific study. Protection plans may include physical protection such as fences and bafflers, scientific study and collection, patrol, and site motoring, proper use or removal of signs, maintaining site anonymity, and/or increasing public understanding and support through education. Protect eligible cultural resources from vandalism and natural destruction. Cultural resource management will ensure that significant properties (and the records which document them) are protected from unauthorized uses and possible degradation of the resource. Protection and management of traditional Native American religious uses will be coordinated with Native American groups, most notably the Cow Creek Band of Umpqua Indians.	P, C, O	P, R	EIS Sec. 1.5 EIS Sec. 4.11.1.1 EIS Secs. 4.11.3.2 & 4.11.3.3 EIS Secs. 4.11.4 & 4.11.5 POD Att. Z
Decisions on the maintenance level for eligible historic structures will be based on an analysis of Utility, Interpretive value, public Interest, existing site or area allocation, funding sources, existing agreements, etc. Eligible historic uses will be maintained or the resultant adverse effect will be mitigated.	N		
Displays, Interpretive trails, video and audio recordings, brochures, tours, and signing are appropriate Interpretive means. Cultural resource sites may be developed for educational purposes to the extent that the integrity of the resource is maintained. Use will be carefully monitored to prevent degradation.	N		
Assign cultural resources to appropriate management categories for present and future uses such as Interpretation, scientific Investigation, adaptive uses, and preservation In place for developing future scientific needs.	N		

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wilderness			
Not Applicable, Excluded from Table			
Fisheries			
Maintain all effective shading vegetation on perennial streams. Utilize silvicultural practices to establish shade on perennial streams where currently lacking.	P, C, R, O	P, B, A	EIS Sec. 2.1.3.3 EIS Sec. 2.4.2.1 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS Sec. 4.14.3.1 EIS App. F.4EIS App. F.4 POD Att. I LRMP Amendment UNF-1
Maintain or improve soil stability adjacent to all streams. When slope stability risks are high or very high, use stability buffer specifications found In Standard and Guideline Number 4, under the Soil Productivity Section.	P, C, R, O	P, B	EIS Sec. 2.4.2.2 EIS Sec. 4.1.3.1 EIS Sec. 4.2.3.1 POD Att. I POD Att. BB
Retain all existing instream large woody material, streamside snags, and streamside downed material within riparian areas of perennial streams (Class I, II, and III streams) that will not create a blockage to fish passage. Retain standing trees which are likely to fall into the stream In the future.	P, C, R, O	P, B,	EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Sec. 4.7.3.5 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.5.2.4 EIS App. F.4EIS App. F.4 POD Att. P POD Att. 20 POD Att. BB POD Att. DD
Protect riparian area from prescribed fire and equipment when treating slash in adjacent harvest unit where practical.	N		
Fall timber directionally away from riparian areas to protect full width of residual vegetation where practical.	C, O	B	EIS Sec. 2.7.2 EIS Secs. 4.4.2.2 & 4.4.2.3 POD Att. U
Do not apply pesticides within the riparian area.	C, O	B	EIS Sec. 2.8 EIS Sec. 4.7.3.5 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS App. F.4EIS App. F.4 POD Att. N
All fish-producing streams (Class I and II) will be Inventoried Within ten years of signature of the Record of Decision for this Forest Plan, using the sub-basin analysis procedure and With limiting factors determined.	N		

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Streams or portions of streams, where fish production is demonstrably below potential due to habitat restrictions, will be rehabilitated using whatever measures are appropriate based on the analysis. Some examples are riparian plantings, blasting of pools, off-channel developments, fish passage projects, and instream structures Develop fish habitat enhancement plans for all Class I streams within two years of completion of the sub-basin analysis.	P, R	P,	EIS Sec. 2.1.4 EIS Sec. 4.7.3.5 EIS Sec. 4.3.2.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Secs. 4.5.2.3 & 4.5.2.4 EIS App. F.4 POD Att. DD
Keep total fine sediment (<1. 0 millimeter) to less than 20 percent by weight in spawning gravels.	P, C, R, O	P, B,	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.3.2.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Secs. 4.5.2.3 & 4.5.2.4 POD Att. I POD Att. BB POD Att. DD
Design new stream crossings to provide for unimpeded fish passage and correct existing passage problems on a prioritized schedule.	P, R	P,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Sec. 4.7.3.5 EIS App. F.4EIS App. F.4 POD Att. BB POD Att. DD
Encourage KV collection for fish habitat improvement projects by including stream reaches and potential pond sites within timber sale area boundaries. The locations and types of stream improvements shall be based on the sub-basin analysis procedure where such analysis is completed.	N		
Locate new roads outside riparian areas; preferably on ridgetops, except where a stream crossing is necessary. Road reconstruction should not further degrade riparian areas.	P, C, R, O	P, B, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.7.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.4 POD Att. I POD Att. Y
Wildlife Habitat And Threatened, Endangered, or Sensitive Species			
Woody material (slash) to provide wildlife cover will be retained on 10 percent of the area of all regeneration harvest units. (Not applicable to 500 feet each Side of visual Sensitivity Level 1 and 2 routes.)	P,R, C	P,B,R	EIS Sec 4.5.1.2 POD Att. I
Down, dead woody material (20 feet or more in length) and a minimum of 12 Inches in diameter at the small end) will be left at the rate of two per acre on each unit that is regeneration harvested. Additional material will be left when logs have little or no commercial value and do not produce an unacceptable fire hazard.	P,R,C	P,B,R	EIS Sec 4.5.1.2 POD Att. I

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Harvest units shall be designed with Irregular shapes or boundaries, to the extent practicable, to increase the amount of edge habitat. (Refer to Visual standards and guidelines.)	N		
Native hardwood trees or tree-like shrubs will be maintained on at least 10 percent of the area on all regeneration harvest and commercial/pre-commercial thinning units. This standard applies in areas where hardwoods are a natural component of conifer stands and is intended to ensure that hardwoods will continue to be represented in the regenerating conifer stands. If mature conifers are not retained, an adequate hardwood reproduction will be protected during the various cultural treatments. (Refer to Visual standards and guidelines.)	N		
Established big game travel lanes will not have their character altered through precommercial thinning.	N		
Any management activity that will negatively affect plant or animal species listed on the Regional Forester's Sensitive Species list, or their habitat will be modified to either avoid (preferable) or minimize the impact. Activities will not be permitted If they will result in the loss of a colony or subpopulation that is important In the natural distribution of the species.	P, C, R, O	P, B, R	EIS Sec. 3.4.3 EIS Sec. 4.5.1.3 EIS Sec. 4.5.2.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7
Activities will not be permitted that damage the plants or growing site of those species listed as Category 2 plants In the 1985 or subsequent Plant Notice of Review, USDI Fish and Wildlife Service.	N		
Active raptor nest sites identified In project planning or during project work should be protected from human disturbance until fledging or nesting is complete (see prescriptions and other standards for threatened, endangered or sensitive raptors)	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.4.1 - 4.6.4.4 EIS App. F.7
All proposed activities within areas designated for management under the bald eagle or peregrine falcon prescription will first be coordinated With the USDI Fish and Wildlife Service as required by consultation procedures.	P	P	EIS Sec. 1.5 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4
If additional sites occupied by a species classified as threatened or endangered under the Endangered Species Act of 1974 are discovered, these sites will be managed as directed by the appropriate recovery plan or draft recovery plan. Any activity that may Impact the species will be coordinated with the USDI Fish and Wildlife Service as required by consultation procedures.	P, C, O	P, B, R	EIS Sec. 1.5 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 POD Att. J POD Att. L
Activities that may impact species listed as threatened or endangered by the State of Oregon will be submitted for review to the Oregon Department of Agriculture (plants) or the Oregon Department of Fish and Wildlife (animals).	P	P	EIS Sec. 1.5 EIS Sec. 4.6.3.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 POD Att. J POD Att. L

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
The Forest will consult and cooperate with the USDI Fish and Wildlife Service, the Oregon Department of Fish and Wildlife, and/or the Oregon Department of Agriculture to prepare 'species guides', or Similar references, for selected species. Guides will contain goals and management direction based on the distribution and biology of the species and will provide guidance In such a manner as to not Impair existence of, or recovery of, any threatened or endangered species.	N		
Pileated Woodpecker Habitats - Provide one habitat area for every 12,000 to 13,000 acres of suitable habitat. Habitats will be distributed In such a way that any given habitat unit will be connected to two or more other Suitable habitats. For a description of the habitat requirements see Prescription C5-VII (pileated woodpecker).	N		
Pine Marten Habitats - Provide one habitat area for every 4,000 to 5,000 acres of suitable habitat. Habitat will be distributed in such a way that any given habitat unit will be connected to two or more other suitable habitats. For a description of the habitat requirements see Prescriptions C5-IX and C5-X (pine marten).	N		
Nesting, non-network (FEIS) northern spotted owl pairs will be protected during timber harvest by deferring harvest within a five-chain radius of the nest tree. Additionally, activities such as road construction, felling and yarding within a ten-chain radius of an active next tree will not occur between April 1 through August 15, annually. If a nest remains unoccupied for five consecutive years, these restrictions will no longer apply	N		
Stage 6 vegetation - Within each RSA, efforts should be made to retain 10 percent of the acreage In Stage 6 vegetation. In preparing and evaluating timber sale alternatives, consideration should be given to the conservation of large contiguous stands of Stage 6 vegetation, 15 acres or greater.	N		
When planning timber sales in Important big game areas, a habitat effectiveness model (A Model to Evaluate Elk Habitat in Western Oregon' or similar model) will be used to compare the Impact of various alternatives on big game habitat	N		
When possible, wildlife trees (snags and green culls) will be left standing in areas of timber harvest. This habitat will be in addition to that provided by Implementing the snag habitat prescriptions.	N		
Range			
Not Applicable, Excluded From Table			
Timber/Vegetation Management			
Not Applicable, Excluded From Table			

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Water Quality/Riparian Areas			
Forestwide Resource Programs: All effective shading vegetation will be maintained on perennial streams (Class I, II, or III), unless a site-specific assessment shows that shade removal will not result in water temperature Increase or aquatic habitat degradation on downstream fish-producing streams. Shade may be removed from nonfishery (Class III) streams with July low flow less than 1/2 inch deep, on any stream reach farther than 1/2 mile from a fish- producing stream (Class I or II). This exception must be determined for each stream, and be consistent with other riparian objectives. (See Water Temperature Guidelines for Small Streams, in 'Umpqua National Forest Standard and Guideline Procedures for Watershed Cumulative Effects and Water Quality' stored in the Umpqua National Forest Planning Record.	P, C, R, O	P, B, A	EIS Sec. 2.1.3.3 EIS Sec. 2.4.2.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.5.2.4 EIS Sec. 4.14.3.1 EIS App. F.4 POD Att. I POD Att. BB LRMP Amendment UNF-1
Forestwide Resource Programs: Existing and Introduced woody material will be maintained In streams except when: 1) the material will float downstream and cause unacceptable damage during a 25-year flow event, or 2) the woody material contributes to unacceptable turbidity, dissolved oxygen, or other water quality Impacts which outweigh benefits of the wood to fish habitat or channel stability (reference 'Guidelines for the Management of Woody Material in Small Channels,' in 'Umpqua National Forest Standard and Guideline Procedures for Watershed Cumulative Effects and Water Quality' stored In the Umpqua National Forest Planning Record. Woody material, Including slash from timber harvest activities, will not usually be removed from streams with a drainage area of 100 acres or less (for example, timber sale contract clause C6.5).	P, C, R, O	P, B	EIS Sec.2.4.2.2 EIS Sec. 4.7.3.5 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.5.2.4 POD Att. BB EIS App.
Forestwide Resource Programs: Down and stable woody material, including tree boles, roots, and limbs will not be removed from perennial streams (Class I, II, and III) except on the recommendation of a fishery biologist or hydrologist. Where timber harvest occurs in riparian areas of any stream, stable unmerchantable wood affecting the flood channel or hills lope stability will not be yarded.	P, C, R, O	P, B	EIS Sec.2.4.2.2 EIS Sec. 4.7.3.5 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.5.2.4 POD Att. BB EIS App. F.4
Forestwide Resource Programs: The entry of large stable wood Into fish-producing (Class I and II) streams will be maintained or Increased by maintaining standing trees (green, dying, or dead) which are likely to reach the water when they fall. Some standing trees will be left on other streams (Class III and IV) where necessary to maintain a source of large woody material.	P, C, R, O	P, B	EIS Secs. 2.4.2.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.5.2.4 POD Att. 16 POD Att. U POD Att. BB
Forestwide Resource Programs: Stream course protection will be used instead of mitigation, to maintain water quality. Stream channels with a defined bank and at least seasonal surface flow will be designated for stream course protection on timber sale area maps (for example Timber Sale Contract Clause B6.5) during timber harvest, and will be provided similar protection during other management activities. Logs should be fully suspended when yarded or hauled across protected stream courses, except at designated crossings.	P, C, O	P, B	EIS Sec. 2.3.2.3 EIS Sec. 2.4.2.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.5.2.4 POD Att. BB

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Forestwide Resource Programs: Directional failing methods will be used, where effective, to meet riparian objectives during timber harvest (for example, timber sale contract clauses C6.51 and C641).	N		
Forestwide Resource Programs: Vegetation and dead woody material in riparian units (Class I, II, III, and IV streams) will be protected from prescribed fire. Where mitigation is more effective than protecting seasonal (Class IV) streams, stable woody material (plus seeding and planting) will be used to mitigate temporary soil erosion and ravel. Mitigation will be planned and effectively implemented before the runoff season which follows project activities. Mitigation should not be planned in lieu of protection where Fish Habitat prescriptions including C2-IV, VI and C2-X apply.	P, C, R, O	P, B,	EIS Sec. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.1.4 EIS Sec. 4.7.3.5 EIS Sec. 4.4.2.3 EIS App. F.4 EIS App. H POD Att. I POD Att. R POD Att. BB POD Att. DD
Forestwide Resource Programs: Pesticides and fertilizer will not be used in riparian units, except along seasonal (Class IV) streams during the season when flow does not occur. Herbicides will be applied in a manner which protects vegetation necessary for meeting riparian objectives.	P, C, R, O	P, B	EIS Sec. 2.8 EIS Sec. 4.7.3.5 EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Sec. 4.5.1.2 EIS Secs. 4.5.2.3 & 4.5.2.4 EIS App. F.4 POD Att. I POD Att. N POD Att. X
Forestwide Resource Programs: Forest Service transportation of pesticides, petroleum products, dust palliatives, fertilizers, and other potentially hazardous materials will follow procedures of the Umpqua National Forest Spill Prevention and Response Plan.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.4.1.3 POD Att. I POD Att. X
Forestwide Resource Programs: Site preparation, release, and precommercial thinning will not be applied in riparian units along perennial streams, except to meet riparian objectives. Usually no precommercial thinning will be done within an average of 100 feet of fish-producing streams or within 50 feet of other perennial streams. (See riparian prescriptions for specific distances.)	P, C, R, O	P, B, R,	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.4.2.3 EIS App. F.4 POD Att. I POD Att. U POD Att. BB POD Att. DD

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Forestwide Resource Programs: Streams In the Steamboat Management Area will be designated for stream course protection In timber sale area maps and will display stream class (I, II, III, or IV) and riparian risk (a, b, or c), as shown In Table IV-14[10], Protection Requirements for Stream courses and Riparian Areas Within the Steamboat Management Area Risk to riparian objectives will be assigned during environmental analysis, based on mass movement potential and difficulty in protecting riparian vegetation during timber harvest or Similar activity. Low risk Class Ic-IIIc streams are assigned fish habitat prescription C2-IV and no-harvest C2-IX. Low risk Class IVc streams are assigned harvest fish habitat prescription C2-VI High risk streams (a) are protected by soil productivity standard #7. Moderate risk streams (b) are protected by soil productivity standard #9 In addition, streams are protected by the fish habitat riparian prescriptions listed In Table IV-14[15]. For example, seasonal moderate risk Class IV streams are assigned no-harvest prescription C2-X (SBT Fish IV).	N		
Forestwide Resource Programs: The application of Best Management Practices for the protection of water quality and beneficial uses (fish habitat or potable water, for example) will be monitored on ground-disturbing activities. Specific BMPs will be listed for each activity unit at the time of environmental analysis. On that unit, each Item will be monitored for accomplishment at the close of the activity (for example, release of a subdivision In the timber sale contract).	P, C, R, O	P, B	EIS Sec. 1.5 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.8 EIS Secs. 4.2.2.2 & 4.2.3.2 EIS Secs. 4.2 POD Att. I POD Att. M POD Att. 28

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[10] Table IV-14: Protection Requirements for Stream courses and Riparian Areas, Steamboat Management Area (MA 12) (Assigned Prescription), Umpqua National Forest Land And Resource Management Plan

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
<u>Forestwide Resource Programs:</u> Floodplain and wetland actions require a formal declaration and public notification under Executive Orders 11988 and 11990. The minimum areas considered as floodplains and wetlands are perennial streams and wet meadows, respectively, inventoried in forest ecoclass maps, in the Planning Record. Only lands meeting the definitions of floodplains and wetlands in the executive orders, as determined by environmental analysis, will be subject to evaluation and declaration. The following recurring activities on the Umpqua National Forest have been evaluated and formally declared in Chapter Four of the FEIS for the Forest's Land and Resource Management Plan. a. timber harvest, b. the minimum road construction necessary to cross perennial streams, c. rights-of-way acquisition and conveyance, and d. activities which are permitted or qualify for exemptions from permit under Section 404 of the Clean Water Act (PL 92-500). These activities, when conducted according to applicable prescriptions and standards/ guidelines specified in the Forest Plan, will not significantly affect (or be affected by) floodplains or wetlands. Specific floodplain and wetland declarations will be made for activities not declared In the FEIS for the Forest Plan. Examples are land exchanges, campground construction, building construction In floodplains and wetlands, and road construction affecting wetlands (wet meadows).	P, R	P, B, R, ,	EIS Sec. 1.5 EIS Secs. 4.6.3.4 - 4.6.3.6 EIS Secs. 4.3.2.2 & 4.3.3.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS App. H EIS App. F.4 POD Att. CC POD Att. DD
<u>Forestwide Resource Programs:</u> Activities In wetlands, lakes and perennial streams ('waters of the United States') are subject to provisions of the Federal Clean Water Act, as amended, and Oregon's Removal-FIJI Law (ORS 541.605 - 541.695). Development of wetlands by removing, filling or alteration of more than 50 cubic yards of material must be done under permit from the Oregon Division of State Lands. Where required by section 404 of the Clean Water Act and the Removal-Fill Law, permits will be obtained from the US Army Corps of Engineers and the Oregon Division of State Lands for removal, filling or alteration of lakes, streams and wetlands.	P, C, R	P, B,	EIS Sec. 1.5 EIS Secs. 4.3.2.2 & 4.3.3.2 EIS Secs. 4.3.4.1 & 4.3.4.3 POD Att. CC POD Att. DD
<u>Forestwide Resource Programs:</u> Water uses on National Forest streams will be compatible with the instream needs and reserved rights of the United States. Unreserved nights for compatible uses will be obtained from the Oregon Water Resources Department.	N		
<u>Forestwide Resource Programs:</u> Treatment will be provided for point source discharges of sewage and other waste entering Forest lakes, streams and groundwater. Treatment, testing, and reporting will meet, at a minimum, the applicable standards of the Oregon Department of Environmental Quality and US Environmental Protection Agency.	N		
<u>Forestwide Resource Programs:</u> Public drinking water on the Forest will meet the facility water quality testing and reporting requirements of the Safe Drinking Water Act (PL- 93-523).	N		

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Forestwide Resource Programs: Oil and gas leasing and exploration activities will be conducted in a manner which will meet riparian objectives, maintain fish and Wildlife habitat, and maintain water quality and quantity.	N		
Forestwide Resource Programs: Energy transmission corridors and hydroelectric facilities will be managed In a manner which will meet riparian objectives and maintain fish and wildlife habitat, and water quality and quantity.	N		
Forestwide Resource Programs: Domestic and public water supply intakes will be located on Total Resource Inventory (TRI) Aquatic Sub-system maps. Water quality and flow will be protected when planning activities which will affect domestic and public water supplies.	N		
Forestwide Resource Programs: Comply with State requirements in accordance with the Clean Water Act for protection of waters of the State of Oregon (Oregon Administrative Rules, Chapter 340-41) through planning, application, and monitoring of Best Management Practices (BMPs) in conformance with the Clean Water Act, regulations, and Federal guidance issued thereto.	P, C, R, O	P, B	EIS Sec. 1.5 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.3.2.2 & 4.3.3.2 EIS Secs. 4.3.4.1 & 4.3.4.3 POD Att. I POD Att. M POD Att. CC
Forestwide Resource Programs: In cooperation with the State of Oregon, the Forest will use the following process: a. Select and design BMPs based on site-specific conditions, technical, economic, and Institutional feasibility, and the water quality standards for those waters potentially Impacted. b. Implement and enforce BMPs. c. Monitor to ensure that practices are correctly applied as designed. d. Monitor to determine the effectiveness of practices In meeting design expectations and In attaining water quality standards. e. Evaluate monitoring results and mitigate where necessary to minimize Impacts from activities where BMPs do not perform as expected f. Adjust BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level. Evaluate the appropriateness of water quality criteria for reasonably assuring protection of beneficial uses. Consider recommending adjustment of water quality standards.	P, C, R, O	P, B,	EIS Sec. 1.5 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.7.2 EIS Secs. 4.3.2.2 & 4.3.3.2 EIS Secs. 4.3.4.1 & 4.3.4.3 POD Att. I POD Att. M POD Att. CC POD Att. DD
Forestwide Resource Programs: Use the existing agreed-upon process to Implement the State Water Quality Management Plan on lands administered by the USDA Forest Service as described in memorandum of understanding (MOU) between the Oregon Department of Environmental Quality and U.S. Department of Agriculture, Forest Service (2/12/79 and 12/7/82), and 'Attachments A and B' referred to in this MOU (Implementation Plan for Water Quality Planning on National Forest Lands In the Pacific Northwest 12/78 and Best Management Practices for Range and Grazing Activities on Federal Lands, respectively).	N		

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Watershed Cumulative Effects and Water Quality: In watersheds where project scoping identifies an issue regarding the cumulative effects of activities on water quality or stream channels, a cumulative effects assessment will be made. This will include land in all ownerships in the watershed. Activities on National Forest System lands in these watersheds should be dispersed In time and space at least to the extent necessary to protect beneficial uses of water and aquatic habitat. On intermingled ownerships, scheduling efforts will be coordinated to the extent practicable.	P	P	EIS Sec. 4.7.3.5 EIS Sec. 4.14.2.4 EIS Sec. 4.14.3.4 EIS Sec. 4.14.4 EIS App. F.4
Watershed Cumulative Effects and Water Quality: Before issues are identified regarding cumulative effects of activities on water quality or stream channels, the beneficial uses of downstream waters will be identified. Special attention should be given to identifying those characteristics of the stream which are unique, sensitive and closest to the activity The effects of previous activities on beneficial uses, if not part of the cumulative effects assessment, should be Identified.	P	P	EIS Sec. 4.7.3.5 EIS Sec. 4.3.2.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.5.2.4 EIS Sec. 4.14.2.4 EIS App. F.4
Watershed Cumulative Effects and Water Quality: Beneficial uses of water and aquatic habitats will not be degraded by turbidity, sediment, or scoured stream channels caused by timber harvest, road construction and related activities. To reduce or avoid unacceptable cumulative effects that can result from surface erosion, landslides, and/or debris torrents, timber harvest and associated activities will be evaluated during project planning. This evaluation will be done on watershed analysis areas, which are generally 1000- to 5000-acre watersheds affecting fishery streams.	P, C, R, O	P, B, R,	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.7.3.5 EIS Sec. 4.3.2.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.5.2.4 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS Sec. 4.14.2.4 EIS App. F.4 POD Att. I POD Att. Y POD Att. BB POD Att. DD
Watershed Cumulative Effects and Water Quality: The Umpqua Sediment Index Analysis (USIA) or a comparable procedure will be used when 10 percent or more of soils have a high risk of surface erosion or mass wasting as given In USIA. The potential cumulative effects of these erosional processes will be evaluated and displayed relative to beneficial uses, identified during scoping. The USIA procedure is described In the publication titled 'Umpqua National Forest Plan Standard and Guideline Procedures for Watershed Cumulative Effects and Water Quality' stored In the Umpqua National Forest Planning Record.	N		
Watershed Cumulative Effects and Water Quality: In the Steamboat Management Area, the cumulative effects of landslides, debris torrents and surface erosion will be evaluated and displayed for all watershed analysis areas (generally 1,000- to 5,000-acre watersheds affecting fishery streams). The 'Umpqua Sediment Index Analysis' or a comparable procedure will be used. The USIA procedure is described in the document 'Umpqua National Forest Standard and Guideline Procedures For Watershed Cumulative Effects and Water Quality'. This document is stored In the Umpqua National Forest Planning Record.	N		

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Watershed Cumulative Effects and Water Quality: Beneficial uses of water and aquatic habitats will not be degraded by Increased peak flows and resulting channel scour, caused by timber harvest, road construction and related activities. Project scoping will Identify peak flows as an issue. If more than 25 percent of watershed analysis areas (generally 1,000 to 5,000 acres affecting fishery streams) will have been harvested when activities are completed. Peak flow increases will be estimated only from lands In the transient snow zone, between 2,000 and 5,000 feet elevation.	P, C, R, O	P, B, R,	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.7.3.5 EIS Sec. 4.3.2.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.5.2.4 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS Sec. 4.14.2.4 EIS App. F.4 POD Att. I POD Att. Y POD Att. BB POD Att. DD
Watershed Cumulative Effects and Water Quality: If scoping Identifies peak flows as an Issue, the 'Hydrologic Recovery Percentage' (HRP) or similar procedure will be used to calculate hydrologic condition of project planning drainages. When activities are planned which will reduce hydrologic condition below 75 percent recovery (using HRP or equivalent measure), the potential cumulative effect of increased peak flows will be displayed and evaluated. Evaluation of potential cumulative effects will consider landslide risk, stream channel stability and beneficial uses affected. The HRP procedure is described in the document 'Umpqua National Forest Standard and Guideline Procedures for Watershed Cumulative Effects and Water Quality'. This document is stored in the Umpqua National Forest Planning Record.	N		
Watershed Cumulative Effects and Water Quality: Infiltration of snowmelt and rain should not be decreased on deep pumice soils common to the North Umpqua River aquifer. Subsurface water should not be intercepted on deep pumice soils. On Soil Resource Inventory mapping units 90, 92, 94, 901, 902, 921, 924, 932, 942, 943, and 946 the following standards will be applied to maintain the high summer flow characteristics of streams: a. Permanent roads and landings on inventoried aquifer lands will occupy less than 5 percent of land area or a road density of 5.3 miles/square mile and will not disrupt natural drainage or Intercept and transfer subsurface water to surface channels. b. Drainage structures (relief culverts or drain dips) on new or reconstructed roads will be placed no more than 100 feet from perennial or intermittent streams. c. Soil productivity standards With respect to detrimental compaction will be applied.	N		
Layng Creek Municipal Watershed: Use of all chemicals within the Layng Creek Municipal Watershed will be coordinated with and acceptable to the City of Cottage Grove.	N		
Layng Creek Municipal Watershed: Maintain water quality on all lands, according special attention to lands prone to erosion and mass failure In the Layng Creek Municipal Watershed. A normal watershed restoration program will be implemented. Watershed enhancement activities are encouraged.	N		

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Layng Creek Municipal Watershed: Woody residues in fishery streams will be managed in favor of reducing turbidity risks.	N		
Soil Productivity			
The combined total amount of unacceptable soil condition (detrimental compaction, displacement, puddling or severely burned) within an activity area (e g., cutting Unit, range allotment, site preparation area) should not exceed 20 percent. All roads and landings, unless rehabilitated to natural conditions, are considered to be In detrimental condition and are included as part of this 20 percent. Criteria for unacceptable soli conditions are: a. Detrimental compaction: A physical change to soil resulting from mechanical forces such as weight and vibration that Increase soli bulk density and decreases soil porosity. 1. Volcanic ash/pumice soils· An Increase In soil bulk density of 20 percent or more over the undisturbed level. 2. Other soils· An Increase in soil bulk density of 15 percent or more over the undisturbed level, or a macropore space reduction of 50 percent or more. b. Detrimental puddling: The physical change to soil structure that results when traffic ruts and molds a soil to a depth of 6 Inches or more. c. Detrimental displacement: The horizontal removal by mechanical means of 50 percent or more of the A 1 or AC horizons from 100 square feet and where one dimension is at least 5 feet (an area at least 5 by 20 feet). d. Severely burned: A surface soil condition where the top layer has significantly changed color (usually more red) and the next half-inch contains blackened or charred organic matter because of soil heating.	P, C, R, O	P, B, A	EIS Sec. 1.5 EIS Sec. 2.1.3.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.7.3.4 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Sec. 4.14.2.3 EIS Secs. 4.14.3.1 & 4.14.3.4 POD Att. I LRMP Amendment UNF-3
To meet acceptable levels of surface soil loss resulting from gravity, water, or wind action on land dedicated to the production of vegetation, provide for at least a minimum amount of effective ground cover to exist within the first year following the end of a ground-disturbing activity, as specified in Table IV-15[11].	P, R	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 POD Att. I
Surface organic material (litter, duff and wood) needed to maintain soil productivity will be planned for all ground-disturbing activities, including post-wildfire activity. Minimum litter and duff needed for mineral soils with cold climatic conditions, low nutrient levels, and/or low water holding capacities will be similar to the amount of effective ground cover needed for soils with high to very high erosion hazard ratings. (See Table IV-15[17].)	P, R	P, B,	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Sec. 4.4.2.3 EIS App. F.4 POD Att. I POD Att. U POD Att. DD

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[11] Table IV-15: Minimum Ground Cover Requirements, Umpqua National Forest Land And Resource Management Plan

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Large woody material (LWM) needed to maintain long-term soil productivity shall be left on site following regeneration harvest, catastrophic salvage, and site preparation in all forest ecoclasses. This material provides sites for a wide variety of flora and fauna that are part of the essential network of nutrient recyclers and nitrogen accumulators. The amount, condition, and distribution of LWM needed are not clearly established with current research. The recommendations in Table IV-16[12] reflect the current best estimate based on linked data and experience. Up to 60 percent of the total required woody material may be left as 'standing wood' (green culls and/or snags) at regeneration harvest. In shelterwood units, up to 100 percent of total required woody material may be left as 'standing wood' at initial harvest entry.	N		
Soil mass movement potentials shall be evaluated on all project areas. A risk and hazard analysis shall be made by an interdisciplinary team process when there is a chance of triggering mass movement events which either: a. Have the potential risk of one or more 300-square-yard and larger mass movement event for a period of 15 years following an activity, Or b. Have the potential hazard to damage life, property, facilities, soil, water, and/or fishery values. Decisions regarding the nature of the proposed activities should consider the results of this risk-and-hazard analysis and ensure that minimum soil, water, and fish habitat standards and guidelines are met. When management activities would significantly increase the potential risk or hazards in items (a) and (b), alternative prescription(s) will be developed and evaluated.	P	P, B, R	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 3.4.3 EIS Sec. 4.1.2.2 POD Att. I
Areas Identified as high risk for mass movement will be delineated and permanently stored on District Inventory maps.	N		
Timber harvest and road building activities planned on Soil Resource Inventory (SRI) Mapping Units 21, 211, 212, 213, 215, 242, 342, 412, 71, and 712 are to have no timber cutting (Including salvage) and no road or trail construction within a slope stability buffer zone along all streams where sideslope gradients exceed 50 percent. This no-cut stability buffer will start from the streambank or from the upslope terrace edge, when present It will extend upslope for a distance that is three times the average slope gradients exceeding 50 percent (slope distance measured in feet). The no-cut buffer requirement can be waived or modified following documented, Site-specific soil, geologic, and watershed Investigations when little risk to soil, stream habitat or other related values exist.	N		
All lands classified as unsuitable due to Irreversible soil damage, Including all steep (greater than 60 percent gradient), granitic soils found In SRI Mapping Units 61, 612, 617, 621, 623, 624, 631, and 673, will not have tree cutting or any other ground-disturbing activities that likely will Increase the risk of mass movements.	N		

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[12] Table IV-16: Specifications For Large Woody Material, Umpqua National Forest Land And Resource Management Plan

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
SRI mapping Units with landtypes 8, 31, 41, 46, 51, 91, and 96 on slopes exceeding 60 percent have scattered sites with high mass movement potentials. When these landtypes are encountered during project planning, site-specific soil, geologic and watershed evaluations for movement risk and hazards shall be made. Pages 71-78 of the SRI report display the landtype component by percent area for each SRI mapping Unit.	N		
Project analysis will address how the proposed activities plan to meet soil standards and guidelines. Mitigation measures (or additional alternatives) will be developed and evaluated when detrimental soil conditions are expected as a result of the proposed action	P, R	P, B, ,	EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.7.3.4 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS App. F POD Att. I POD Att. DD
During and after ground-disturbing activities, soil conditions will be monitored to determine if sod management objectives are being met.	C, R, O	B	EIS Sec. 2.4.2.1 EIS Secs. 2.7.1 & 2.7.2 EIS Sec. 4.7.3.5 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS App. F.4 POD Att. I
Plan and conduct restoration projects on lands where range, road construction, timber harvest, or other management activities cause soil and watershed conditions that do not meet standards and guidelines. Evaluate for use of KV funds.	P, R	P,	EIS Sec. 2.1.4 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS App. F EIS App. F.4 POD Att. DD
Designed erosion control measures should have effective ground cover and erosion control structures applied on construction sites, Including new road construction and reconstruction, by the beginning of the rainy season. Erosion control measures and drainage structures will be maintained current with operations. Any soil disturbed during the rainy season In excess of 0.5 acre will have effective ground cover provided Forestwide, the rainy season is considered to be November 1 through April 30. Effective ground cover is considered to be the amount of cover necessary for maintaining a disturbed Site In a low hazard category for erosional processes See Table IV-12[13] for minimum requirements for effective ground cover material. Alternate erosion control measures may be substituted for effective ground cover if considered equal by the Forest Service	P, C, R, O	P, B	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y POD Att. BB
Site-specific analysis will be performed and documented for activities which affect evapotranspiration within the runoff source area (watershed) of active slump/earthflow areas. The analysis will, at a minimum, recommend ways to schedule or mitigate effects of the proposed activity on earthflow movement.	N		

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[13] Table IV-12: Forest Growth and Mortality (From Suitable Lands), Umpqua National Forest Land And Resource Management Plan

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Soil chemical and physical characteristics should be evaluated to aid in the prioritization of fertilization projects.	N		
Erosion control needs will be identified where developed areas, including recreation sites, roads, trails, rockpits and others, produce erosion/sedimentation that may affect water quality and beneficial uses In surface waters (lakes, streams, springs, ponds).	P, C, R, O	P, B,	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y POD Att. BB POD Att. DD
Layng Creek Municipal Watershed: Identify and carefully manage lands associated with high Soil erosion and/or high landslide risk to maintain water quality. Watershed restoration activities on such lands should be encouraged.	N		
Experimental Forest			
Not Applicable, Excluded From Table			
Research Natural Areas			
Not Applicable, Excluded From Table			
Minerals/Geology			
Not Applicable, Excluded From Table			
Lands			
Land Uses: Land use evaluation, permit issuance, fees, and administration will be in accordance With 36 CFR 251 and current management direction.	P	P, B, R,	EIS Sec. 1.5.2 EIS Secs. 1.4.1 & 1.4.2 EIS Secs. 2.1.4 - 2.1.6 EIS Sec. 4.7.3.4 – 4.7.3.6
Land Uses: In considering land use applications, the benefits to the public as a whole will be given higher priority. All applications will be processed in a timely manner.	P	P	EIS Sec. 1.4.2 EIS Secs. 1.4.1 & 1.4.2 EIS Secs 2.1.6
Land Uses: Priority will be given to cost-sharing and easement exchanges in the administration of the land use program.	N		
Land Uses: Land use terms, conditions or stipulations will be adequate to protect land and other resource values. Forest Service approval is required for the location of all developments, designs, and plans for the construction of facilities.	P	P, B, R	EIS Sec. 1.5.2 EIS Secs. 1.4.1 & 1.4.2 EIS Secs. 2.1.6 EIS Sec. 4.7.3.4
Land Uses: Land to be used will be suitable for the proposed use and limited in size consistent with the intended use. National Forest land will not be made available for private development when suitable private land is available to support needs.	P	P, R,	EIS Sec. 1.4.2 EIS Secs. 1.4.1 & 1.4.2 EIS Secs. 2.1.4 - 2.1.6 EIS Sec. 4.7.3.4 – 4.7.3.6

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Land Uses: New permits will be Issued through a competitive process If there is a competitive Interest If additional recreation services or facilities are determined to be needed and could be provided by the private sector, the Forest will explore the opportunity to do this by expanding existing permits or issuing permits for a new service or facility.	N		
Landownership: Consistent with Forest Plan direction, landownership adjustments will be made based upon a determination of the ownership pattern within the Forest boundary which will best resolve conflicting uses with adjacent landowners and Improve resource management efficiency.	N		
Landownership: The Small Tracts Act (P.L 97-465/96 Stat. 2535 1/12/83) will be utilized as needed to resolve cases which are within the authority of the Act.	N		
Land Lines: Maintenance of existing posted landlines will be the top priority in annual program formulation.	N		
Land Lines: Unposted property lines between National Forest System lands and those managed by the Bureau of Land Management will be marked and agreed upon between appropriate line managers as impacting projects are planned.	N		
Facilities: Transportation System			
Transportation System Construction and Reconstruction: Road density should be the most economical system necessary to meet land management objectives. Evaluation of road development alternatives will be made for the planned uses considering safety, costs of transportation, and effects upon lands and resources	N		
Transportation System Construction and Reconstruction: Road design standards will be based on the following criteria: Resource management objectives, environmental constraints, safety, physical environmental factors, traffic requirements, traffic service levels, vehicle characteristics, road users, and economics. Road design criteria will be documented for all roads on or added to the Forest Transportation System. Arterial and collector roads will be designed for traffic service levels A, B, or C. Local roads will be designed for traffic service levels C or D Design standards will follow the guidelines in the Road Preconstruction Handbook.	P	P, B, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.7.2 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. Y
Transportation System Construction and Reconstruction: Stream crossings adequate for fish passage will be incorporated into the design and construction of all new roads crossing streams which support fisheries. An analysis will be made of fishery values versus various alternatives for these types of structures. Inadequate structures on existing roads will be programmed for replacement providing there has been an analysis of the fishery values and the additional costs.	P, C, R, O	P, B,	EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Sec. 4.7.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.4 POD Att. Y POD Att. BB POD Att. DD

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Transportation System Construction and Reconstruction: Planned road construction activities, in areas with known or potential slope stability, erosion and drainage concerns, should be implemented only after soil, water, geotechnical engineering and geological evaluations have been made.	P, C	P, B, R	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.1.2.2 & 4.1.3.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y
Transportation System Construction and Reconstruction: Designed erosion control measures should have effective ground cover and erosion control structures applied on construction sites, including new road construction and reconstruction, by the beginning of the rainy season. Erosion control measures and drainage structures will be maintained current with operations. Any soil disturbed during the rainy season m excess of 0.5 acre will have effective ground cover provided. Forestwide, the rainy season is considered to be November 1 through April 30. Effective ground cover is considered to be the amount of cover necessary for maintaining a disturbed site In a low hazard category for erosional processes See Table IV-15[14] In the 5011 Productivity standards and guidelines section for a definition of effective ground cover material. Alternate erosion control measures may be substituted for effective ground cover if considered equal by the Forest Service.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y
Transportation System Construction and Reconstruction: Prior to Implementing major reconstruction work (continuous segments of realignment, significant betterment, or change in surfacing type), alternatives will be analyzed for resolving road capacity, safety, road surface structural, or life-cycle cost concerns. Alternatives considered should be traffic management, spot reconstruction, or complete reconstruction.	N		
Transportation System Construction and Reconstruction: During project transportation planning, aerial or long-span yarding systems should be considered where feasible, as alternatives to construction of new roads on steep or highly erosive slopes, where there is a potential of affecting water quality and the beneficial uses of water. These should be considered where roads are being planned on side slopes over 50 percent, or where high mass wasting potential or highly erosive soils have been Identified. These systems should also be considered where they can contribute to other resource objectives such as visual, wildlife, and recreation.	P	P, B, R	EIS Sec. 4.7.3.5 EIS Secs. 4.1.2.2 & 4.1.3.1 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.4 POD Att. 1 POD Att. Y
Transportation System Construction and Reconstruction: Proposed airfields and heliports must first be evaluated through the environmental assessment process and conform to all Federal Aviation Administration (FAA) guidelines and standards applicable at the time of construction.	N		

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[14] Table IV-15: Minimum Ground Cover Requirements, Umpqua National Forest Land And Resource Management Plan

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Transportation System Management and Maintenance: All Forest development roads will be maintained to protect the resources, perpetuate the intended road management objective, and protect the investment in the facility. These roads will be maintained In accordance with maintenance standards in FSH 7709.15, Transportation System Maintenance Handbook. Road maintenance planning and priorities should emphasize the maintenance of: a. Drainage and erosion control structures and features, including bridges, on all Forest development roads b. Signs and traffic control devices. c. Arterial and collector roads. d. Trailhead and recreation site access roads, and campground roads.	P, C, R, O	P, B,	EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y POD Att. DD
Transportation System Management and Maintenance: Management of roads will be in accordance with the Highway Safety Act on roads intended to be used by the public for travel with normal passenger cars (normally roads in Maintenance Levels 3 through 5).	N		
Transportation System Management and Maintenance: Road ditches that show no sign of erosion (e.g., grassed-in, rocky, etc.) should not be disturbed by road maintenance unless necessary to maintain drainage.	C, O	B	EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y
Transportation System Management and Maintenance: Forest development roads will be managed with a mix of traffic management strategies to accomplish road management objectives and to reduce road user conflicts.	N		
Transportation System Management and Maintenance: Roads may be made available for different user groups at different times, or otherwise restricted. All Forest development roads are subject to short-term traffic restrictions and/or closures, due to seasonal or unusual weather conditions, safety hazards, emergency traffic, or when necessary to permit reconstruction and maintenance	P,C,R,O	P,B,	EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y POD Att. DD
Transportation System Management and Maintenance: Roads will not be used if their use causes irreparable damage to the road or unacceptable impacts to adjacent resources (36 CFR 261). Damage is exclusive of normal wear, involves a reduction In the ability of a road or roadway structure to carry traffic, and cannot be corrected by normal maintenance practices.	P, C, O	P, B	EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y
Transportation System Management and Maintenance: Vehicle load, weight, height, length, and width limitations may be Imposed (36 CFR 212.7). Variance from these limitations will require a permit or other written authorization.	P, C, O	P, B.	EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y POD Att. DD

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Transportation System Management and Maintenance: All State of Oregon traffic rules and regulations apply on all open Forest development roads (roads in Maintenance Levels 2 through 5), except where Federal orders under 36 CFR 261 have been Issued (36 CFR 212).	P, C, R, O	P, B,	EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y POD Att. DD
Transportation System Management and Maintenance: Road entrance management information that visually communicates to Forest visitors the road conditions and purpose of the road, such as mixed traffic, passenger car use, high clearance vehicles only, or logging use only, will be provided for each Forest development road. Emphasis will be on providing this Information at the entrance of roads not maintained for passenger cars.	N		
Transportation System Management and Maintenance: Assure short-term (temporary) roads are closed within one year of when the timber purchaser has completed contractual requirements for the portion of the timber sale served by the road. Re-establish vegetation cover to put land back into production within ten years of contract, lease, or permit termination on roads not remaining a permanent part of the Forest transportation system.	N		
Transportation System Management and Maintenance: Forest development roads will generally be open to use by vehicles licensed for highway travel, except when closed for one of the following reasons: a. The mode of access causes unacceptable damage to, or negates adequate protection and management of Forest resources. b. Safety hazards to the road user exist. c. Prescriptions in this Forest Plan recommend closures. d. To provide security to contractors/cooperators, special use permittees, private land owners, and Forest Service administrative facilities. e. Road maintenance costs to keep a road open are high compared to existing or expected use of the road. Roads closed for one of the above reasons may be closed either seasonally or year-around. Seasonal closures are preferred over year-around closures, wherever feasible, consistent with Forest Plan prescriptions, and If the objectives of the closure can be met. The Forest Supervisor, under the authority of 36 CFR 261, may enter into cooperative road closures during hunting season with the Oregon Department of Fish and Wildlife for protection of Forest resources.	P,C, R, O	P, B,	EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y POD Att. DD
Transportation System Management and Maintenance: Some open roads will only be maintained for high clearance vehicle use (Maintenance Level 2). Roads with seasonal road closures will be maintained In accordance with Maintenance Level 2 through 5 standards. Roads closed for one year or more (year-around closure) will be generally maintained to Maintenance Level 1 standards, except for those closed to provide security to administrative facilities, which may be maintained to a higher level.	N		

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Transportation System Management and Maintenance: During development and subsequent review of District Travel Management Plans (Appendix F[15]), existing road closures will be evaluated as to the specific objectives to be accomplished by the closure, the type of closure device used, and the need to continue the closure Prior to blocking or closing an existing Forest development road the following will be documented: a. Reason or objective for the closure. b. The closure period (seasonal or year-around). c. Exceptions to the closure; I.e. who or what type of vehicle may use the road, and under what circumstances d. The type of closure device (physical barriers, signing, natural barrier, or locked gate). Law enforcement needs and prescriptions will be identified prior to Issuing regulatory closures.	N		
Transportation System Management and Maintenance: Advisory devices and natural barriers (earth berms, rocks, brush, etc.) are preferred over regulatory road closures and locked gates where It is necessary to close roads. Use an advisory sign (or poster) near locked gates to describe the reason for the closure. Notify the public before closing an existing open road with a locked gate (except for emergencies). Give sufficient lead time in the notice. Use advisory signs in advance of road closures where adequate turnaround for public traffic is not available at the closure or where significant inconvenience to the public may occur.	P, C, R, O	P, B, R,	EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y POD Att. DD
Transportation System Management and Maintenance: Various road management techniques and strategies may be used to accomplish land and resource management goals and prescriptions in this plan. Following their development, the travel management plans will be reviewed annually and updated every two years, if necessary. Guidelines for travel management planning is in Appendix F[21].	N		
Transportation System Management and Maintenance: Some closed roads (Maintenance Level 1) may be converted to other uses such as all-terrain vehicle (ATV) routes, and special purposes trails. Some roads In Maintenance Levels 2 through 5 may be closed to highway legal vehicle use during the winter, when sufficient snow depth exists, for use as winter sports trails (Nordic skiing, snowmobiles, etc.). See Forestwide standards and guidelines for dispersed recreation, and Appendix F[21], for additional guidelines for use of closed roads.	C, R, O	P, B, R,	EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y POD Att. DD
Transportation System Management and Maintenance: Existing airfields or heliports are to be operated and maintained using existing direction documented In appropriate Forest Service manuals and handbooks.	N		
Transportation System Management and Maintenance: Input and comment will be requested from facility users, the FAA and the Oregon Aeronautics Division of the Department of Transportation on any proposed closure of an airfield or heliport. Closure of any aviation facility will be In conformance with Forest Service and FFA standards.	N		

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[15] Appendix F: Recreation Travelway Management Guide, Umpqua National Forest Land And Resource Management Plan

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Facilities - Corridors			
Utility Corridors: The four existing utility Corridors are shown on the utility Corridor map (see Figure IV-3[16]). The Forest Service will coordinate with the Federal Energy Regulatory Commission (FERC) and Pacific Power and Light in the maintenance of the Corridors authorized under FERC license. The corridors authorized by Forest Service special use permits will be maintained as stated in the authorizing document.	N		
Utility Corridors: The western regional Corridor study of 1986 by the Western Utility Group Identified two additional Corridors on the Umpqua National Forest. A maximum of three additional potential utility corridors, known as 'windows', will be considered for future utilities. These windows are shown on the Utility Corridor Map[20] and as described below. Any future proposal to construct a utility line within these 'windows' will require a separate environmental analysis or EIS: a. Windigo Pass Utility Window: The possibility for a utility Corridor exists through Windigo Pass outside of the OCRA. This 1,000- foot window, 500 feet on each side of Forest Road No 60, follows the boundary of the two parts of the OCRA As the boundary of the OCRA follows the curvature of Forest Road No. 60, the construction of a power transmission line totally within the boundary of this Window may not be practical. However, Section 4(e) of The Oregon Wilderness Act of 1984, which established the OCRA, states, “Within the recreation area, the Secretary may permit, under appropriate regulations, those limited activities and facilities which he determines necessary for resource protection and management and for visitor safety and comfort, including .. (6) public services land occupancies, Including power transmission lines, provided there is no feasible alternative location, and, the Secretary finds that it is In the public interest to locate such facilities Within the recreation area.” b. Upper Highway 138 Window: This Window, near State Highway 138, will need future study and analysis, as only a narrow strip between the boundaries of Crater Lake National Park and Mt Thieisen Wilderness/ OCRA is available. c. Red Butte Window: This proposal connects a power transmission line from Red Butte to the Soda Springs-Roseburg line. The maximum Width of this corridor will be 600 feet.	N		
Utility Corridors: Any new proposed utility corridors will be planned on an Interagency basis and coordinated between the affected National Forests. The three canal corridors on the North Umpqua River, Clearwater River and Fish Creek, which supply water to Pacific Power and Light's Toketee power installation will be operated according to the license granted by the Federal Energy Regulatory Commission (#1927).	P	P, R	EIS Sec. 1.5.2 EIS Sec. 1.4.2.1 EIS Sec. 2.1.6 EIS Sec. 2.3.2.3 EIS Secs. 3.4.3

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[16] Figure IV-3: Utility Corridors (Power), Umpqua National Forest Land And Resource Management Plan

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Transportation Corridors: The three existing transportation corridors are shown on the transportation map (see Figure-IV-4[17]). These corridors are Oregon State Highway 138, (North Umpqua Highway segment); State Highway 230 (Diamond Lake West Highway); and Douglas County Road 1 (part of the Tiller Trail Highway).	N		
Transportation Corridors: Procedures for the coordination of maintenance, signing, right-of-way grants, access control, any reconstruction and other matters relating to the portions of Oregon State Highways 138 and 230 Within the Forest will be in accordance with the current Memorandum of Understanding between Region SIX, USDA Forest Service, and Oregon Department of Transportation, Highway Division.	N		
Transportation Corridors: Procedures for the coordination of planning, design, and construction of Forest highway projects within, adjacent to, or serving the Forest will be In accordance With the Memorandum of Understanding between the Federal Highway Administration and the U.S. Forest Service (FSM 1535).	N		
Transportation Corridors – Windigo Pass Transportation Window: The possibility of a transportation corridor exists along Forest Development Road (FDR) 60 between Highways 138 and 58, including the window outside of the OCRA through Windigo Pass. This potential transportation Corridor, or window, is shown on the transportation map. The Windigo Pass Road (FDR 60), from Its junction With FDR 6020 on the Deschutes National Forest south to its Junction with FDR 6000-700 at the south end of the OCRA on the Umpqua National Forest, will be managed as follows:	N		
Transportation Corridors – Windigo Pass Transportation Window: There is no immediate need to improve this road. The road is adequate to handle the existing low volume of traffic use. The Windigo Pass Road will be managed at its current design and maintenance standards for the foreseeable future.	N		
Transportation Corridors – Windigo Pass Transportation Window: The road may be Improved in the future as needed to accommodate Increased traffic demands Any future upgrading of the road or Improvement In road standards will be undertaken only after further NEPA documentation and public Involvement Involving both the Umpqua and the Deschutes National Forests.	N		
Transportation Corridors – Windigo Pass Transportation Window: The road will be maintained during the winter as a snowmobile route, and left unplowed for standard highway type vehicles.	N		
Transportation Corridors – Windigo Pass Transportation Window: The Windigo Pass Road (FDR 60), from Its Junction With Highway 138 to Its junction With FDR 6000-700 at the south end of the OCRA on the Umpqua National Forest, may be upgraded, including paving, to meet traffic needs.	N		

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[17] Figure IV-4: Umpqua National Forest Transportations System, Umpqua National Forest Land And Resource Management Plan

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Transportation Corridors: Any major upgrading of existing transportation corridors will be coordinated between the National Forest and the agency proposing the project, With the appropriate environmental reviews as required by NEPA.	N		
Transportation Corridors: Visual resource management direction for the existing transportation corridors and the potential Corridor through Windigo Pass is contained in the Forest-Wide Standards and Guidelines for Visual Resource.	N		
Facilities - Administrative Sites – Not Applicable, Excluded			
Protection			
Fire Management: Wildfires that threaten life, property, public safety, Improvements, or investments will receive aggressive suppression action using an appropriate suppression response.	N		
Fire Management: All wildfires will require the use of the appropriate suppression response. This will provide the option of applying the appropriate strategy to all areas of the Forest, using cost efficiency and meeting resource management objectives.	N		
Fire Management: Wildfires that escape initial action and threaten to exceed established limits will require that an Escaped Fire Situation Analysis (EFSA) be prepared. This analysis will measure the cost of suppression against the resource loss potential, with emphasis on minimizing the cost and resource losses	N		
Fire Management: Levels and methods of fuels treatment will be guided by the protection and resource objectives within the management area. The Forest fuels appraisal process will be available for use to assist in making this determination. Reducing fuel loadings through marketing strategies will be explored.	N		
Fire Management: Prescribed fire is a management tool that may be used to meet management and vegetation objectives, and to maintain desired fuel profiles In all ecosystems. It will be utilized after an analysis Indicates that it will be cost effective and will meet resource management objectives. The analysis will include air quality considerations such as Increased utilization of slash, reduction of acres to be burned for hazard reduction, and ignition and burning techniques to save as much of the fuels 3' to 8.9' diameter as possible.	P, C, R, O	P, B,	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Sec. 4.5.2.3 EIS Secs. 4.7.3.5 & 4.7.3.6 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 EIS App. F.2 EIS App. F.3 EIS App. F.4 POD Att. I POD Att. R POD Att. DD
Fire Management: Unplanned Ignitions (lightning-caused) may be used for prescribed fires when (1) a prescribed fire plan has been prepared and approved and (2) the fire is burning Within prescribed parameters. (For exceptions to this policy, see Standard #9.)	N		

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Fire Management: Burning plans will be prepared In advance of ignition and approved by the appropriate line officer for each prescribed fire. A prescribed fire exceeding both prescribed parameters and line-holding capabilities will be declared a wildfire and appropriate suppression response will be Initiated.	P, C, R, O	P, B,	EIS Secs. 2.1.4 & 2.1.6 EIS Sec. 2.7.2 EIS Sec. 4.4.2.3 POD Att. R POD Att. DD
Fire Management: Air quality will be emphasized during prescribed fire planning. Mitigating measures will be considered, including extending the burning season to spread emissions throughout the year and the avoidance of burning near recreation areas during peak use periods. All burning will be planned and conducted to comply with applicable air quality laws and regulations and coordinated with appropriate air quality regulatory agencies.	P, C, R, O	P, B,	EIS Sec. 2.1.4 EIS Sec. 2.7.2 EIS Sec. 4.4.2.3 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 POD Att. I POD Att. R POD Att. DD
Fire Management: Planned Ignitions will be considered in wilderness only when an extensive analysis has determined: (1) the area has been Significantly altered from its natural state due to fire exclusion and (2) the probability of lightning Ignition returning the area to its natural state is low. The need for any scheduled Ignition in wildernesses will be addressed In the individual wilderness management plans.	N		
Fire Management: All human-caused unplanned ignitions in wilderness will be declared a wildfire. Natural unplanned Ignitions In wilderness will be permitted to burn if prescribed In an approved management plan.	N		
Fire Management: During timber sale planning, the value of old growth timber stands for wildfire protection should be considered. Efforts to leave these old growth stands adjacent to plantations for wildfire suppression strategies should be considered whenever possible.	N		
Pest Management: Integrated Pest Management (IPM) prevention and suppression strategies will be utilized to manage pests within the constraints of laws and regulations and to meet forest management objectives. Methods may Include management practices (cultural or silvicultural), regulatory measures, biological, mechanical, manual, prescribed fire, and/or chemical treatments.	P, C, R, O	P, B,	EIS Sec. 2.1.4 EIS Sec. 2.8.3 EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Secs. 4.5.1.2 & 4.5.1.3 POD Att. N POD Att. X POD Att. DD
Pest Management: Special procedures will be implemented when pesticides are used, including the certification of contractors and Forest Service crew leaders. All pesticide use will be reviewed and approved before application by administrative representatives who are certified for pesticide use. Public notification will be given in advance of all applications	P, C, R, O	P, B	EIS Secs. 4.4.1.2 & 4.4.1.3 POD Att. N POD Att. X
Law Enforcement: Law enforcement will be a cooperative effort between the Forest Service, other Federal agencies, State, and local law enforcement, within the scope and responsibilities of each agency.	N		

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Law Enforcement: Emphasis will be placed on preventing violations of laws and regulations through the proper administration of Forest Service permits and contracts and an aggressive public information program.	N		
Law Enforcement: Known Violations of laws or regulations will be promptly investigated and appropriate action initiated. Reporting procedures outlined in FSM 5340.3 will be followed.	N		
Human Resources – Not Applicable, Excluded From Table			
Management Area 1: Provides opportunities for unroaded recreation primarily In semi-primitive settings.			
Not Applicable, Excluded From Table			
Management Area 2: Provides an appropriate environment for concentrated developed recreation activities in the areas immediately surrounding Diamond and Lemolo Lakes.			
Not Applicable, Excluded From Table			
Management Area 3: Provides an appropriate area for future development of a winter sports site on Mount Bailey, Insures that prescriptions assigned will provide for management of the area in condition suitable for ski area development. Insures that prescriptions assigned will provide for management of the area in a condition suitable for ski area development. e			
Not Applicable, Excluded From Table			
Management Area 4: Manage to preserve the natural character of these lands In a manner consistent with the Wilderness Act of 1964 and the Oregon Wilderness Act of 1984.			
Not Applicable, Excluded From Table			
Management Area 5: Manage the Oregon Cascades Recreation Area (OCRA) consistent With the intent of the Oregon Wilderness Act.			
Not Applicable, Excluded From Table			
Management Area 6: Provides for the protection and enjoyment of remarkable designated special Interest areas.			
Not Applicable, Excluded From Table			
Management Area 7: Manage the North Umpqua River, as designated In the Oregon Omnibus Wild and Scenic Rivers Act of 1988, for the protection of remarkably outstanding features for the benefit and enjoyment of people.			
Not Applicable, Excluded From Table			
Management Area 8: Manage as an experimental forest dedicated to basic and applied research on the function and operation of forest ecosystems In both natural and disturbed states.			
Not Applicable, Excluded From Table			
Management Area 9: Manage established and Identified potential research natural areas (RNOs) in the system of nationwide RNOs.			
Not Applicable, Excluded From Table			

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Management Area 10: Produce timber on a cost-efficient sustainable basis consistent with other resource objectives for wildlife habitat, riparian habitat and water quality, visual quality, and recreation.			
Not Applicable, Excluded From Table			
Management Area 11: Provide big game winter range habitat and timber production consistent with other resource objectives for wildlife habitat, riparian habitat and water quality, visual quality, and recreation.			
Not Applicable, Excluded From Table			
Management Area 12: Provides additional management direction to maintain or enhance the fisheries resource of Steamboat Creek and Its tributaries consistent with the intent of the 1984 amendment to the Wild And Scenic Rivers Act.			
Not Applicable, Excluded From Table			
Management Area 13: Provides additional emphasis for the orderly exploration, development, extraction, and production of mineral resources on lands within the Fairview-Bohemia mineralized area.			
Not Applicable, Excluded From Table			
Management Area 14: Manage undeveloped Intact ecosystems for their ecological values with a focus on preservation of the genetic base of natural plants and animals and maintenance of natural processes.			
Not Applicable, Excluded From Table			
Prescription A1-I: Recreation, Semi-Primitive Non-Motorized - No Harvest			
Not Applicable, Excluded From Table			
Prescription A1-IV: Recreation, Semi-Primitive Motorized - No Harvest			
Not Applicable, Excluded From Table			
Prescription A1-V: Recreation - Unroaded Concentrated			
Not Applicable, Excluded From Table			
Prescription A3-I: North Umpqua Viewshed			
Not Applicable, Excluded From Table			
Prescription A4-I: Recreation - Concentrated Developed			
Not Applicable, Excluded From Table			
Prescription A4-II: Recreation – Winter Sports Site			
Not Applicable, Excluded From Table			
Prescription A4-IV: Recreation – Existing Developed Sites at Less Than Standard-Service Level			
Not Applicable, Excluded From Table			
Prescription A4-V: Recreation Maintenance Levels Than Standard-Service Level			
Not Applicable, Excluded From Table			

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Prescription A4-V: Recreation Maintenance Level			
Not Applicable, Excluded From Table			
Prescription A5-II: Recreation, Special Interest Areas			
Not Applicable, Excluded From Table			
Prescription B1-II: Wilderness WRS Primitive			
Not Applicable, Excluded From Table			
Prescription B1-III: Wilderness WRS Semi-Primitive			
Not Applicable, Excluded From Table			
Prescription C1-I: Old Growth Groves (Recreation Use)			
Not Applicable, Excluded From Table			
Prescription C1-II: Spotted Owl (Dedicated)			
Not Applicable, Excluded From Table			
Prescription C2-I: Riparian Area Class I and II Streams, Lakes and Ponds			
Recreation: Recreation facilities and trail locations are designed to protect vegetation which is providing shade, stabilizing banks and sides lopes, or serving as existing or future fish habitat source (woody material for Class I and II streams) Sanitary facilities are discouraged in riparian areas and must adequately treat wastes consistent With DEQ regulations. Existing recreation developments are maintaining existing water quality, fish, and Wildlife habitat. Before Investment In new campgrounds or other facilities are undertaken, a floodplains and wetland determination and assessment of Impacts, With public notice, are necessary on these streams and wetlands.	N		
Recreation: ORV use is not permitted except on designated, hardened trail prisms.	N		
Visual: Visual management activities will be consistent With riparian objectives.	N		
Wilderness: All Wilderness activities are compatible In riparian areas, Including natural fire, trail construction and use, and research	N		
Wildlife and Fish: All fish habitat improvement projects, structural wildlife improvements and snag preservation are compatible In riparian areas and are encouraged. Provide structural and nonstructural improvement projects to maintain or Increase the present population of salmonids. These areas are suitable for winter range cover for big game, except the Layng Creek watershed.	P, R	P,	EIS Sec. 2.1.4 EIS Secs. 4.4.1.3 & 4.4.2.3 EIS Secs. 4.5.1.3 & 4.5.2.4 EIS Sec. 4.7.3.5 EIS App. F.4 POD Att. P POD Att. U POD Att. DD

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Range: Livestock use is permitted when consistent With allotment management plans, If riparian objectives are met. Locate watering structures and sailing, holding and loading areas outside riparian areas Direct trailing across, but not along, watercourses Within the riparian area.	N		
Timber: No timber harvest, site preparation, release, planting, precommercial thinning, firewood cutting or pesticide use are permitted except to meet riparian objectives. Salvage harvest is restricted to catastrophic occurrences (>50 percent of existing stand), when timber not necessary for fish habitat, water quality, wildlife habitat or soil productivity may be removed In consultation with a fishery biologist or hydrologist. Yarding corridors are permitted at designated locations with full log suspension over the streambank and protected vegetation corridors must minimize disturbance to riparian vegetation and meet riparian objectives. If effective shade or fish habitat is reduced, shade or habitat restoration is necessary for mitigation. Maintain existing deciduous/ conifer mix of riparian vegetation Maintain existing channel profile through vegetation rootmat In banks, and with stable woody material In the channel.	N		
Soil and Water: Watershed improvement projects are compatible and desirable to meet riparian objectives. Soil restoration projects will take place as necessary to maintain or reduce sediment delivery to permanent streams. Plant vegetation where necessary to minimize soil movement. Where existing shade or channel stability has been reduced, plant hardwoods along stream courses to provide shade where sufficient moisture occurs. Plant rapid-growing conifers on drier upper banks to provide long-term shade. Emphasize watershed Improvement In riparian areas where appropriate.	P, R	P, ,	EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.5.1.3 & 4.5.2.4 EIS Secs. 4.7.3.4 - 4.7.36 EIS App. F.4EIS App. F.4 POD Att. I POD Att. BB POD Att. DD
Minerals: Rehabilitation of existing rock quarries or pits by seeding and planning is compatible and desirable. Extraction or storage of common minerals, Including use and construction of rock pits, is discouraged In riparian areas when riparian objectives cannot be met. Panning or dredging in or adjacent to streams is compatible when carried out in accordance with Oregon Department of Fish and Wildlife recommendations, Oregon Department of Environmental Quality recommendations and riparian objectives. Special stipulations will be required for mineral leases when needed to protect riparian habitat. Operating plans for mining operations will Include reasonable, operationally feasible requirements to protect riparian values and to meet State water quality standards.	N		
Lands: On lands considered for exchange, a floodplain and wetland determination and assessment of Impacts, with public notice, are necessary on these streams and wetlands. Encourage the acquisition of riparian lands that may be of Significant Wildlife or fisheries value Special use applications must show compatibility with riparian objectives before awarded.	N		

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Facilities: Allow for free fish passage on all Class I and II streams and lakes. Roads crossing riparian areas are compatible with the prescription when mitigation measures are employed to prevent sediment delivery to streams and lakes, to replace effective shade, and to protect water crossings from flood peaks and resulting channel impacts. Utility/transportation corridors, roads or transmission lines may cross but must not parallel streams and lake shores within the riparian unit. Pesticides may not be used In the riparian unit. Buildings and other structures should conform to management direction In timber and recreation program elements for vegetation disturbance and sanitation, respectively. Open canals and site occupancy related to hydropower projects are not compatible. Before investment In new buildings or other facilities are undertaken, a floodplain and wetland determination and assessment of Impacts, with public notice, are necessary on these streams and wetlands.	N		
Protection: Activities which minimize both prescribed fire and wildfire damage to riparian vegetation are necessary. Rehabilitation of disturbance from suppression activities must be planned, Including erosion control, channel storage structures, and streambank stabilization. Utilize the appropriate suppression responses that will minimize damage to riparian vegetation. Measures must be taken to prevent burning riparian vegetation during slash disposal adjacent to streams These measures Include hand piling slash, not burning, burning one side of a Unit at a time, low-intensity burning, or hose-lays to protect riparian vegetation. Firelines should be constructed outside the riparian unit.	P, C, R, O	P, B, ,	EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.4 POD Att. I POD Att. DD
Protection: Insect and disease control practices are allowed when riparian objectives can be met.	N		
Protection: No pesticide use is permitted In riparian units during the season when flow occurs (seasonally In ephemeral streams and year-round In perennial streams). Fire retardant may not be applied to fish-producing (Class I and II) streams or lakes.	N		
Prescription C2-II: Riparian Area Class III Streams, Lakes and Ponds			
Recreation: Recreation facilities and trail locations are designed to protect vegetation which is providing shade, stabilizing banks and sideslopes, or serving as aquatic food source. Sanitary faculties are discouraged and must adequately treat wastes consistent With State DEQ regulations Existing recreation developments are maintaining existing water quality, fish and Wildlife habitat Before investment In new campgrounds and other facilities, a floodplain and wetland determination and assessment of Impacts, with public notice, are necessary on these streams and wetlands	N		
Recreation: ORV use is not permitted except on designated, hardened trail prisms.	N		
Visual: Visual management activities will be consistent With riparian objectives.	N		
Wilderness: All wilderness activities are compatible in riparian areas, including natural fire, trail construction and use, and research.	N		

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife and Fish: All structural wildlife Improvements and snag preservation are compatible in riparian areas and are encouraged. These areas are suitable for winter range cover for big game, except in the Layng Creek watershed.	N		
Range: livestock use is permitted when consistent with allotment management plans and If riparian objectives are met. Locate watering structures and sailing, holding and loading areas outside riparian areas Direct trailing across, but not along, watercourses Within the riparian area.	N		
Timber: Where timber harvest can meet riparian objectives, natural regeneration and uneven-aged management is preferred. No site preparation, release, planting, precommercial thinning, firewood cutting or pesticide use are permitted except to meet riparian objectives. Yarding corridors are permitted at designated locations With full log suspension over the streambank and protected vegetation. Condors must minimize disturbance to riparian vegetation and meet riparian objectives.	N		
Timber: If effective shade or channel stability are reduced, shade or channel restoration is necessary for mitigation. Maintain existing deciduous/conifer mix of riparian vegetation. Maintain existing channel profile through vegetation rootmat In banks, and stable woody material In the channel.	N		
Soil and Water: Watershed improvement projects are compatible and desirable to meet riparian objectives. Soil restoration projects will take place as necessary to maintain or reduce sediment delivery to permanent streams. Plant vegetation where necessary to minimize soil movement.	P, R	P, B, ,	EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.5.1.3 & 4.5.2.4 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS App. F.4 POD Att. I POD Att. BB POD Att. DD
Soil and Water: Where existing shade or channel stability has been reduced, plant hardwoods along stream courses to provide shade where sufficient moisture occurs. Plant rapid-growing conifers on drier upper banks to provide long-term shade. Emphasize watershed improvement and watershed restoration In riparian areas where appropriate.	P, C, R, O	P, B, ,	EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.4.2.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.5.2.4 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. BB POD Att. DD

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Minerals: Rehabilitation of existing rock quarries or Pits by seeding and planting is compatible and desirable extraction or storage of common minerals, Including use and construction of rock pits, is discouraged in riparian areas when riparian objectives cannot be met. Panning or dredging In or adjacent to streams is compatible when carried out In accordance With Oregon Department of Fish and Wildlife recommendations, Oregon Department of Environmental Quality recommendations and riparian objectives. Special stipulations will be required for mineral leases when needed to protect riparian habitat. Operating plans for mining operations will Include reasonable, operationally feasible requirements to protect riparian values and to meet State water quality standards.	N		
Lands: On lands considered for exchange, a floodplain and wetland determination and assessment of Impacts, With public notice, are necessary on these streams and wetlands. Encourage the acquisition of riparian lands that may be of significant wildlife or fisheries value Special use applications must show compatibility With riparian objectives before being awarded.	N		
Facilities: Roads crossing riparian areas are compatible with the prescription when mitigation measures are employed to prevent sediment delivery to streams and lakes, effective shade is replaced, and protection is provided at water crossings from flood peaks and their resulting channel impacts.	P, C, R, O	P, B	EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. DD
Facilities: Utility/transportation corridors, roads or transmission lines may cross but must not parallel streams and lake shores within the riparian unit. Pesticides may not be used In the riparian unit. Buildings and other structures should conform to management direction in timber and recreation program elements for vegetation disturbance and sanitation, respectively. Open canals and site occupancy related to hydropower projects are not compatible.	P, C, R, O	P, B, R,	EIS Sec. 2.1.3.3 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS App. F.2, F.4 .
Facilities: Before investment In new buildings or other faculties, a floodplain and wetland determination and assessment of Impacts, with public notice, are necessary on these streams and wetlands.	P	P	EIS Sec. 1.5 EIS Secs. 4.3.2.2 & 4.3.3.2 EIS Sec. 4.3.4.1 EIS Sec. 4.7.3.5 EIS App. J
Protection: Activities which minimize both prescribed fire and wildfire damage to riparian vegetation are necessary. Rehabilitation of disturbance from suppression activities must be planned, Including erosion control, channel storage structures, and streambank stabilization. Utilize the appropriate suppression responses that will minimize damage to riparian vegetation. Measures must be taken to prevent burning riparian vegetation during slash disposal adjacent to streams. These measures include hand piling slash, not burning, burning one side of a unit at a time, low-intensity burning, or hose-lays to protect riparian vegetation. Firelines should be constructed outside the riparian unit.	P, C, R, O	P, B,	EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.4 POD Att. I POD Att. DD

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Protection: Insect and disease control practices allowed when riparian objectives can be met.	N		
Protection: No pesticide use is permitted In riparian units during the season when flow occurs (seasonally In ephemeral streams and year-round In perennial streams).	P, C, R, O	P, B	EIS Sec. 2.8 EIS Sec. 4.4.1.3 EIS Sec. 4.5.2.4 EIS Sec. 4.7.3.5 EIS App. F.4 POD Att. N
Prescription C2-III: Riparian Area Class IV Streams, Lakes and Ponds			
Recreation: Recreation Improvements and trail locations are designed to protect vegetation which is stabilizing channels, banks and sideslopes. Sanitary facilities are discouraged; If necessary, they must adequately treat wastes consistent with State DEQ regulations. Existing recreation developments are maintaining existing water quality and wildlife habitat.	N		
Recreation: ORV use is not permitted except on designated, hardened trail prisms.	N		
Visual: Visual management activities will be consistent With riparian objectives.	N		
Wilderness: All Wilderness activities are compatible In riparian areas, Including natural fire, trail construction and use, and research.	N		
Wildlife and Fish: All wildfire activities are compatible In riparian areas, Including use as winter range forage or cover, consistent With riparian objectives.	N		
Range: Livestock use is permitted when consistent with allotment management plans If riparian objectives are met. Locate watering structures and salting, holding and loading areas outside riparian areas. Direct trailing across, but not along, watercourses Within the riparian area.	N		
Timber: Where timber harvest can meet riparian objectives, protection of understory, natural regeneration and all-aged limber management is preferred. Special logging procedures, including jacking to directionally fall trees, will be used where effective Where natural regeneration is not practical, planting for timber management and riparian protection is encouraged No commercial or personal-use firewood cutting permitted. No firewood cutting or gathering for onsite use permitted.	N		
Soil and Water: Watershed improvement projects are compatible and desirable to meet riparian objectives. Soil restoration projects will take place as necessary to maintain or reduce sediment delivery to permanent streams. Plant vegetation where necessary to minimize soil movement. Where existing shade or channel stability has been reduced, plant hardwoods along stream courses to provide shade where sufficient moisture occurs. Plant rapid-growing conifers on drier upper banks to provide long-term shade. Emphasize watershed Improvement in riparian areas where appropriate.	P, R	P, ,	EIS Sec. 2.1.4 EIS Secs. 4.7.3.4 - 4.7.3.6 EIS Secs. 4.5.1.3 & 4.5.2.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. BB POD Att. DD

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Minerals: Rehabilitation of existing rock quarries or pits by seeding and planting is compatible and desirable. Extraction or storage of common minerals, Including use and construction of rock pits, is discouraged In riparian areas when riparian objectives cannot be met. Recreational panning or dredging In or adjacent to streams is compatible when carried out In accordance with Oregon Department of Fish and Wildlife recommendations, Oregon Department of Environmental Quality recommendations and riparian objectives Special stipulations will be required for mineral leases when needed to protect riparian habitat Operating plans for mining operations will Include reasonable, operationally feasible requirements to protect riparian values and to meet State water quality standards.	N		
Lands: Encourage the acquisition of riparian lands that may be of significant wildlife or riparian value Special use applications must show compatibility With riparian objectives before being awarded.	N		
Facilities: Roads crossing riparian areas are compatible with the prescription when mitigation measures are employed to prevent sediment delivery to streams and lakes, and to protect water crossings from flood peaks and resulting channel impacts. Utility/transportation corridors, roads or transmission lines may cross but must not parallel streams and lake shores within the riparian area. Pesticides may not be used In the riparian unit during the season when flow occurs. Buildings and other structures should conform to management direction In timber and recreation program elements for vegetation disturbance and sanitation, respectively. Open canals and site occupancy related to hydropower projects are not compatible	P, C, R, O	P, B, ,	EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.4 POD Att. I POD Att. DD.
Protection: Activities which minimize both prescribed fire and Wildfire damage to riparian vegetation are necessary. Rehabilitation of disturbance from suppression activities must be planned, Including erosion control, channel storage structures, and streambank stabilization Utilize the appropriate suppression responses that will minimize damage to riparian vegetation Measures must be taken to prevent burning riparian vegetation during slash disposal adjacent to streams These measures Include handpillng slash, not burning, burning one Side of a unit at a time, low-Intensity burning, or hose-lays to protect riparian vegetation. Firelines should be constructed outside the riparian unit.	P, R, C, O	P, R, B, ,	EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.4 POD Att. I POD Att. DD
Protection: Insect and disease control practices allowed when riparian objectives can be met	N		
Protection: No pesticide use is permitted in riparian units during the season when flow occurs (seasonally In ephemeral streams and year-round In perennial streams).	N		

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Prescription C2-IV: Fish Habitat Class I and II Streams, Lakes and Ponds			
Recreation: Recreation facilities and trail locations are designed to protect vegetation which is providing shade, stabilizing banks and sideslopes, or serving as existing or future fish habitat source (woody material for Class I and II streams). Sanitary facilities are discouraged In riparian areas and must adequately treat wastes consistent with DEQ regulations. Existing recreation developments are maintaining existing water quality, fish, and wildlife habitat. Before investment In new campgrounds or other facilities are undertaken, a floodplain and wetland determination and assessment of impacts, with public notice, are necessary on these streams and wetlands.	N		
Recreation: ORV use is not permitted except on designated, hardened trail prisms.	N		
Visual: Visual management activities will be consistent with riparian objectives.	N		
Wilderness: All Wilderness activities are compatible in riparian areas, Including natural fire, trail construction and use, and research.	N		
Wildlife and Fish: All fish habitat Improvement projects, structural wildlife Improvements and snag preservation are compatible In riparian areas, and encouraged. Provide structural and nonstructural improvement projects where It has been determined that fish production is below potential due to habitat restrictions. These areas are Suitable for winter range cover for big game	P, R	P,	EIS Sec. 2.1.4 EIS Secs. 4.5.1.3 & 4.5.2.4 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. DD
Wildlife and Fish: Write fish habitat management plans for major drainages within two years of completion of sub-basin analysis for those drainages	N		
Range: Livestock use is permitted when consistent with allotment management plans if riparian objectives are met. Locate watering structures and salting, as well as holding and loading areas outside riparian areas. Direct trailing across, but not along, watercourses within the riparian area.	N		
Timber: No timber harvest, site preparation, release, planting, precommercial thinning, firewood cutting or pesticide use are permitted except to meet riparian objectives. Salvage harvest is restricted to catastrophic occurrences (>50 percent of existing stand), when timber not necessary for fish habitat, water quality, wildlife habitat or soil productivity may be removed in consultation with a fishery biologist or hydrologist. Yarding corridors are permitted at designated locations with full log suspension over the streambank and protected vegetation Corridors must minimize disturbance to riparian vegetation and meet riparian objectives. If effective shade or fish habitat is reduced, shade or habitat restoration is necessary for mitigation Maintain existing deciduous/conifer mix of riparian vegetation Maintain existing channel profile through vegetation rootmat In banks, and with stable woody material In the channel.	N		

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Soil and Water: Watershed improvement projects are compatible and desirable to meet riparian objectives. Soil restoration projects will take place as necessary to maintain or reduce sediment delivery to permanent streams. Plant vegetation where necessary to minimize soil movement. Where existing shade has been reduced, plant hardwoods along stream courses to provide shade where sufficient moisture occurs Plant rapid-growing conifers on drier upper banks to provide long-term shade. Inventory and actively rehabilitate all Identified bank and sideslope failures, channel downcutting, and unshaded stream reaches to Improve existing water quality.	P, R	P, B, ,	EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.5.1.3 & 4.5.2.4 EIS Secs. 4.7.3.4 - 4.7.3.6 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. BB POD Att. DD
Minerals: Rehabilitation of existing rock quarries or Pits by seeding and planting is compatible and desirable. Extraction or storage of common minerals, Including use and construction of rock pits, is discouraged In riparian areas when riparian objectives cannot be met. Recreational panning or dredging in or adjacent to streams is compatible when earned out In accordance With Oregon Department of Fish and Wildlife recommendations, Oregon Department of Environmental Quality recommendations and riparian objectives Special stipulations will be required for mineral leases when needed to protect riparian habitat. Operating plans for mining operations will include reasonable, operationally feasible requirements to protect riparian values and to meet State water quality standards.	N		
Lands: On lands considered for exchange, a floodplain and wetland determination and assessment of Impacts, With public notice, is necessary on these streams and wetlands. Encourage the acquisition of riparian lands that may be of Significant wildlife or fisheries value Special use applications must show compatibility With riparian objectives before being awarded.	N		
Facilities: Allow for free fish passage on all Class I and II streams and lakes. Roads crossing riparian areas are compatible with the prescription when mitigation measures are employed to prevent sediment delivery to streams and lakes, to replace effective shade, and to protect water crossings from flood peaks and resulting channel impacts. Utility/transportation corridors, roads or transmission lines may cross but must not parallel streams and lake shores within the riparian unit.	P, C, R, O	P, B,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. BB POD Att. DD
Facilities: Pesticides may not be used in the riparian Unit. Buildings and other structures should conform to management direction in timber and recreation program elements for vegetation disturbance and sanitation, respectively. Open canals and site occupancy related to hydropower projects are not compatible. Before Investment In new campgrounds or other facilities, a floodplain and wetland determination and assessment of Impacts, with public notice, is necessary on these streams and wetlands.	N		

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Protection: Activities which minimize both prescribed fire and wildfire damage to riparian vegetation are necessary. Rehabilitation of disturbance from suppression activities must be planned, Including erosion control, channel storage structures, and streambank stabilization. Utilize the appropriate suppression responses that will minimize damage to riparian vegetation. Measures must be taken to prevent burning riparian vegetation during slash disposal adjacent to streams. These measures include handpiling slash, not burning, burning one side of a unit at a time, low-intensity burning, or hose-lays to protect riparian vegetation. Firelines should be constructed outside the riparian unit.	P, C, R, O	P, B, ,	EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. DD
Protection: Insect and disease control practices are allowed when riparian objectives can be met.	P, C, R, O	P, B	EIS Sec. 2.8 EIS Sec. 4.4.1.3 EIS Sec. 4.5.1.3 & 4.5.2.4 EIS Sec. 4.7.3.5 EIS App. F.4 POD Att. N
Protection: No pesticide use is permitted in riparian units during the season when flow occurs (seasonally In ephemeral streams and year-round in perennial streams). Fire retardant may not be applied to fish-producing (Class I and II) streams or lakes.	P, C, R, O	P, B	EIS Sec. 2.8 EIS Sec. 4.4.1.3 EIS Sec. 4.5.1.3 & 4.5.2.4 EIS Sec. 4.7.3.5 EIS App. F.4 POD Att. N
Prescription C2-V: Fish Habitat Class III Streams			
Recreation: Recreation facilities and trail locations are designed to protect vegetation which is providing shade, stabilizing banks and sideslopes, or serving as aquatic food source. Sanitary facilities are discouraged and must adequately treat wastes consistent with State DEQ regulations Existing recreation developments are maintaining existing water quality, fish, and wildlife habitat Before Investment In new campgrounds and other facilities, a floodplain and wetland determination and assessment of Impacts, with public notice, are necessary on these streams and wetlands.	N		
Recreation: ORV use is not permitted except on designated, hardened trail prisms.	N		
Visual: Visual management activities will be consistent With riparian objectives.	N		
Wilderness: All wilderness activities are compatible In riparian areas, including natural fire, trail construction and use, and research.	N		
Wildlife and Fish: All structural wildlife improvements and snag preservation are compatible In riparian areas and are encouraged These areas are suitable for winter range cover for big game.	P, R	P,	EIS Sec. 2.1.4 EIS Secs. 4.5.1.3 & 4.5.2.4 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. DD

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Range: Livestock use is permitted when consistent With allotment management plans and if riparian objectives are met. Locate watering structures and salting, holding and loading areas outside riparian areas Direct trailing across, but not along, watercourses within the riparian area.	N		
Timber: Where timber harvest can meet riparian objectives, natural regeneration and uneven-aged management is preferred. No site preparation, release, planting, precommercial thinning, firewood cutting or use, or pesticide use are permitted except to meet riparian objectives. Yarding Corridors are permitted at designated locations With full log suspension over the streambank and protected vegetation corridors must minimize disturbance to riparian vegetation and meet riparian objectives. If effective shade or channel stability are reduced, shade or channel restoration is necessary for mitigation. Maintain existing deciduous/conifer mix of riparian vegetation. Maintain existing channel profile through vegetation rootmat In banks, and stable woody material In the channel	N		
Soil and Water: Watershed improvement projects are compatible and desirable to meet riparian objectives. Soil restoration projects will take place as necessary to maintain or reduce sediment delivery to permanent streams Plant vegetation where necessary to minimize soil movement. Where existing shade has been reduced, plant hardwoods along stream courses to provide shade where sufficient moisture occurs. Plant rapid-growing conifers on drier upper banks to provide long-term shade. Inventory and actively rehabilitate all identified bank and sideslope failures, channel downcutting, and unshaded stream reaches to Improve existing water quality.	P, R	P,	EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.5.1.3 & 4.5.2.4 EIS Secs. 4.7.3.4 - 4.7.3.6 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. BB POD Att. DD
Minerals: Rehabilitation of existing rock quarries or pits by seeding and planting is compatible and desirable Extraction or storage of common minerals, including use and construction of rock pits, is discouraged In riparian areas when riparian objectives cannot be met. Recreational panning or dredging in or adjacent to streams is compatible when carried out In accordance with Oregon Department of Fish and Wildlife recommendations, Oregon Department of Environmental Quality recommendations and riparian objectives. Special stipulations will be required for mineral leases when needed to protect riparian habitat. Operating plans for mining operations will Include reasonable, operationally feasible requirements to protect riparian values and to meet State water quality standards.	N		
Lands: On lands considered for exchange, a floodplain and wetland determination and assessment of impacts, with public notice, is necessary on these streams and wetlands. Encourage the acquisition of riparian lands that may be of significant Wildlife or fisheries value. Special use applications must show compatibility with riparian objectives before being awarded	N		

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Facilities: Roads crossing riparian areas are compatible with the prescription when mitigation measures are employed to prevent sediment delivery to streams and lakes, effective shade is replaced, and protection is provided at water crossings from flood peaks and their resulting channel impacts.	P, C, R, O	P, B, ,	EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. DD
Facilities: Utility/transportation corridors, roads or transmission lines may cross but must not parallel streams and lake shores Within the riparian unit. Pesticides may not be used in the riparian unit. Buildings and other structures should conform to management direction in timber and recreation program elements for vegetation disturbance and sanitation, respectively. Open canals and site occupancy related to hydropower projects are not compatible. Before investment In new buildings or other facilities, a floodplain and wetland determination and assessment of Impacts, with public notice, are necessary on these streams and wetlands.	P, C, R, O	P, ,	EIS Sec. 2.1.3.3 EIS Sec. 2.8 EIS Sec. 4.4.1.3 EIS Sec. 4.5.2.4 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS App. F.2, F.4 POD Att. N
Protection: Activities which minimize both prescribed fire and Wildfire damage to riparian vegetation are necessary. Rehabilitation of disturbance from suppression activities must be planned, Including erosion control, channel storage structures, and streambank stabilization. Utilize the appropriate suppression responses that will minimize damage to riparian vegetation. Measures must be taken to prevent burning riparian vegetation during slash disposal adjacent to streams These measures include handpiling slash, not burning, burning one Side of a unit at a time, low-Intensity burning, or hose-lays to protect riparian vegetation. Firelines should be constructed outside the riparian unit.	P, C, R, O	P, ,	EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. DD
Protection: Insect and disease control practices allowed when riparian objectives can be met.	N		
Protection: No pesticide use is permitted In riparian units during the season when flow occurs (seasonally In ephemeral streams and year-round 10 perennial streams).	N		
Prescription C2-IV: Fish Habitat Class IV Streams			
Recreation: Recreation Improvements and trail locations are designed to protect vegetation which is stabilizing channels, banks and sideslopes. Sanitary facilities are discouraged; If necessary, they must adequately treat wastes consistent with State DEQ regulations Existing recreation developments are maintaining existing water quality and Wildlife habitat.	N		
Recreation: ORV use is not permitted except on designated, hardened trail prisms.	N		
Visual: Visual management activities will be consistent with riparian objectives	N		

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Wilderness: All Wilderness activities are compatible In riparian areas, Including natural fire, trail construction and use, and research.	N		
Wildlife and Fish: All wildlife activities are compatible In riparian areas, Including use as winter range forage or cover, consistent With riparian objectives	N		
Range: Livestock use is permitted when consistent With allotment management plans and meets other resource objectives. Locate watering structures and salting, holding and loading areas outside riparian areas Direct trailing across, but not along, watercourses Within the riparian area.	N		
Timber: Where timber harvest can meet riparian objectives, protection of understory natural regeneration, and all-aged timber management is preferred. Special logging procedures, Including Jacking to directionally fall trees, will be used where effective. The chief difference between this prescription and C2-11J is that slash and residual vegetation will be protected from prescribed fire In MA 12, the NO-harvest Prescription C2-X will be used where burning risks are high. Where natural regeneration is not practical, planting for timber management and riparian protection is encouraged. No pesticide use is permitted in riparian units during the season when flow occurs.	N		
Timber: No commercial or personal-use firewood cutting permitted. No firewood cutting or gathering for onsite use permitted.	N		
Soil and Water: Watershed improvement projects are compatible and desirable to meet riparian objectives. Soil restoration projects will take place as necessary to maintain or reduce sediment delivery to permanent streams Plant vegetation where necessary to minimize Soil movement Where existing shade has been reduced, plant hardwoods along stream courses to provide shade where sufficient moisture occurs. Plant rapid-growing conifers on drier upper banks to provide long-term shade. Inventory and actively rehabilitate all Identified bank and sideslope failures, channel downcutting, and unshaded stream reaches to Improve existing water quality.	P, R	P,	EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.5.1.3 & 4.5.2.4 EIS Secs. 4.7.3.4 - 4.7.3.6 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. BB POD Att. DD
Minerals: Rehabilitation of existing rock quarries or Pits by seeding and planting is compatible and desirable. Extraction or storage of common minerals, Including use and construction of rock Pits, is discouraged In riparian areas when riparian objectives cannot be met. Panning or dredging in or adjacent to streams is compatible when carried out In accordance with Oregon Department of Fish and Wildlife recommendations, Oregon Department of Environmental Quality recommendations and other riparian objectives Special stipulations will be required for mineral leases when needed to protect riparian habitat. Operating plans for mining operations will include reasonable, operationally feasible requirements to protect riparian values and to meet State water quality standards.	N		
Lands: Encourage the acquisition of riparian lands that may be of significant Wildlife or riparian value. Special use applications must show compatibility With riparian objectives before being awarded.	N		

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Facilities: Roads crossing riparian areas are compatible with the prescription when mitigation measures are employed to prevent sediment delivery to streams and lakes, and to protect water crossings from flood peaks and resulting channel Impacts. Utility/transportation corridors, roads or transmission lines may cross but must not parallel streams and lake shores Within the riparian area. Pesticides may not be used In the riparian unit during the season when flow occurs. Buildings and other structures should conform to management direction In timber and recreation program elements for vegetation disturbance and sanitation, respectively Open canals and Site occupancy related to hydropower projects are not compatible.	P, C, R, O	P, B, ,	EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. DD
Protection: Activities which minimize both prescribed fire and Wildfire damage to riparian vegetation are necessary. Rehabilitation of disturbance from suppression activities must be planned, Including erosion control, channel storage structures, and stream bank stabilization. Utilize the appropriate suppression responses that will minimize damage to riparian vegetation. Measures must be taken to prevent burning riparian vegetation during slash disposal adjacent to streams. These measures Include handpiling slash, not burning, burning one Side of a unit at a time, low-Intensity burning, or hose-lays to protect riparian vegetation. Firelines should be constructed outside the riparian unit.	P, C, R, O	P, B, ,	EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. DD 3.
Protection: Insect and disease control practices allowed when riparian objectives can be met.	N		
Protection: No pesticide use is permitted In riparian units during the season when flow occurs (seasonally In ephemeral streams and year-round in perennial streams).	N		
Prescription C2-VII: North and South Umpqua/Steamboat Fish Resting Holes			
Not Applicable, Excluded From Table			
Prescription C2-VIII: Riparian Class I Streams with Demonstrated Unique Anadromous Fish Populations			
Not Applicable, Excluded From Table			
Prescription C2-IX, Steamboat Fish Habitat Class III Streams			
Not Applicable, Excluded From Table			
Prescription C2-X, Steamboat Fish Habitat Class IV Streams			
Not Applicable, Excluded From Table			
Prescription C3-I: Peregrine Falcon			
Recreation: No new trails or other recreation facilities will be constructed within 5 miles of nest site. Public access and use may be restricted January 1 - July 31 each year.	N		
Recreation: ORV use closed during January 1 - July 31	N		
Visual: Minimum visual quality objective is partial retention within areas, and as directed by Forestwide visual standards and guidelines.	N		

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Wildlife and Fish: These sites are high priority for annual monitoring. Any proposed enhancement project or management technique must be reviewed and coordinated with the USDI Fish and Wildlife Service.	N		
Range: The area within a 20-chaln radius of any nest site will be excluded from any future range allotments. No special use livestock structures permitted.	N		
Timber: No programmed harvest Within the Immediate vicinity of the nest site. Restrict timber harvest activity between January 1 - July 31 as needed to reduce disturbance during nesting season. Within a 5-mile radius of nest Site, If determined necessary, restrict timber sale activity during January 1 - July 31. Review all timber sales in the 1.5-mlle zone With USDI Fish and Wildlife Service	P,C	P	EIS 4.5.1.2 & 4.5.1.3 MIS Report EIS App. F.6
Timber: Within three-mile radius of nest, manage harvest schedule to provide a diversity of age classes. Maintain 50 percent of the stands In pole size or larger. Where possible, leave five or more hardwoods per acre in regeneration units. Modify herbicide application to provide at least 25 percent of the original hardwood component. Manage snags at 40 percent or more of potential population capacity.	N		
Timber: Firewood cutting limited to same specifications as timber harvest activities. Gathering of firewood is limited to that needed for onsite use.	N		
Soil and Water: Activities prohibited as described above in timber element. Soil and water enhancement permissible if snags are not removed.	N		
Minerals: Subject to determination of values, including mineral values, all area within the boundaries of the site will be considered for recommendation for withdrawal from mineral entry If necessary to maintain the Integrity of existing cliff or tree nest Sites, Extraction of common variety minerals shall not be permitted.	N		
Lands: These lands should not be considered available for exchange or transfer Land acquisitions are encouraged.	N		
Facilities: Roads Within 5 miles may be blocked permanently or closed to use January 1 – July 31, If needed to reduce disturbance during nesting season Road construction or reconstruction within 1.5 miles will not normally take place during January 1 - July 31 New utility and transportation corridors will be discouraged. Where no reasonable alternatives exist, Corridors will be located to Impose the least Impact as determined In the EA process.	N		
Protection: High priority areas for fire suppression using appropriate suppression response. Law enforcement protection is high Priority.	N		
Protection: No use of chemicals to control Insect and disease outbreaks Within the 1.5-mile radius except under recommendation from US Fish and Wildlife Service.	N		
Prescription C3-II: Bald Eagle, Maintained – Not Applicable, Excluded From Table			

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Prescription C4-I: Winter Range – Normal – Not Applicable, Excluded From Table			
Prescription C4-II: Four-Part Winter Range - Optimum – Not Applicable, Excluded From Table			
Prescription C5-I: Wildlife - Unique Habitat – Not Applicable, Excluded From Table			
Prescription C5-III: Wildlife - Mosaic Habitats – Not Applicable, Excluded From Table			
Prescription C5-V: Wildlife – Management of Unsuitable Timberlands			
Not Applicable, Excluded From Table			
Prescription C5-VI: Wildlife – Snag Management Areas			
Not Applicable, Excluded From Table			
Prescription C5-VII: Wildlife – Pileated-Woodpecker			
Not Applicable, Excluded From Table			
Prescription C5-VIII: Wildlife – Pileated-Woodpecker			
Not Applicable, Excluded From Table			
Prescription C5-IX: Wildlife - Pine Marten, Dedicated			
Not Applicable, Excluded From Table			
Prescription C5-X: Wildlife - Pine Marten (Managed)			
Not Applicable, Excluded From Table			
Prescription E1-I: Timber - Intensive PNV			
Not Applicable, Excluded From Table			
Prescription E1-II: Timber - Intensive Volume			
Not Applicable, Excluded From Table			
Prescription E1-IV: Low Intensity Timber Management			
Not Applicable, Excluded From Table			
Prescription E1-V: Timber - Intensive Short Rotation			
Not Applicable, Excluded From Table			
Prescription E2-1: Research Natural Area			
Not Applicable, Excluded From Table			

TABLE 2.1-1

Umpqua National Forest Land And Resource Management Plan

Element	Applicable	Consistency	Comment
Prescription E2-II: Undeveloped Ecosystems			
Not Applicable, Excluded From Table			
Prescription E3-I: Experimental Forest			
Not Applicable, Excluded From Table			
Prescription F1-II: Layng Creek Municipal Watershed			
Not Applicable, Excluded From Table			
Prescription J1-II: Maintenance of Existing Conditions			
Not Applicable, Excluded From Table			

2.2 ROGUE RIVER NATIONAL FOREST LAND AND RESOURCE MANAGEMENT PLAN – 1990

Project consistency with this LRMP is addressed in Table 2.2-1 below.

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Minimum Management 01			
Recreation - Roaded Natural: Manage the area for at least Maximum Modification Visual Quality Objective. Assess the impacts to visual resources in the project environmental analysis. Specifically address how the visual quality objective will be met.	N		
Recreation - Roaded Natural: Manage any trails that pass through this management area in a manner not m conflict with good stewardship management.	N		
Recreation - Roaded Natural: Identify the potential effect of any proposed activity on recreation opportunity spectrum classes in all project environmental analysis.	N		
Recreation - Roaded Natural: Protect Special Dispersed Features, including trawls, from adverse Impacts until management of the special dispersed feature is addressed in an environmental analysis.	N		
Recreation - Roaded Natural: Investigate area to inventory archaeological, historical or other cultural resource properties which may be located within the proposed "area of effect" of prefects or elsewhere Document results of the investigation/ Inventory in the project environmental analysis Inventory of non-prefect areas will be guided by the Forest's cultural resource inventory strategy.	N		
Recreation - Roaded Natural: Evaluate the cultural resources found within the area using a qualified cultural resource specialist, to determine their potential archaeological, historical or cultural significance. Evaluate cultural resources on a project-specific basis or by thematic/multi-resource group If a cultural resource is discovered after project activity has begun, the activity will cease or be modified until an evaluation of significance can be made.	N		
Recreation - Roaded Natural: Assess the Impacts of a proposed action to determine the effect of the project upon potentially or known significant cultural resources.	N		
Recreation - Roaded Natural: Mitigate potential adverse impacts to significant cultural resources by redesigning the project to avoid damage or disturbance or implementing appropriate mitigation procedures to reduce the adverse Impact to the resource	N		
Recreation - Roaded Natural: Inventory and protect cultural resources to insure that values are not damaged or destroyed until they can be evaluated for scientific study, interpretation or other appropriate uses Protection of values may Include maintenance of structures, avoidance of the site, or scientific removal, analysis and reporting	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Recreation - Roaded Natural: Evaluate and enhance cultural resources for scientific, educational, recreational and ethnic use to the extent the integrity of the resource is maintained Use will be carefully monitored.	N		
Recreation - Roaded Natural: Develop and administer schedules for long-range cultural resource management. Coordinate cultural resource management with appropriate State and Federal agencies	N		
Recreation - Roaded Natural: Properties that meet the significance criteria will be treated as eligible to the National Register of Historic Places: eligible properties will be nominated to the National Register.	N		
Recreation - Roaded Natural: Off-road vehicle recreation use on roads, trails or areas is permissible if not in conflict with strategy goals and objectives.	N		
Wilderness: Project plans will assure that wilderness boundaries are not violated.	N		
Wildlife, Fish And Plants: Endangered, threatened and sensitive species (and species proposed for Federal listing by USDA Fish and Wildlife Service [PETS]) will be identified and managed In cooperation with the USDI Fish and Wildlife Service. Oregon Department of Fish and Wildlife. Oregon Department of Agriculture, Oregon Natural Heritage Database, and California Department of Fish and Game.	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6 EIS App. F.7 POD Att. J POD Att. DD
Wildlife, Fish And Plants: Legal and biological requirements for the conservation of listed and proposed endangered, threatened and sensitive plant and animal species shall be met. Habitat for existing federally-listed species shall be managed to achieve objectives of recovery plans	P, C, R, O	P, B, R, ,	EIS Sec. 1.5.1.1 EIS Sec. 1.5.3.5 EIS Secs. 1.5.4.1 & 1.5.4.4 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS App. F .7 POD Att. J POD Att. DD
Wildlife, Fish And Plants: Biological evaluations (FSM 2672 4) shall be prepared for each project authorized, funded or conducted on the Forest The biological evaluation shall be used to determine the possible effects the proposed activity will have on listed and PETS species The biological evaluation consists of five steps: a. Pre-field review of existing information, b. Field reconnaissance of the project area; c. Determination of whether local populations of listed and PETS species will be affected by a project, d. Analysis of the significance of project effects on local and total populations of listed and PETS species, e. When step four cannot be completed due to lack of information, a biological or botanical investigation is conducted to gather the information needed to complete step four.	P, R	P,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS App. F.7 POD Att. J POD Att. DD

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Wildlife, Fish And Plants: If endangered, threatened or proposed species are found in a project area, consultation requirements with the USDI Fish and Wildlife Service shall be met in accordance with the Endangered Species Act (Public Law 93-205) and FSM 2671 4. No adverse impacts on endangered, threatened or proposed species or their habitats shall occur except when It is possible to compensate adverse effects totally through alternatives identified in a biological opinion rendered by the USDI Fish and Wildlife Service (FSM 2670 31) Before a project can be carried out, protection or mitigation requirements shall be specified (NFMA, 36 CFR 219.27(a)(8)).	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS App. F.7 POD Att. J POD Att. L POD Att. DD
Wildlife, Fish And Plants: Northern Spotted Owl – Manage this species under the standards and guidelines established in the ROD for the Supplement to the Environmental Impact Statement for an amendment to the Pacific Northwest Regional Guide. In the event that a pair of northern spotted owls are found in an area, consideration will be given to (1) the need to improve the distribution of older forest ecosystems for all associated plant and animal species, (2) providing insight into management of spotted owl habitat areas (SOHA) through experimental habitat manipulation. During the planning and scheduling phase of any project activity that may impact spotted owl habitat, conduct a biological evaluation in order to determine the degree of impact and to provide for protective measures.	P, C, R, O	P, R, ,	EIS Secs. 1.5 EIS Sec. 2.1.4 EIS Sec. 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Secs. 4.7.3.4 & 4.7.3.6 EIS App. F.7 EIS App. F.3 POD Att. DD
Wildlife, Fish And Plants: Osprey - Protect active nests dung the nesting season. Land management activities having adverse potential impact should not occur within a 20-chain radius of the nest from March 1 to August 31. Nest and perch trees will be protected until they are no longer usable.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish And Plants: Goshawk - Nest sites will be protected from disturbing human activities during the nesting season. To maintain the physical suitability of nesting areas and prevent disturbances that may cause nesting failures, the period of protection will be from March 1 to August 31 for the area within 20 chains of an active nest. Each nest sate is assumed potentially active until June 1 If monitoring has shown that no nesting attempt has been initiated or that a nesting attempt has failed by June 1, the nest site will be considered inactive and the above nest site restriction may be waived. Monitoring will be supervised and evaluated by a qualified wildlife biologist. Goshawk nests will be protected within a 25-acre no-harvest buffer of trees unless other adjacent alternate buffers are available in a logical basis to maintain habitat over time.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish And Plants: Woodpeckers - (Cavity Nesters) Cavity nesting habitat will be allowed to occur at natural levels on coniferous forest lands This should provide 100 percent of the potential population level for cavity nesting species. This may require leaving green trees standing as well, in order to maintain the snags throughout the rotation Soft snags will not be removed except for protection or human safety. Snags should be uniformly distributed insofar as practical. Land areas containing activities which impact amounts of large woody materal (LWM) on the site shall have LWM management prescription(s). The prescription will not only be site specific but will also consider maintenance of LWM in perpetuity. At a minimum, a “moderate” amount of LWM will be left after project completion. The moderate range is 10 to 20 pieces of Class I and II logs per acre and all existing Class III, IV and V logs, except for incidental amounts removed during management activities.	P, C, R, O	P, R,	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS App. F.7 POD Att. P POD Att. U POD Att. DD
Wildlife, Fish And Plants: Resident Trout and Steelhead –Water quality law establishes a level of aquatic resource management that will maintain the Forest’s fisheries habitat at a level capable of sustaining or exceeding minimum viable populations for the various species of anadromous and resident fish. Cold water production for both on and off Forest fish needs is identified as a principal objective for the Forest’s streams. Maintain existing fish habitat capability and develop fish habitat improvement projects to fully utilize potential smelt production capability of Forest anadromous streams and resident fish in other streams and lakes. Coordinate land management activities with the California Department of Fish and Game and Oregon Department of Fish and Wildlife objectives Natural debris, plus trees needed for a future supply, will be maintained and managed to 1) enhance stream channel and bank structure so as to protect water quality, and 2) provide structural fish habitat to meet the objectives of small habitat capability or resident fish populations provided for in the Forest Plan.	P, C, R, O	P, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.5.2.3 & 4.5.2.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.7.3.5 EIS App. F.7 EIS App. F.4 POD Att. DD
Wildlife, Fish And Plants: Deer and Elk - Maintain summer range to provide forage, hiding and thermal cover. A restricted operating period from April 1 to June 30 may be imposed in identified deer or elk fawning or calving areas.	N		

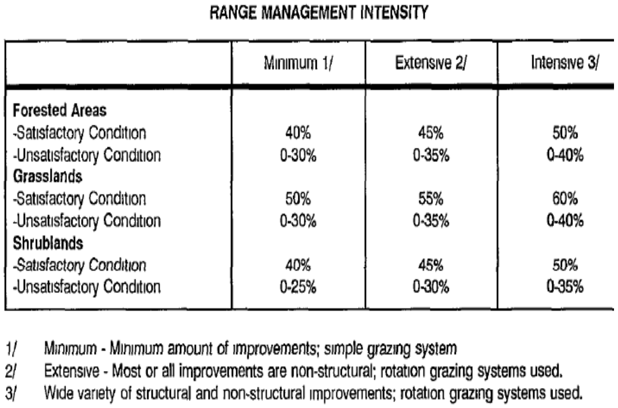
TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Wildlife, Fish And Plants: Bald Eagle - Develop a Bald Eagle site management plan for each nesting or roosting area as It is discovered Until a site specific management plan is developed, the following measures will apply. Establish the primary nesting zone to be a 330 foot radius around the nest and the secondary zone to be a 660 foot radius around the nest The following activities should not occur within the nesting zones and communal roosting sates. 1) Primary Zone-All human related activities unless the activities pre-existed to nest discovery and the eagles are apparently tolerant: 2) Secondary Zone - Major land uses such as development of commercial and industrial sites, home, road, powerline or other construction, oil drilling, surface mining, and spraying of chemicals which adversely affect eagles. Timber cutting to enhance habitat is permitted but there is no scheduled timber harvest, 3) Primary and Secondary Zones between January 1 and August 15.blasting, use of firearms, camping, picnicking, timber harvest, road and water access Into the nesting territory, and low level aircraft operations with helicopters no closer than 1,000 feet and with fixed wing no closer than 500 feet: 4) A communal roost is any stand of trees m which eagles regularly roost together The primary zone for roosting eagles is 330 feet from the roosting trees and the secondary zone is one-quarter of a mile from the roosting trees Large trees used as solitary roosts should be left along shoreline of lakes and streams wherever possible. Biological evaluation and informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2
Wildlife, Fish And Plants: Peregrine Falcon - Develop a Peregrine falcon site management plan for each nesting area found. The site plan design will be tailored to in the landscape and the use patterns established by the birds. The following may be included m the Plan 1) Delineate the nest site (eyrie): 2) Define primary (nesting) and secondary and tertiary zones associated with the eyrie; 3) Withdraw the nest site from mineral entry, 4) Restrict management activities and recreational use to September through January; 5) Allow no structural developments within the primary zone unless It benefits the species; 6) Maintain and/or enhance riparian habitats within a three-mile radius of the eyrie; 7) Develop water sources (springs, seeps, ponds, catchments) within approximately one-half mile radius of the eyrie: 8) Implement silvicultural prescriptions, prescribed fire or other management techniques to maintain a mosaic of all vegetative serial stages within the secondary and tertiary zones (approximately a three-mile radius of the eyrie): 9) Direct special emphases towards maintaining and/or enhancing mast- and berry-producing shrubs and trees which support lays, bandtail pigeon and other passerine birds. Biological evaluation and informal consolation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS App. F.7
Range: Provide annual permittee plans for livestock distribution and use patterns.	N		
Range: Write range allotment plans to reflect management direction for all lands within the allotment boundary. Allotment planning procedures are documented in FSM 2210.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Range: Develop Coordinated Resource Management Plans where possible and feasible to facilitate the Integrated resource management of range and other resources, and between agencies, permittees and other landowners.	N		
Range: Forage utilization standards will be incorporated In allotment management plans Allotment management plans may Include utilization standards which are lower or rarely higher when associated with intensive grazing systems and specific vegetation management objectives which will meet resource management objectives and the intent of the management strategy. The standards include cumulative annual use by big game and livestock Utilization for grass and grass like species is based on the percent of plant weight removed. Utilization for shrub species is based on Incidence of use, weight, and/or twig length (e g. utilization is 50 percent If 50 out of 100 leaders are browsed) Satisfactory condition is determined by allotment classification and/or forage condition. Unsatisfactory condition is anything not meeting satisfactory conditions Allowable use of available forage (Maximum percent of annual utilization by big game and livestock) IS:	N		
	N		

RANGE MANAGEMENT INTENSITY

	Minimum 1/	Extensive 2/	Intensive 3/
Forested Areas			
-Satisfactory Condition	40%	45%	50%
-Unsatisfactory Condition	0-30%	0-35%	0-40%
Grasslands			
-Satisfactory Condition	50%	55%	60%
-Unsatisfactory Condition	0-30%	0-35%	0-40%
Shrublands			
-Satisfactory Condition	40%	45%	50%
-Unsatisfactory Condition	0-25%	0-30%	0-35%

1/ Minimum - Minimum amount of improvements; simple grazing system

2/ Extensive - Most or all improvements are non-structural; rotation grazing systems used.

3/ Wide variety of structural and non-structural improvements; rotation grazing systems used.

Timber: Rehabilitate areas that have been impacted by catastrophic occurrences.	N		
Timber: In seed collections, no seed lot shall be represented by fewer than 15 families of trees of that species, well distributed across the breeding zone In addition, no family of parent trees shall represent greater than 20 percent of a seed lot. Strive for a natural seed source from a variety of species.	N		
Timber: Timber harvest is not programmed and would normally not occur except for the following situations: to eliminate hazards; removal incidental to construction or maintenance of improvements; minor unavoidable inclusions to logical management units; or in the case of natural catastrophe; and research and administrative studies when removal of such timber is not detrimental to achieving the goals of the management area.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Water: Evaluate effects of proposed projects on stream courses in all environmental analyses. Discuss pertinent stream classification and recommend changes where appropriate as a result of the environmental analyses.	P	P	EIS Sec. 1.5 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 EIS Sec. 4.7.3.5 EIS Secs. 4.3.2.2 & 4.3.3.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS App. F.4 POD Att. I POD Att. M POD Att. CC
Water: Comply with State requirements in accordance with the Clean Water Act of 1972, as amended (1977 and 1987) for protection of waters of the State of Oregon (Oregon Administrative Rules, Chapter 34041) and the State of California (Porter-Cologne Water Quality Control Act, Division 7) through planning, application, and monitoring of Best Management Practices (BMPs) in conformance with the Clean Water Act of 1972, as amended (1977 and 1987) regulations, and federal guidance issued thereto.	N		
Water: In cooperation with the States of Oregon and California, the Forest will use the following process. a. Select and design BMPs based on sate specific conditions, technical, economic, and institutional feasibility, and water quaky standards for those waters potentially Impacted; b. Implement and enforce BMPs; c. Monitor to Insure that practices are correctly applied as designed, Monitor to determine the effectiveness of practices in meeting design expectations and in attaining water quality standards; d. Evaluate monitoring results and mitigate where necessary to minimize impacts from activities where BMPs do not perform as expected; e. Adjust BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level. Evaluate the appropriateness of water quality criteria for reasonably assuming protection of beneficial uses. Consider recommending adjustment of water quality standards; f. Use the existing agreed to process to Implement the State Water Quality Management Plan on lands administered by the USFS as described in Memorandums of Understanding between 1) the Oregon Department of Environmental Quaky and US. Department of Agriculture, Forest Service (2/12/79 and 12/7/82), and Attachments A and B' referred to in thus MOU (Implementation Plan for Water Quaky Planning on National Forest lands in the Pacific Northwest 12/78 and Best Management Practices for Range and Grazing Activities on Federal lands) and 2) the State Water Resources Control Board, State of California, and U.S. Department of Aquaculture Forest Service, Pacific Southwest Region, 1981.	P, C, R, O	P, B	EIS Sec. 1.5 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.7.1 & 2.7.2 EIS Sec. 4.7.3.5 EIS Secs. 4.3.2.2 & 4.3.3.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS App. F.4 POD Att. I POD Att. M POD Att. CC

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Water: The following requirements will be employed in project implementation when proposed projects may affect streams: a. Determine restricted distance from streams for equipment operation, type of stream crossing, if crossing is needed, and erosion control methods needed, b. Consider relation of project to riparian strategy areas (all streams classed as I, II and Ill are allocated to Strategy 26), c. Locate springs that may be affected and evaluate for appropriate levels of protection. Thus would usually require consultation with soil, water or geology specialists; d. In project planning, consider basin constraint percentages by subwatershed.	P, R	P, B, R, ,	EIS Sec. 2.1.4 EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.7.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS Sec. 4.1.2.5 EIS Secs. 4.3.1.2, 4.3.2.2 & 4.3.3.2 EIS App. F.4 POD. Att. 3 POD Att. I POD Att. W POD Att. X POD Att. BB POD Att. DD
Water: Acquire water nights for development of non-reserved uses.	N		
Water: Design project water monitoring as appropriate.	P	P, B	EIS Secs. 2.3.2.1 & 2.1.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.7.1 & 2.7.2 POD Att. I POD Att. M POD Att. CC
Water: Allow for watershed restoration projects.	P, R	P, B, R,	EIS Sec. 2.1.4 EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.7.2 EIS Sec. 4.1.2.5 EIS Secs. 4.3.1.2, 4.3.2.2 & 4.3.3.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. C POD Att. I POD Att. W POD Att. X POD Att. BB POD Att. DD
Water: In-stream flows on National Forest lands should be protected through critical analysis of proposed water uses, diversion and transmission applications and renewal of permits.	N		
Water: Insure that proposed projects have no adverse effects on snow survey sates included in the Regional Forester's memorandum of understanding with the Soil Conservation Service.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Minerals: Develop and manage new and existing aggregate sources in compliance with approved Rock Resource Development Plan and an approved environmental analysis.	N		
Minerals: Under mining laws, claimants are entitled to access to their mining claims Access for exploration and development of locatable mrnera1 resources will be analyzed in response to a proposed operating plan A decision on approval of reasonable access will be made as a result of appropriate environmental analyses.	N		
Minerals: Operating plans for mining operations will be processed in a timely manner in accordance with 36 CFR 228.	N		
Minerals: In plans of operation, require operationally feasible provisions designed to protect riparian and fishery values: meet State water quality standards, and insure that disturbed areas are reclaimed Insofar as practicable to a productive condition.	N		
Minerals: Reclamation plans will Identify management objectives for disturbed areas and detail the procedures and time frames necessary to accomplish the objectives. Reclamation bonds will be based on actual reclamation costs and formulated using technical and other resource input.	N		
Human and Community Development: Conduct compliance reviews as required by Title VI of the Civil Rights Act of 1964, and established Forest Service standards.	N		
Human and Community Development: Inform the general public, including minorities and the underprivileged, of availability and benefits which they are eligible to receive from Forest programs. Techniques to increase awareness and participation will be used.	N		
Human and Community Development: As directed by the American Indian Religious Freedom Act, the Forest will protect and preserve for Native Americans their inherent right of freedom to believe, express and exercise the traditional religions on Forest lands This includes, but is not limited to, access to ceremonial sites, use and possession of sacred objects, and the freedom to worship through traditional ceremonies and rites.	N		
Human and Community Development: Identify opportunities for the Forest to coordinate resource activities compatible with interests of surrounding Indian tribes.	N		
Human and Community Development: Identify opportunities for the Forest to coordinate resource activities with the interest of adjacent communities.	N		
Lands: Revise all special use permits to be consistent with the direction in thus management strategy when renewed.	N		
Lands: Utilize residual capacity in existing utility corridors when applications for rights-of-ways from public or private entities are received. Analyze any additional corridors with an environmental analysis.	N		
Lands: Use control measures to prohibit livestock access to chemically treated corridors.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Lands: Direct applications for electronic sties toward use of sites in the following order: a. Utilizing residual capacity of existing sites, b. Develop new sites identified in the Forest-wide Electronic Site Plan.	P	P	EIS Sec. 2.1.2.2 EIS Sec. 2.3.2.3 EIS Sec. 4.2.2.2 POD Att. D
Lands: Establish and maintain property boundaries on lands administered by the Forest Service.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. U POD Att. 21
Soils: Address the potential for detrimental soil displacement, compaction, peddling, severe burning, mass wasting and surface soil erosion In project environmental analysis.	P	P, B,	EIS Sec. 1.5 EIS Sec. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Sec. 4.7.3.4 POD Att. I
Soils: Alternative management practices will be developed or mitigating measures planned and Implemented when activities are Likely to result In detrimental displacement, compaction, mass wasting or erosion.	P, C, R	P, B,	EIS Sec. 1.5 EIS Sec. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Sec. 4.7.3.4 POD Att. I
Soils: No more than 10 percent of an activity area should be compacted, puddled or displaced upon completion of project (not including permanent roads or landings). No more than 20 percent of the area should be displaced or compacted under circumstances resulting from previous management practices including roads and landings. Permanent recreation facilities or other permanent facilities are exempt.	P, C, R	P, B, A	EIS Sec. 1.5 EIS Sec. 2.1.3.4 EIS Sec. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Sec. 4.7.3.4 POD Att. I LRMP Amendment RRNF-6
Soils: Landslide hazard evaluation will be used to assess potential mass wasting risk by the project. The Rogue River National Forest landside, slope stability and hazard rating maps will be used to determine need for detailed slope stability mapping.	P	P, R	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 3.4.3 EIS Sec. 4.1.2.2 POD Att. I
Soils: Design management activities to retain effective ground cover The mineral soil exposure should not exceed the following limits overall, based on the erosion hazard rating of the soil type, as defined In the Rogue River National Forest Soil Resource Inventory. a. Forty percent mineral soil exposed on soils classed as very slight, slight, low or moderate erosion hazard soil; b. Thirty percent exposure on high or severe erosion hazard soils; c. Fifteen percent exposure on very high or very severe erosion hazard soils.	P	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 POD Att. I
Soils: Rehabilitate adversely impacted sties.	P, R	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 POD Att. I

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Facilities: The Access Management Objectives Process, as described In Forest Service Handbook 7709.55, will be used to develop Road Design, Road Operation, Road Maintenance, and Off-Road Travel Criteria. These in turn will be used to develop: a. Road and Trail Design Elements, b. Road and Trawl Design Standards, c. Road Maintenance Levels, d. Road and Trail Maintenance Plans, e. Road Traffic Management Strategies, f. Road Restriction Orders and Traffic Control Devices, g. Off-Road Vehicle Management Strategies, h. Travel Maps and i. Closure Orders.			
Facilities: Within sensitive soil resource Inventory land types as shown m Management Strategy 21, the following guidelines apply. a. Geotechnical Input is required for road location, design, and management; b. Temporary roads will be planned, located, surveyed, designed, constructed and operated utilizing the same procedures for reviewing decisions, selecting design elements and standards, and controlling construction, operation, and maintenance as are used for permanent transportation system roads; and c. Roads which access or traverse these land types may be closed seasonally to prevent resource damage.	N		
Facilities: Temporary roads that have been evaluated through the NEPA process are permitted.	N		
Facilities: Roads that are no longer needed shall be obliterated and properly drained when they are taken out of service Vegetation shall be reestablished within one year.	N		
Protection: Plan pest control alternatives to be biologically selective, cost beneficial and to have no irreversible adverse effect on the environment.	N		
Protection: Provide a low level of prevention activities limited primarily to public contact through patrol and fire prevention signing at campgrounds, rest areas, main access road junctions and information centers.	N		
Protection: Use prescription fire to obtain desired ecological characteristics of the area	N		
Protection: Treat activity fuels to a level which meets protection standards and resource objectives in a cost-efficient manner.	N		
Protection: Conduct prescribed burning in such a manner that it will conform to applicable provisions of the Federal Clean Air Act, Oregon Smoke Management Plan and the Rogue River National Forest Smoke Management Plan.	N		
Protection: Each wildfire will have an appropriate response m accordance with the Rogue Rover National Forest Fire Management Pokey and Plan.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Backcountry Non-Motorized 03			
Not Applicable, Excluded From Table			
Developed Recreation 04			
Recreation - Roaded Natural: Provide recreation developments at levels two through five (see Glossary for definitions).	N		
Recreation - Roaded Natural: Manage the area for Modification Visual Quality Objective.	N		
Recreation - Roaded Natural: Rehabilitate deteriorated recreation use areas.	N		
Recreation - Roaded Natural: Utilize private enterprise and other public agencies to manage National Forest recreation sites if warranted for efficient operation.	N		
Recreation - Roaded Natural: Prohibit hunting in this area.	N		
Recreation - Roaded Natural: Construct and operate facilities and sites to protect capital investments and public health and safety.	N		
Recreation - Roaded Natural: Off-road vehicles and standard vehicles shall only be permitted on the roads or trails not closed to such use.	N		
Recreation - Roaded Natural: Use fertilizer and seeding to maintain and enhance recreation sites or trails not closed to motorized use.	N		
Recreation - Roaded Natural: Recreation residences will not exceed the present level.	N		
Recreation - Roaded Natural: Assess the impacts to visual resources in all project environmental analysis. Analyze visual values in terms of degradation, maintenance or enhancement.	N		
Recreation - Roaded Natural: Identify the potential effect of any proposed activity on recreation opportunity spectrum classes In all project environmental analysts.	N		
Recreation - Roaded Natural: Investigate area to inventory archaeological, historical or other cultural resource properties which may be located within the proposed 'area of effect' of projects or elsewhere Document results of the investigation/Inventory in the project environmental analysis Inventory of non-project areas will be guided by the Forest's cultural resource inventory strategy.			
Recreation - Roaded Natural: Evaluate the cultural resources found within the area using a qualified cultural resource specialist to determine their potential archaeological, historical or cultural significance Evaluate cultural resources on a project-specific basis or by thematic/multi-resource group If a cultural resource is discovered after project activity has begun, the activity will cease or be modified until an evaluation of significance can be made.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Recreation - Roaded Natural: Assess the Impacts of a proposed action to determine the effect of the project upon potentially or known significant cultural resources.	N		
Recreation - Roaded Natural: Mitigate potential adverse Impacts to significant cultural resources by redesigning the project to avoid damage or disturbance, or implementing appropriate mitigation procedures to reduce the adverse impact to the resource.	N		
Recreation - Roaded Natural: Inventory and protect cultural resources to Insure that values are not damaged or destroyed until they can be evaluated for scientific study, interpretation or other appropriate uses Protection of values may include maintenance of structures, avoidance of the site, or scientific removal, analysis and reporting.	N		
Recreation - Roaded Natural: Evaluate and enhance cultural resources for scientific, educational, recreational and ethnic use to the extent the Integrity of the resource is maintained Use will be carefully monitored.	N		
Recreation - Roaded Natural: Develop and administer schedules for long-range cultural resource management Coordinate cultural resource management with appropriate State and Federal agencies.	N		
Recreation - Roaded Natural: Properties that meet the significance criteria will be treated as eligible to the National Register of Historic Places; eligible properties will be nominated to the National Register.	N		
Wilderness: This element is not applicable under an intensive recreation management strategy.	N		
Wilderness: Project plans will assure that wilderness boundaries are not violated.	N		
Wildlife, Fish and Plants: Emphasis will be on habitat improvement for watchable wildlife and maintaining or improving fish habitat. If significant changes in recreation use are planned because of changes in facilities or access, this will be coordinated with the State's Departments of Fish and Wildlife.	P, R	P,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.5.2.3 & 4.5.2.4 EIS Sec. 4.8.1.3 EIS App. F.2 POD Att. S POD Att. DD
Wildlife, Fish and Plants: Permit wildlife and fish projects that do not conflict with recreation management activities and recreation resource values.	P, R	P,	EIS Sec. 2.1.4 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.5.2.3 & 4.5.2.4 EIS Sec. 4.8.1.3 EIS App. F.2 POD Att. S POD Att. DD

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Endangered, threatened and sensitive species (and species proposed for Federal listing by USDA Fish and Wildlife Service [PETS]) will be identified and managed in cooperation with the USDI Fish and Wildlife Service, Oregon Department of Fish and Wildlife, Oregon Department of Agriculture, Oregon Natural Heritage Database, and California Department of Fish and Game.	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 EIS App. F.4 POD Att. J POD Att. DD
Wildlife, Fish and Plants: Legal and biological requirements for the conservation of listed and proposed endangered, threatened and sensitive plant and animal species shall be met. Habitat for existing federally-listed species shall be managed to achieve objectives of recovery plans.	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 EIS App. F.4 POD Att. J POD Att. DD
Wildlife, Fish and Plants: Biological evaluations (FSM 2672.4) shall be prepared for each project authorized, funded or conducted on the Forest. The biological evaluation shall be used to determine the possible effects the proposed activity will have on listed and PETS species. The biological evaluation consists of five steps. a. Pre-field review of existing information; b. Field reconnaissance of the project area, c. Determination of whether local populations of listed and PETS species will be affected by a project; d. Analysis of the significance of project effects on local and total populations of listed and PETS species, e. When step four cannot be completed due to lack of information, a biological or botanical investigation is conducted to gather the information needed to complete step four.	P, R	P,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 EIS App. F.4 POD Att. J POD Att. DD
Wildlife, Fish and Plants: If endangered, threatened or proposed species are found in a project area, consultation requirements with the USDI Fish and Wildlife Service shall be met in accordance with the Endangered Species Act (Public Law 93-205) and FSM 2671.4 No adverse Impacts on endangered, threatened or proposed species or their habitats shall occur except when It is possible to compensate adverse effects totally through alternatives identified in a biological opinion rendered by the USDI Fish and Wildlife Service (FSM 2670.31) Before a project can be carried out, protection or mitigation requirements shall be specified (NFMA, 36 CFR 219.27(a)(8)).	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 EIS App. F.4POD Att. J POD Att. L POD Att. DD
Wildlife, Fish and Plants: If sensitive species are found in a project area, avoidance or other mitigation to minimize Impacts to local populations shall be used for those species whose viability has been identified as a concern (FSM 2670.32) Maintaining viable populations of species throughout their geographic range (FSM 2670.22) shall be an objective during project planning. At a minimum, no action shall result in loss of species viability or create significant trends toward Federal listing (FSM 2670.32).	P, C, R, O	P, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Sec. 3.4.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 EIS App. F.4 POD Att. J POD Att. DD

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Osprey - Protect active nests during the nesting season. Land management activities having adverse potential impact should not occur within a 20-chain radius of the nest from March 1 to August 31. Nest and perch trees will be protected until they are no longer usable.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Resident Trout and Steelhead – Water quality law establishes a level of aquatic resource management that will maintain the Forest's fisheries habitat at a level capable of sustaining or exceeding minimum viable populations for the various species of anadromous and resident fish. Cold water production for both on and off Forest fish needs is identified as a principal objective for the Forest's streams. Maintain existing fish habitat capability and develop fish habitat improvement projects to fully utilize potential smolt production capability of Forest anadromous streams and resident fish in other streams and lakes Coordinate land management activities with the California Department of Fish and Game and Oregon Department of Fish and Wildlife objectives Natural debris, plus trees needed for a future supply, will be maintained and managed to 1) enhance stream channel and bank structure so as to protect water quality, and 2) provide structural fish habitat to meet the objectives of small habitat capability or resident fish populations provided for in the Forest Plan.	P, C, R, O	P, B,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Sec. 4.7.3.5 EIS Secs. 4.5.2.3 & 4.5.2.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 EIS App. F.4 POD Att. DD
Wildlife, Fish and Plants: Bald Eagle - Develop a bald eagle sate management plan for each nesting or roosting area as it is discovered Until a site specific management plan is developed, the following measures will apply Establish the primary nesting zone to be a 330 foot radius around the nest and the secondary zone to be a 660foot radius around the nest. The following activities should not occur within the nesting zones and communal roosting sates 1) Primary Zone _ All human related activities unless the activities pre-existed to nest discovery and the eagles are apparently tolerant; 2) Secondary Zone - Major land uses such as development of commercial and industrial sites, home, road, powerline or other construction, oil drilling, surface mining, and spraying of chemicals which adversely affect eagles, Timber cutting to enhance habitat is permitted but there is no scheduled timber harvest; 3) Primary and Secondary Zones between January 1 and August 15 - blasting, use of firearms, camping, picnicking. timber harvest, road and water access into the nesting territory, and low level aircraft operations with helicopters no closer than 1,000 feet and with fixed wing no closer than 500 feet, 4) A communal roost is any stand of trees in which eagles regularly roost together. The primary zone for roosting eagles is 330 feet from the roosting trees and the secondary zone is one-quarter of a mile from the roosting trees Large trees used as solitary roosts should be left along shoreline of lakes and streams wherever possible.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Peregrine Falcon - Develop a Peregrine falcon site management plan for each nesting area found. The site plan design will be tailored to fit the landscape and the use patterns established by the bards The following may be included in the Plan. 1) Delineate the nest site (eyrie); 2) Define primary (nesting) and secondary and tertiary zones associated with the eyrie; 3) Withdraw the nest sate from mineral entry, 4) Restrict management activities and recreational use to September through January, 5) Allow no structural developments within the primary zone unless it benefits the species; 6) Maintain and/or enhance riparian habitats within a three-mile radius of the eyrie; 7) Develop water sources (springs, seeps, ponds, catchments) within approximately one-half mile radius of the eyrie. 8) Implement silvicultural prescriptions, prescribed fire or other management techniques to maintain a mosaic of all vegetative serial stages within the secondary and tertiary zones (approximately a three-mile radius of the eyrie); 9) Direct special emphasis towards maintaining and/or enhancing mast- and berry-producing shrubs and trees which support jays, bandtail pigeon and other passerine bards. Biological evaluation and informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7
Range: Where these lands fall within grazing allotment boundaries, portions with heavy use and development will be excluded from the allotment or classified as unusable range.	N		
Range: Developed recreation areas adjacent to rangelands will have livestock control, mainly fences or natural barriers to restrict livestock.	N		
Range: Small pasture allotments for individually owned recreation stock will not be allowed in this management area.	N		
Range: Write range allotment plans to reflect management direction for all lands within the allotment boundary. Allotment planning procedures are documented in FSM 2210.	N		
Range: Develop Coordinated Resource Management Plans where possible and feasible to facilitate the integrated resource management of range and other resources, and between agencies, permittees and other landowners.	N		
Timber: Timber will be managed on a nonscheduled basis to meet recreation objectives. Objectives will be to: a. Reduce risk of public injury from hazardous frees and vegetation. b. Maintain or improve visual quality associated with the recreational experience of the area. c. Salvage and prevent catastrophic destruction of the vegetative cover (insects, diseases, fire, wind).	N		
Timber: Tractor logging will be done in a way, such as skidding over the snow, that prevents injuries to root systems and the spread of disease.	N		
Timber: Fuelwood gathering will normally be limited to cleaning up management activities.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Timber: Manage vegetation on recreation sites, except for ski areas and snow play areas, to meet the following objectives: a. Understory screening with emphasis on broad leaf species. b. Multi-layered canopies c. Provide shade on approximately 60 percent of the area. d. Maintain a healthy, vigorous stand. e. Maintain clumpy, irregular spacing. f. Maintain or create a natural looking stand.	N		
Timber: Manage vegetation on ski and snow play areas to meet the needs of the activities while being compatible with other resource values.	N		
Timber: Rehabilitate and reconstruct developments and resources that have been impacted by timber sale activities.	N		
Timber: All silvicultural prescriptions will be approved by a certified silviculturalist and reviewed by the Distinct Ranger.	N		
Timber: The logging system design for timber sales will be reviewed by logging systems specialists designated by the Forest Supervisor Reviewer for feasibility, silvicultural compatibility and economics.	N		
Timber: All silvicultural prescriptions and logging plans will be reviewed by a landscape architect for feasibility, silvicultural compatibility and the ability to meet developed recreation objectives.	N		
Timber: Utilization standards for timber harvested will meet the standards as stated In the Pacific Northwest Regional Guide, Standards and Guidelines 4-2 and m Table 3-6 Standards m timber sale contracts may vary depending on markets and costs of harvesting.	N		
Timber: In seed collections, no seed lot shall be represented by fewer than 15 families of trees from that species, well distributed across the breeding zone In addition, no family of parent trees shall represent greater than 20 percent of a seed lot Although any given plantation may be planted to a single species, strive for a natural seed source from a variety of species.	N		
Water: Evaluate effects of proposed projects on stream courses. In all environmental analysis discuss pertinent stream classification and recommend changes where appropriate as a result of the environmental analysis.	P	P	EIS Sec. 2.4.2.2 EIS Sec. 4.3.2.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.7.3.5 EIS App. F.4 POD Att. I POD Att. 28

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Water: Comply with State requirements in accordance with the Clean Water Act of 1972, as amended (1977 and 1987) for protection of waters of the State of Oregon (Oregon Administrative Rules, Chapter 340-41), and the State of California (Porter-Cologne Water Quality Control Act, Division 7) through planning, application, and monitoring of Best Management Practices (BMPs) in conformance with the Clean Water Act of 1972, as amended (1977 and 1987), regulations, and federal guidance issued thereto.	P, C, R, O	P, B	EIS Secs. 1.4 EIS Sec. 1.5 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.7.1 & 2.7.2 EIS Secs. 4.3.2.2 & 4.3.3.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.7.3.5 EIS App. F.4 POD Att. I POD Att. M POD Att. BB
Water: In cooperation with the States of Oregon and California, the Forest will use the following process. a. Select and design BMPs based on site specific conditions, technical, economic, and institutional feasibility, and water quality standards for those waters potentially impacted, b. Implement and enforce BMPs; c. Monitor to insure that practices are correctly applied as designed: d. Monitor to determent the effectiveness of practices in meeting design expectations and in attaining water quality standards: e. Evaluate monitoring results and mitigate where necessary to minimize impacts from activities where BMPs do not perform as expected: f. Adjust BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level Evaluate the appropriateness of water quaky criteria for reasonably assuming protection of beneficial uses. Consider recommending adjustment of water quality standards, g. Use the existing agreed to process to Implement the State Water Quality Management Plan on lands administered by the USFS as described In Memorandums of Understanding between. 1) the Oregon Department of Environmental Quality and US. Department of Agriculture, Forest Service (Z/12/79 and 12/7/82), and “Attachments A and 8’ referred to In this MOU (Implementation Plan for Water Quality Planning on National Forest lands in the Pacific Northwest 12/78 and Best Management Practices for Range and Grazing Activities on Federal lands) and 2) the State Water Resources Control Board, State of California, and U.S. Department of Agriculture Forest Service, Pacific Southwest Region, 1981.	P, C, R, O	P, B	EIS Sec. 1.5 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.7.1 & 2.7.2 EIS Secs. 4.3.2.2 & 4.3.3.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.7.3.5 EIS App. F.4 POD Att. I POD Att. M POD Att. CC
Water: The following requirements will be employed in protect implementation when proposed projects may affect streams. Determine restricted distance from streams for equipment operation, type of stream crossing, if crossing is needed, and erosion control methods, I needed.	P	P, B, R	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.3.1.2, 4.3.2.2 & 4.3.3.2 POD Att. I POD Att. W POD Att. X POD Att. BB

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Water: The following requirements will be employed in project implementation when proposed projects may affect streams. Consider relation of project to riparian strategy areas (all streams classed as I, II and III are allocated to Strategy 26);	P, R	P, R, ,	EIS Sec. 2.1.4 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS App. F.4 POD Att. DD
Water: The following requirements will be employed in project implementation when proposed projects may affect streams. Locate springs that may be affected and evaluate for appropriate levels of protection. This would usually require consultation with soil, water or geology specialists.	P	P, B, R	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.7.2 EIS Sec. 4.1.2.5 EIS Sec. 4.3.1.2 POD Att. C3 POD Att. I
Water: The following requirements will be employed in project implementation when proposed projects may affect streams. In project planning, consider basin constraint percentages by subwatershed as identified in the monitoring plan for watersheds.	P	P, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 4.7.3.5 EIS App. F.4
Water: Acquire water rights for development of non-reserved uses.	N		
Water: Design project water monitoring as appropriate.	P	P, B	EIS Secs. 2.3.2.1 & 2.1.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.7.1 & 2.7.2 POD Att. I POD Att. M POD Att. CC
Water: Allow for watershed restoration projects.	P, R	P,	EIS Sec. 2.1.4 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. DD
Water: In-stream flows on National Forest lands should be protected through critical analysis of proposed water uses, diversion and transmission applications and renewal of permits.	N		
Water: Insure that proposed projects have no adverse effects on snow survey sates included in the Regional Forester's memorandum of understanding with the Soil Conservation Service.	N		
Water: Comply with the specific direction for management of each of the municipal watersheds as specified in management agreements between the U.S. Department of Agriculture or Forest and municipalities.	N		
Minerals: Areas not already withdrawn will be recommended for withdrawal from mineral entry.	N		
Minerals: Prohibit aggregate source development.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Minerals: Under mining laws, claimants are entitled to access to their mining claims Access for exploration and development of locatable mineral resources will be analyzed in response to a proposed operating plan A decision on approval of reasonable access will be made as a result of appropriate environmental analyses.	N		
Minerals: Operating plans for mining operations will be processed In a timely manner in accordance with 36 CFR 228.	N		
Minerals: In plans of operation, require operationally feasible provisions designed to' protect riparian and fishery values, meet State water quality standards: and Insure that disturbed areas are reclaimed Insofar as practicable to a practicable condition.	N		
Minerals: Reclamation plans will Identify management objectives for disturbed areas and detail the procedures and time frames necessary to accomplish the objectives Reclamation bonds will be based on actual reclamation costs and formulated using technical and other resource Input.	N		
Human And Community Development: Conduct compliance reviews as required by Title VI of the Civil Rights Act of 1964, and established Forest Service standards.	N		
Human And Community Development: Inform the general public, including minorities and the underprivileged. of availability and benefits which they are eligible to receive from Forest programs. Techniques to Increase awareness and participation will be used.	N		
Human And Community Development: As directed by the American Indian Religious Freedom Act, the Forest will protect and preserve for Native Americans their inherent right of freedom to believe, express and exercise their traditional religions on Forest lands This includes, but is not limited to, access to ceremonial sites, use and possession of sacred objects, and the freedom to worship through traditional ceremonies and rites.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities compatible with interests of surrounding Indian tribes.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities with the Interest of adjacent communities.	N		
Human And Community Development: Consider the needs of the handicapped in the design of facilities.	N		
Human And Community Development: Maintain and promote the HOST program.	N		
Human And Community Development: Promote volunteer programs.	N		
Lands: Mark area boundaries.	P, C, O, R	P, B	EIS Sec. 2.4.2.1 POD Att. U POD Att. T

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Lands: Revise all special use permits to be constant with the direction in this management strategy when renewed.	N		
Lands: Direct applications for electronic sites toward use of sites In the following order. a. Utilizing residual capacity of existing sites b. Developing new sites identified in the Forest-wide Electronic Site Plan	N		
Soils: Address the potential for detrimental soil displacement, compaction, puddling, severe burning, mass wasting and surface soil erosion in project environmental analysis.	N		
Soils: Alternative management practices will be developed or mitigation measures planned and implemented when activities are likely to result In detrimental displacement, compaction, mass wasting or erosion.	N		
Soils: Landslide hazard evaluation will be used to assess potential mass wasting risk by the project. The Rogue River National Forest landslide, slope stability and hazard rating maps will be used to determine need for detailed slope stability mapping.	N		
Soils: Rehabilitate adversely impacted sites.	N		
Facilities: The Access Management Objectives Process, as described in Forest Service Handbook 7709.55, will be used to develop Road Design, Road Operation, Road Maintenance, and Off-Road Travel Criteria These in turn will be used to develop. a. Road and Trail Design Elements, b. Road and Trawl Design Standards, c. Road Maintenance Levels, d. Road and Trawl Maintenance Plans, e. Road Traffic Management Strategies, f. Road Restriction Orders and Traffic Control Devices, g. Off-Road Vehicle Management Strategies, h. Travel Maps and i. Closure Orders	N		
Facilities: Water, sewer, and electrical systems are necessary for many facilities provided. This infrastructure shall be constructed and maintained to provide safe service without detracting from the experience provided at the site.	N		
Facilities: Signing is necessary to provide user information and safe use of sites. The following guidelines apply: a. Traffic signing shall meet applicable standards to provide for safe use by intended vehicles during inclement weather and hours of darkness. Where allowable under those standards, standards, pavement markings will be used in lieu of signs. b. Informational and interpretive signing shall be constructed as necessary to facilitate use of sites.	N		
Facilities: Temporary roads that have been evaluated through the NEPA process are permitted.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Facilities: Roads that are no longer needed shall be obliterated and properly drained when they are taken out of service.	N		
Facilities: When new facilities are constructed and when existing facilities are substantially reconstructed, provisions shall be made for use by the physically handicapped.	N		
Facilities: Vegetation shall be established on substantial areas of disturbed ground within one year of completion of construction or other ground disturbing activities.	N		
Protection: Plan pest control alternatives to be biologically selective, cost beneficial and to have no irreversible adverse effect on the environment.	N		
Protection: Suppress pest outbreaks with a minimum of disturbance to protect developments and/or users. Favor biological and silvicultural treatments where possible.	N		
Protection: Utilize integrated Pest Management strategies to prevent unacceptable losses. Monitor trees in developed sites for hazard to facilities and users. Remove hazard trees.	N		
Protection: Provide a high level of fire prevention activities consisting of public contact through the use of media, including the use of low watt AM radio stations providing information emphasizing fire prevention as a part of the overall message. High visibility prevention activities include signing and personal public contact at all campgrounds and dispersed recreation areas, rest areas, main road junctions, heavily used public access points, information centers and local businesses.	N		
Protection: Treat activity fuels to a level which meets protection standards and resource objectives in a cost-efficient manner.	N		
Protection: Prescribed fire may be used to reduce hazardous fuel concentrations at the periphery of the site and to form fuelbreaks adjacent to high use, high fire occurrence areas. Burning will be planned so as to have a minimum impact on use of the recreation opportunities in the area.	N		
Protection: Design hazard reduction activities so that they are compatible with management strategy objectives.	N		
Protection: Slash disposal and other post-sale cleanup activities will be completed in cuffing areas prior to the beginning of the next recreation season. Some slash may be left for firewood for recreational use.	N		
Protection: Conduct prescribed burning in such a manner that It will conform to applicable provisions of the Federal Clean Air Act, Oregon Smoke Management Plan and the Rogue River National Forest Smoke Management Plan.	N		
Protection: Each wildfire will have an appropriate response in accordance with the Rogue River National Forest Fire Management Policy and Plan.	N		
Protection: Recreation sites may be used as fire camps. However, fire camp activities shall not cause site damage. Appoint a resource specialist to advise the Incident Commander and/or Logistics Section Chief on the best use of the site.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Special Interest Areas 05			
Not Applicable, Excluded From Table			
Foreground Retention 06			
Recreation - Roaded Natural: Manage the area for Retention Visual Quality Objective. Catastrophic occurrences may dictate a need for short term departure from Retention. Assess the impacts to visual resources in all project environmental analysis. Specifically address how the visual quality objective will be met.	P, C, O, R	P, B, R, A	EIS Sec. 2.1.3.4 EIS Sec. 2.4.2.1 EIS Sec. 4.7.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. A POD Att. I POD Att. S LRMP Amendment RRNF-2
Recreation - Roaded Natural: Design management activities to meet visual quality objective when viewed from travel routes and critical viewpoints.	P	P, B, R,	EIS Sec. 2.4.2.1 EIS Sec. 4.7.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. A POD Att. I POD Att. S
Recreation - Roaded Natural: Design all projects with assistance of a landscape architect.	P, R	P, R, ,	EIS Sec. 2.1.4 EIS Sec. 4.7.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 EIS App. F.8 EIS App. K POD Att. A POD Att. DD
Recreation - Roaded Natural: Correct unacceptable form, line, color or texture as a result of management activities either during the operation or within one year after completion of the activity.	P, R	P, B,	EIS Sec. 2.4.2.1 EIS Sec. 4.7.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. A POD Att. I POD Att. SL
Recreation - Roaded Natural: Rehabilitate deteriorated recreation use areas.	N		
Recreation - Roaded Natural: Provide for dispersed recreation activities such as hunting, fishing, gathering of forest products and scenic driving.	N		
Recreation - Roaded Natural: Manage trails and dispersed occupancy sites in a manner not in conflict with visual resource values.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Recreation - Roaded Natural: Identify the potential effect of any proposed activity on recreation opportunity spectrum classes in all protect environmental analysis.	P, R	P, B,	EIS Sec. 2.4.2.1 EIS Sec. 4.7.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. A POD Att. I POD Att. S
Recreation - Roaded Natural: Off-road vehicle use is permitted if evidence of use meets the visual quality objective. When this activity begins to adversely impact the visual qualities of these areas, restrictions will be imposed on off-road vehicle activities. These restrictions may include prohibition on types of equipment used, seasonal closures or total closures.	N		
Recreation - Roaded Natural: View shed plans will be prepared to provide project level direction for implementing the Forest Plan.	N		
Recreation - Roaded Natural: Protect Special Dispersed Features, including trails, from adverse impacts until management of the special dispersed feature is addressed in an environmental analysis.	N		
Recreation - Roaded Natural: Investigate area to inventory archaeological, historical or other cultural resource properties which may be located within the proposed "area of effect" of projects or elsewhere Document results of the investigation/ inventory in the protect environmental analysts Inventory of non-project areas will be guarded by the Forest's cultural resource Inventory strategy.	N		
Recreation - Roaded Natural: Evaluate the cultural resources found within the area using a qualified cultural resource specialist to determine their potential archaeological, historical or cultural significance Evaluate cultural resources on a project-specific basis or by thematic/multi-resource group If a cultural resource is discovered after project activity has begun, the activity will cease or be modified until an evaluation of significance can be made.	N		
Recreation - Roaded Natural: Assess the Impacts of a proposed action to determine the effect of the project upon potentially or known significant cultural resources.	N		
Recreation - Roaded Natural: Mitigate potential adverse Impacts to sign& cant cultural resources by redesigning the project to avoid damage or disturbance, or implementing appropriate mitigation procedures to reduce the adverse impact to the resource.	N		
Recreation - Roaded Natural: Inventory and protect cultural resources to insure that values are not damaged or destroyed until they can be evaluated for scientific study, interpretation or other appropriate uses. Protection of values may include maintenance of structures, avoidance of the site, or scientific removal, analysis and reporting.	P, C, O	P, B, R	EIS Sec. 1.5 EIS Secs. 4.11.1.1 – 4.11.1.3 EIS Secs. 4.11.3.3 EIS Secs. 4.11.4 & 4.11.5 POD Att. Z

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Recreation - Roaded Natural: Evaluate and enhance cultural resources for scientific, educational, recreational and ethnic use to the extent the Integrity of the resource is maintained Use will be carefully monitored.	N		
Recreation - Roaded Natural: Develop and administer schedules for long-range cultural resource management Coordinate cultural resource management with appropriate State and Federal agencies.	N		
Recreation - Roaded Natural: Properties that meet the significance criteria will be treated as eligible to the National Register of Historic Places; eligible properties will be nominated to the National Register.	N		
Wilderness: This element is not applicable under an intensive recreation management strategy.	N		
Wilderness: Project plans will assure that wilderness boundaries are not violated.	N		
Wildlife, Fish and Plants: Permit wildlife and fish projects that do not conflict with recreation management activities and recreation resource values.	N		
Wildlife, Fish and Plants: Endangered, threatened and sensitive species (and species proposed for Federal listing by USDA Fish and Wildlife Service [PETS]) will be identified and managed in cooperation with the USDI Fish and Wildlife Service, Oregon Department of Fish and Wildlife, Oregon Department of Agriculture, Oregon Natural Heritage Database, and California Department of Fish and Game.	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 EIS App. F.4 POD Att. J POD Att. DD
Wildlife, Fish and Plants: Legal and biological requirements for the conservation of listed and proposed endangered, threatened and sensitive plant and animal species shall be met. Habitat for existing federally-listed species shall be managed to achieve objectives of recovery plans.	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 EIS App. F.4 POD Att. J POD Att. DD

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Biological evaluations (FSM 2672.4) shall be prepared for each project authorized, funded or conducted on the Forest. The biological evaluation shall be used to determine the possible effects the proposed activity will have on listed and PETS species. The biological evaluation consists of five steps. a. Pre-field review of existing information; b. Field reconnaissance of the project area, c. Determination of whether local populations of listed and PETS species will be affected by a project; d. Analysis of the significance of project effects on local and total populations of listed and PETS species, e. When step four cannot be completed due to lack of information, a biological or botanical investigation is conducted to gather the information needed to complete step four.	P, R	P,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 EIS App. F.4 POD Att. J POD Att. DD
Wildlife, Fish and Plants: If endangered, threatened or proposed species are found in a prefect area, consultation requirements with the USDI Fish and Wildlife Service shall be met in accordance with the Endangered Species Act (Public Law 93-205) and FSM 2671.4 No adverse Impacts on endangered, threatened or proposed species or their habitats shall occur except when It is possible to compensate adverse effects totally through alternatives identified in a biological opinion rendered by the USDI Fish and Wildlife Service (FSM 2670.31) Before a project can be carried out, protection or mitigation requirements shall be specified (NFMA, 36 CFR 219.27(a)(8)).	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 EIS App. F.4 POD Att. J POD Att. L POD Att. DD
Wildlife, Fish and Plants: If sensitive species are found in a project area, avoidance or other mitigation to minimize Impacts to local populations shall be used for those species whose viability has been identified as a concern (FSM 2670.32) Maintaining viable populations of species throughout their geographic range (FSM 2670.22) shall be an objective during project planning At a minimum, no action shall result in loss of species viability or create significant trends toward Federal listing (FSM 2670.32).	P, C, R, O	P, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Sec. 3.4.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 EIS App. F.4 POD Att. J POD Att. DD
Wildlife, Fish and Plants: Northern Spotted Owl - Manage this species under the standards and guidelines established in the ROD for the Supplement to the Environmental Impact Statement for an amendment to the Pacific Northwest Regional Guide In the event that a pair of northern spotted owls are found in an area, consideration will be given to (1) the need to improve the distribution of older forest ecosystems for all associated plant and animal species, (2) providing insight Into management of spotted owl habitat areas (SOHA) through experimental habitat manipulation During the planning and scheduling phase of a timber sale or any other project activity that may Impact spotted owl habitat, conduct a biological evaluation in order to determine the degree of Impact and to provide for protective measures.	P, C, R, O	P, R, ,	EIS Secs. 1.5 EIS Sec. 2.1.4 EIS Sec. 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS Secs. 4.7.3.4 & 4.7.3.6 EIS App. F.3 EIS App. F.4 EIS App. F.7 POD Att. DD
Wildlife, Fish and Plants: Osprey - Protect active nests during the nesting season Land management activities having adverse potential impact should not occur within a 20-chain radius of the nest from March 1 to August 31 Nest and perch trees will be protected until they are no longer usable.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Wildlife, Fish and Plants: Goshawk – Nest sites will be protected from disturbing human activities during the nesting season. To maintain the physical suitability of nesting areas and prevent disturbances that may cause nesting failures, the period of protection will be from March 1 to August 31 for the area within 20 chains of the active nest.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Goshawk – Each nest site is assumed potentially active until June 1. If monitoring has shown that no nesting attempt has been initiated or that a nesting attempt has failed by June 1, the nest site will be considered inactive and the above nest site restriction may be waived Monitoring will be supervised and evaluated by a qualified wildlife biologist.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Goshawk – Goshawk nests will be protected within a 25 acre no-harvest buffer of trees unless other adjacent alternate buffers are available in a logical basis to maintain habitat over time.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Leave sufficient wildlife trees (hard snags or green trees designated to become snags) in coniferous forest lands to provide for at least 60 percent of the potential population levels for cavity nesting species The distribution of numbers and size class necessary to meet 60 percent per 100 acres is as follows: Siskiyou and Cascade Mixed Conifer Size Number 15+ 179 17+ 36 25+ 3 Total 218 Siskiyou and Cascade True Fir Size Number 15+ 143 17+ 11 25+ 3 Total 157	P, C, R, O	P, R,	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 EIS App. F.2 POD Att. P POD Att. U POD Att. DD

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Species distribution should be representative of the site's original stand. Trees selected for retention should maximize use of the stands cull component. If the proper number and size of trees do not exist in the stand to be treated, select the proper number from the next lower size class (i.e., if 25" trees are not available go to 17" trees) Material that satisfies the need for down woody material recruitment will come from existing down material, down woody material that is the result of a silvicultural treatment and from the trees that are designated to meet standing wildlife tree requirements. The long-term goal for large woody material (LWM) is 10 to 20 pieces of class I and II logs per acre, and all existing class III, IV and V logs except for incidental amounts removed during management activities Additional green merchantable trees will not be designated unless none of the other categories exist The expected life span of snags or dead trees in mixed conifer working groups is 30 years and in true for working groups the life span is 20 years The silvicultural prescription will describe the total number, size and species of wildlife trees that will be required through the next full rotation of the stand being treated Wildlife and down woody material requirement will be included as part of the vegetative (silvicultural) prescription for each stand information for the prescription will be provided by a wildlife biologist based on site by site needs A certified silviculturist will validate the data and include It in the preparation of the final vegetative (silvicultural) prescription that implements all the interdisciplinary requirements The logging system required, reforestation needs, slash disposal requirements and site preparation needs should be compatible with the wildlife tree distribution needs. Primary cavity excavator habitat will be met on areas no larger than 60 acres Including adjacent harvest units The Intent being to provide well distributed habitat and allow adjacent stands to provide the needed wildlife trees for past harvest units where the adjacent stands plus harvest units do not exceed 60 acres Where past harvest units were very large, the adjacent stands within 900 feet would be managed at higher wildlife tree levels to bring the overall area to the 40 percent level When the past harvest units were of such magnitude that the above methods cannot bring the entire area to the 40 percent level, the remaining shortage will not be provided for, but will be recorded and tracked for purposes of monitoring the forest plan Selection of wildlife trees to make up for past deficits will meet the same selection criteria as in newly treated stands Green merchantable trees will not be girdled to create wildlife snags, regardless of the situation, until (5-7) years after project completion (sale closure), in order to capture any mortality that may occur during that time Operational accomplishment will be Included as a monitoring item in the forest plan.	P, C, O, R	P, B,	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 POD Att. P POD Att. U POD Att. DD
Wildlife, Fish and Plants: Deer and Elk - Maintain summer range to provide hiding and thermal cover Timber harvesting and/or thinning should provide hiding and thermal cover between treatment areas and roads with continuous vehicle use Hiding cover should be dense enough to hide 90 percent of a deer or elk from view at 200 feet Hiding cover need not be continuous but gaps between screens should not exceed one quarter of a mile A restricted operating period from April 1 to June 30 may be imposed in identified deer or elk fawning or calving areas.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Bald Eagle - Develop a bald eagle site management plan for each nesting or roosting area as It is discovered Until a site specific management plan is developed, the following measures will apply Establish the primary nesting zone to be a 330 foot radius around the nest and the secondary zone to be a 660 foot radius around the nest The following activities should not occur within the nesting zones and communal roosting sates 1) Primary Zone All human related activities unless the activities pre-existed to nest discovery and the eagles are apparently tolerant, 2) Secondary Zone - Major land uses such as development of commercial and industrial sites, home, road, powerline or other construction, oil drilling, surface mining, and spraying of chemicals which adversely affect eagles. Timber cutting to enhance habitat is permitted but there is no scheduled timber harvest, 3) Primary and Secondary Zones between January 1 and August 15 - blasting, use of firearms, camping, picnicking, timber harvest, road and water access Into the nesting territory, and low level aircraft operations with helicopters no closer than 1,000 feet and with fixed wing no closer than 500 feet, 4) A communal roost is any stand of trees m which eagles regularly roost together. The primary zone for roosting eagles is 330 feet from the roosting trees and the secondary zone is one-quarter of a mile from the roosting trees. Large trees used as solitary roosts should be left along shoreline of lakes and streams wherever possible Biological evaluation and informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4
Wildlife, Fish and Plants: Peregrine Falcon - Develop a Peregrine falcon site management plan for each nesting area found The site plan design will be tailored to fit the landscape and the use patterns established by the birds. The following may be included in the Plan. 1) Delineate the nest site (eyrie), 2) Define primary (nesting) and secondary and tertiary zones associated with the eyrie, 3) Withdraw the nest site from mineral entry, 4) Restrict management activities and recreational use to September through January: 5) Allow no structural developments within the primary zone unless It benefits the species; 6) Maintain and/or enhance riparian habitats within a three-mile radius of the eyrie, 7) Develop water sources (springs, seeps, ponds, catchments) within approximately one-half mile radius of the eyrie, 8) Implement silvicultural prescriptions, prescribed fire or other management techniques to maintain a mosaic of all vegetative serial stages within the secondary and ternary zones (approximately a three-mile radius of the eyrie); 9) Direct special emphases towards maintaining and/or enhancing mast- and berry-producing shrubs and trees which support jays, bandtail pigeon and other passerine birds. Biological evaluation and Informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7
Range: Livestock grazing will be allowed.	N		

<table>
<tr><th colspan="4">TABLE 2.2-1

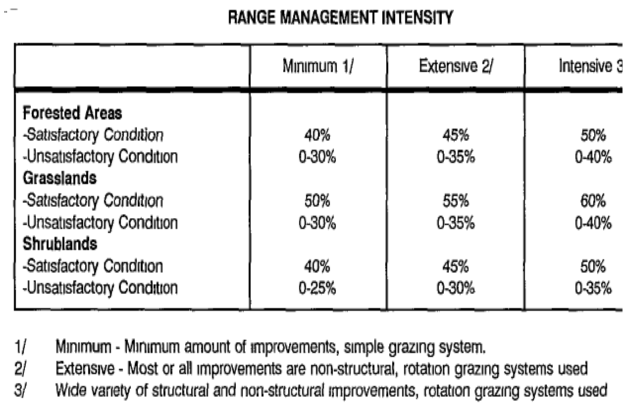
Rogue River National Forest Land and Resource Management Plan</th></tr>
<tr><th>Element</th><th>Applicable</th><th>Consistency</th><th>Comment</th></tr>
<tr><td>Range: Provide annual permittee plans for livestock distribution and use patterns Where conflicts cannot be resolved or mitigated, relocation or removal of livestock will be considered.</td><td>N</td><td></td><td></td></tr>
<tr><td>Range: Write range allotment plans to reflect management direction for all lands within the allotment boundary Allotment planning procedures are documented m FSM 2210.</td><td>N</td><td></td><td></td></tr>
<tr><td>Range: Develop Coordinated Resource Management Plans where possible and feasible to facilitate the integrated resource management of range and other resources, and between agencies, permittees and other landowners.</td><td>N</td><td></td><td></td></tr>
<tr><td>Range: Allow range Improvements that meet Retention Visual Quality Objectives.</td><td>N</td><td></td><td></td></tr>
<tr><td>Range: Allow increases in permitted grazing use to capture increases in transitory range where compatible with Foreground Retention objectives.</td><td>N</td><td></td><td></td></tr>
<tr><td>Range: Prescribe kind and amount of grass seeding in silviculture prescriptions.</td><td>N</td><td></td><td></td></tr>
<tr><td>Range: Forage utilization standards will be incorporated in allotment management plans. Allotment management plans may include utilization standards which are lower or rarely higher when associated with intensive grazing systems and specific vegetation management objectives which will meet resource management objectives and the intent of the management strategy. The standards include cumulative annual use by big game and Livestock. Utilization for grass and grass-like species is based on the percent of plant weight removed. Utilization for shrub species is based on incidence of use, weight, and/or twig length (e.g. utilization is 50 percent if 50 out of 100 leaders are browsed). Satisfactory condition is determined by allotment classification and/or forage condition. Unsatisfactory condition is anything not meeting satisfactory conditions. Allowable use of available forage (Maximum percent of annual utilization by big game and livestock) IS:</td><td>N</td><td></td><td></td></tr>
<tr><td>
RANGE MANAGEMENT INTENSITY
<table>
<tr><th></th><th>Minimum 1/</th><th>Extensive 2/</th><th>Intensive 3</th></tr>
<tr><td>Forested Areas</td><td></td><td></td><td></td></tr>
<tr><td>-Satisfactory Condition</td><td>40%</td><td>45%</td><td>50%</td></tr>
<tr><td>-Unsatisfactory Condition</td><td>0-30%</td><td>0-35%</td><td>0-40%</td></tr>
<tr><td>Grasslands</td><td></td><td></td><td></td></tr>
<tr><td>-Satisfactory Condition</td><td>50%</td><td>55%</td><td>60%</td></tr>
<tr><td>-Unsatisfactory Condition</td><td>0-30%</td><td>0-35%</td><td>0-40%</td></tr>
<tr><td>Shrublands</td><td></td><td></td><td></td></tr>
<tr><td>-Satisfactory Condition</td><td>40%</td><td>45%</td><td>50%</td></tr>
<tr><td>-Unsatisfactory Condition</td><td>0-25%</td><td>0-30%</td><td>0-35%</td></tr>
</table>
1/ Minimum - Minimum amount of improvements, simple grazing system.
2/ Extensive - Most or all improvements are non-structural, rotation grazing systems used
3/ Wide variety of structural and non-structural improvements, rotation grazing systems used</td><td>N</td><td></td><td></td></tr>
<tr><td>Timber: Timber harvest will be scheduled in thus management strategy.</td><td>N</td><td></td><td></td></tr>
</table>

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: When trees are cut for timber production objectives, the cutting shall be made in a way to assure that technology and knowledge exist to adequately restock the site within five years after final harvest (36 CFR 219 27(c)(3)).	N		
Timber: Timber harvesting shall only occur on lands classified as suitable for timber production except for salvage sales, sales necessary to protect other multiple-use values or activities that meet other objectives d the Forest Plan establishes that such actions are appropriate (36 CFR 219.27(c)(l)).	N		
Timber: Treat timber stands to achieve desired visual characteristics through the following practices. a. Sate preparation - chemical, mechanical, biological and manual; b. Tree improvement (genetics); c. Reforestation by planting Random natural seeding will count towards reaching desired stocking; d. Growing stock protection from animals, insects and diseases; e. Release and weeding - chemical, mechanical, biological and manual: f. Precommercial thinning; g. Commercial thinning, h. Salvage mortality as necessary, i. Final Harvest - even-aged silvicultural system using shelterwood, seed tree or clearcut methods The shelterwood method will probably be the most common, however, selection will be determined by the environmental assessment process and documented in a site-specific silvicultural prescription.	N		
Timber: The selection of the appropriate silvicultural system will be guarded by the following criteria: a. Must permit the production of sufficient volume of marketable trees to permit utilization of all trees which meet utilization standards and are designated for harvest. b. Must permit the use of an available and acceptable logging method. c. Must be capable of providing special conditions when required by critical soil conditions or needed to achieve management objectives. d. Must permit control of existing or potential vegetation to a degree that establishment of numbers of trees and rates of growth as identified In site-specific silvicultural prescriptions for harvest areas can be achieved. e. Must promote stand structure and species composition which avoids serious risk of damage from mammals, Insects, disease or wildfire and will allow treatment of existing Insect, disease or fuel conditions. f. Must meet resource and vegetation management objectives.	N		
Timber: Utilize uneven-aged management if specific site and vegetation characteristics lend the area to this type of management.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Timber: Manage the area for an overall mix of size classes of trees for visual as well as biological diversity. The following mix of size class types can be used as a guideline. The specific distribution will be determined in a project implementation plan. Size Class — % of Land Area 30”-36” — 30 22”-30” — 30 16”-22” — 15 9”-16” — 15 0”-9” — 10	N		
Timber: Emphasize the viewing of large diameter Douglas-fir, ponderosa pine, sugarpine or Shasta fir species. Emphasize other species where appropriate. Plan for dispersal of target trees to give the overall Character of large trees to the whole area.	N		
Timber: Design “created openings” to meet the visual quality objective. The size of a created opening could vary from less than l/4 acre in the immediate foreground (generally within 200 feet of a travel route) to 3 acres in the distant foreground. The size of created openings adjacent to trails generally will be much less than this.	N		
Timber: The timber harvested area will no longer be considered a created opening for visual purposes when trees are 20 feet in height.	N		
Timber: Provide a variety of views into the forest and the adjacent landscape. Provide irregular shaped openings to create the overall impression of an undisturbed landscape. Emphasize a mix of deciduous shrub and ground cover species such as dogwood or vine maple.	N		
Timber: As a guideline, no more than 3.3 percent of the viewed area per decade, or 6.6 percent at any one time, will be in a created opening condition.	N		
Timber: Permit created openings along a route of not more than 600 ft. per mile and not more than 300 feet continuously.	N		
Timber: Utilize irregular spacing when thinning.	N		
Timber: Create irregular patterns with plantings with a blend of tree species, approximating natural stands In seed collections no seed lot shall be represented by fewer than 15 families of trees of that species, well distributed across the breeding zone In addition, no family of parent trees shall represent greater than 20 percent of a seed lot Although any given plantation may be planted to a single species, strive for a natural seed source from a variety of species.	N		
Timber: Emphasize a high edge per acre ratio on all even-aged units.	N		
Timber: Make miscellaneous forest products such as poles, posts, boughs, Christmas trees, house logs, etc., available on an as needed basis consistent with the resource objectives of this management area.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Provide access to potential fuelwood when appropriate Bring fuelwood to convenient points in timber sale or thinning areas Utilize appropriate timber sale clauses or modify fuels management prescriptions to meet this objective.	N		
Timber: Allow commercial fuelwood contracts for slash disposal, thinning and site preparation.	N		
Timber: Open slash areas to fuelwood gathering prior to traditional disposal methods.	N		
Timber: Leave slash as a fuelwood source where there is no conflict with resource activity.	N		
Timber: Consider using the fuelwood program as a means to meet silvicultural objectives in appropriate areas, such as low productivity stands or other stands prior to reaching commercial size.	N		
Timber: Consider the season of year and access when implementing a fuelwood program. The public will be encouraged to burn dry wood.	N		
Timber: Document fuelwood availability for public uses in project environmental analysis.	N		
Timber: Be responsive to the needs of the public for fuelwood.	N		
Timber: Create a Forest fuelwood and miscellaneous products policy to include fuelwood Inventory.	N		
Timber: Stumps visible from and within 200 feet of critical travel routes or viewpoints will be a maximum height of 12 inches on the high side of the stump.	N		
Timber: Rehabilitate and reconstruct developments and resources that have been Impacted by timber sale activities.	N		
Timber: All silvicultural prescriptions will be approved by a certified silviculturalist and reviewed by the District Ranger and Landscape Architect.	N		
Timber: Reforestation, precommercial thinning and release to meet recommended stocking will be addressed with sate specific silvicultural prescriptions.	N		
Timber: The logging system design for timber sales will be reviewed by logging systems specialists and landscape architect Review for feasibility, silviculture compatibility and economics.	N		
Timber: Utilization standards for timber harvested will meet the standards as stated in the Pacific Northwest Regional Guide, Standards and Guidelines 4-2 and in Table 3-6. Standards in timber sale contracts may vary depending on markets and costs of harvesting.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

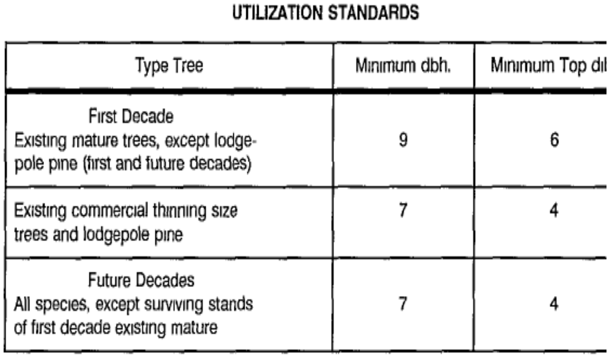
<table>
<tr><th>Element</th><th>Applicable</th><th>Consistency</th><th>Comment</th></tr>
<tr><td>
UTILIZATION STANDARDS
<table>
<tr><th>Type Tree</th><th>Minimum dbh.</th><th>Minimum Top di</th></tr>
<tr><td>First Decade
Existing mature trees, except lodgepole pine (first and future decades)</td><td>9</td><td>6</td></tr>
<tr><td>Existing commercial thinning size trees and lodgepole pine</td><td>7</td><td>4</td></tr>
<tr><td>Future Decades
All species, except surviving stands of first decade existing mature</td><td>7</td><td>4</td></tr>
</table></td><td>N</td><td></td><td></td></tr>
<tr><td><u>Water:</u> Evaluate effects of proposed projects on stream courses In all environmental analysis discuss pertinent stream classification and recommend changes where appropriate as a result of the environmental analysis.</td><td>P</td><td>P</td><td>EIS Sec. 2.4.2.2
EIS Sec. 4.3.2.2
EIS Secs. 4.3.4.1 & 4.3.4.3
EIS Sec. 4.7.3.5
EIS App. F.4
POD Att. I
POD Att. CC</td></tr>
<tr><td><u>Water:</u> Comply with State requirements in accordance with the Clean Water Act of 1972, as amended (1977 and 1987) for protection of waters of the State of Oregon (Oregon Administrative Rules, Chapter 340-41), and the State of California (Porter-Cologne Water Quality Control Act, Division 7) through planning, application, and monitoring of Best Management Practices (BMPs) in conformance with the Clean Water Act of 1972, as amended (1977 and 1987), regulations, and federal guidance issued thereto.</td><td>P, C, R, O</td><td>P, B</td><td>EIS Secs. 1.4
EIS Sec. 1.5
EIS Secs. 2.4.2.1 & 2.4.2.2
EIS Secs. 2.7.1 & 2.7.2
EIS Secs. 4.3.2.2 & 4.3.3.2
EIS Secs. 4.3.4.1 & 4.3.4.3
EIS Sec. 4.7.3.5
EIS App. F.4
POD Att. I
POD Att. M
POD Att. BB</td></tr>
</table>

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Water: In cooperation with the States of Oregon and California, the Forest will use the following process. a. Select and design BMPs based on site specific conditions, technical, economic, and institutional feasibility, and water quality standards for those waters potentially impacted, b. Implement and enforce BMPs; c. Monitor to insure that practices are correctly applied as designed: d. Monitor to determent the effectiveness of practices in meeting design expectations and in attaining water quality standards: e. Evaluate monitoring results and mitigate where necessary to minimize impacts from activities where BMPs do not perform as expected: f. Adjust BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level Evaluate the appropriateness of water quaky criteria for reasonably assuming protection of beneficial uses. Consider recommending adjustment of water quality standards, g. Use the existing agreed to process to Implement the State Water Quality Management Plan on lands administered by the USFS as described In Memorandums of Understanding between. 1) the Oregon Department of Environmental Quality and US. Department of Agriculture, Forest Service (Z/12/79 and 12/7/82), and “Attachments A and 8’ referred to In this MOU (Implementation Plan for Water Quality Planning on National Forest lands in the Pacific Northwest 12/78 and Best Management Practices for Range and Grazing Activities on Federal lands) and 2) the State Water Resources Control Board, State of California, and U.S. Department of Agriculture Forest Service, Pacific Southwest Region, 1981.	P, C, R, O	P, B	EIS Sec. 1.5 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.7.1 & 2.7.2 EIS Secs. 4.3.2.2 & 4.3.3.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.7.3.5 EIS App. F.4 POD Att. I POD Att. M POD Att. CC
Water: The following requirements will be employed in protect implementation when proposed projects may affect streams. a. Determine restricted distance from streams for equipment operation, type of stream crossing, if crossing is needed, and erosion control methods, if needed; b. Consider relation of project to riparian strategy areas (all streams classed as I, II and III are allocated to Strategy 26); c. Locate springs that may be affected and evaluate for appropriate levels of protection This would usually require consultation with soil, water or geology specialists; d. In project planning, consider basin constraint percentages by subwatershed as identified in the monitoring plan for watersheds.	P, R	P, B, R, ,	EIS Sec. 2.1.4 EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.7.2 EIS Sec. 4.1.2.5 EIS Secs. 4.3.1.2, 4.3.2.2 & 4.3.3.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS App. F.2 EIS App. F.4 POD. Att. 3 POD Att. I POD Att. W POD Att. X POD Att. BB POD Att. DD
Water: Acquire water rights for development of non-reserved uses.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Water: Design project water monitoring as appropriate.	P	P, B	EIS Secs. 2.3.2.1 & 2.1.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.7.1 & 2.7.2 POD Att. I POD Att. M POD Att. CC
Water: Allow for watershed restoration projects.	P, R	P, B, ,	EIS Sec. 2.1.4 EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.7.2 EIS Sec. 4.1.2.5 EIS Secs. 4.3.1.2, 4.3.2.2 & 4.3.3.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS App. F.2 EIS App. F.4 POD. Att. 3 POD Att. I POD Att. W POD Att. X POD Att. BB POD Att. DD
Water: In-stream flows on National Forest lands should be protected through critical analysis of proposed water uses, diversion and transmission applications and renewal of permits.	N		
Water: Insure that proposed projects have no adverse effects on snow survey sates included in the Regional Forester's memorandum of understanding with the Soil Conservation Service.	N		
Water: Comply with the specific direction for management of each of the municipal watersheds as specified in management agreements between the U.S. Department of Agriculture or Forest and municipalities.	N		
Minerals: Manage existing aggregate sources in compliance with approved Rock Resource Development Plan and an environmental analysis.	N		
Minerals: Rehabilitate aggregate source sites to meet Retention Visual Quality Objective.	N		
Minerals: Under mining laws, claimants are entitled to access to their mining claims Access for exploration and development of locatable mineral resources will be analyzed in response to a proposed operating plan A decision on approval of reasonable access will be made as a result of appropriate environmental analyses.	N		
Minerals: Operating plans for mining operations will be processed In a timely manner in accordance with 36 CFR 228.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Minerals: In plans of operation, require operationally feasible provisions designed to' protect riparian and fishery values, meet State water quality standards: and Insure that disturbed areas are reclaimed Insofar as practicable to a practicable condition.	N		
Minerals: Reclamation plans will Identify management objectives for disturbed areas and detail the procedures and time frames necessary to accomplish the objectives Reclamation bonds will be based on actual reclamation costs and formulated using technical and other resource Input.	N		
Human And Community Development: Conduct compliance reviews as required by Title VI of the Civil Rights Act of 1964, and established Forest Service standards.	N		
Human And Community Development: Inform the general public, including minorities and the underprivileged, of availability and benefits which they are eligible to receive from Forest programs. Techniques to Increase awareness and participation will be used.	N		
Human And Community Development: As directed by the American Indian Religious Freedom Act, the Forest will protect and preserve for Native Americans their inherent right of freedom to believe, express and exercise their traditional religions on Forest lands This includes, but is not limited to, access to ceremonial sites, use and possession of sacred objects, and the freedom to worship through traditional ceremonies and rites.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities compatible with interests of surrounding Indian tribes.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities with the Interest of adjacent communities.	N		
Lands: Revise all special use permits to be constant with the direction in this management strategy when renewed.	N		
Lands: Utilize residual capacity in existing utility condors when applications for rights-of-ways from public or private entities are received Analyze any additional corridors with an environmental analysis.	N		
Lands: Direct applications for electronic sates toward use of sates in the following order. a. Utilizing residual capacity of existing Sates b. Develop new sates identified in the Forest-wade Electronic Site Plan	N		
Lands: Insure that proposed projects do not have adverse effect on lands included in active exchanges.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Lands: Develop rights-of-ways as necessary to implement projects.	P, C, R, O	P, B, R,	EIS Sec. 1.4 EIS Sec. 1.5 EIS Sec. 2.1.6 EIS Sec. 2.3.2.3 EIS Sec. 3.4.3 EIS Sec. 4.7.3.4 POD Att. I POD Att. U POD Att. Y POD Att. BB
Lands: Proposed projects are responsible for distinguishing boundaries between management areas with differing management objectives.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. U POD Att. 21
Lands: Establish and maintain property boundaries on lands administered by the Forest Service.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. U POD Att. T
Soils: Address the potential for detrimental soil displacement, compaction, puddling, severe burning, mass wasting and surface soil erosion in project environmental analysis.	P	P, B,	EIS Sec. 1.5 EIS Sec. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Sec. 4.7.3.4 POD Att. I
Soils: Alternative management practices will be developed or mitigating measures planned and Implemented when activities are likely to result in detrimental displacement, compaction, mass wasting or erosion.	P, R	P, B, ,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Sec. 3.4.3 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Secs. 4.7.3.4 EIS App. F.4 POD Att. I POD Att. DD
Soils: No more than ten percent of an activity area to be compacted, puddled or displaced upon completion of project (not including permanent roads or landings). No more than 20 percent of the area should be displaced or compacted under circumstances resulting from previous management practices, Including roads and landings Permanent recreation facilities or other permanent facilities are exempt.	P, C, R	P, B, A	EIS Sec. 1.5 EIS Sec. 2.1.3.4 EIS Sec. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Sec. 4.7.3.4 POD Att. I EIS App. F.2 LRMP Amendment RRNF-6
Soils: Landslide hazard evaluation will be used to assess potential mass wasting risk by the project. The Rogue Rover National Forest landslide, slope stability and hazard rating maps will be used to determine need for detailed slope stability mapping.	P	P, R	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 3.4.3 EIS Sec. 4.1.2.2 POD Att. I

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Soils: Design management activities to return effective ground cover. The mineral soil exposure should not exceed the following limits overall, based on the erosion hazard rating of the soil type, as defined in the Rogue River National Forest Soil Resource Inventory: a. Forty percent mineral soil exposed on soils classed as very slight, slight, low or moderate erosion hazard soils; b. Thirty percent exposure on high or severe erosion hazard soils; c. Fifteen percent exposure on very high or very severe erosion hazard soils	P	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 POD Att. I
Soils: Rehabilitate adversely impacted sites.	P, R	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 POD Att. I
Facilities: The Access Management Objectives Process, as described in Forest Service Handbook 7709.55, will be used to develop Road Design, Road Operation, Road Maintenance, and Off-Road Travel Criteria These in turn will be used to develop. a. Road and Trawl Design Elements, b. Road and Trawl Design Standards, c. Road Maintenance Levels, d. Road and Trail Maintenance Plans, e. Road Traffic Management Strategies, f. Road Restriction Orders and Traffic Control Devices, g. Off-road Vehicle Management Strategies, h. Travel Maps, and i. Closure Orders.	N		
Facilities: The road system necessary for management of this area will be planned and constructed to minimize the number of intersections with the State Highway, County Road, or Forest Arterial Road along which the scenic management corridor is located. Where possible, local road access for logging will be from the “back side” using spurs from road systems parallel to the Highway.	N		
Facilities: Landscape architect and traffic engineering input will be required for design and operation of intersections of Forest roads with the Highway.	N		
Facilities: Where it is necessary to close a Forest route intersecting the Highway on a seasonal or intermittent basis, the closure shall be designed to achieve the visual qualify objective as viewed from the Highway.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Facilities: Within sensitive soil resource Inventory land types, as shown in Management Strategy 21, the following guidelines apply. a. Geotechnical Input is required for road location, design, and management; b. Temporary roads will be planned, located, surveyed, designed, constructed and operated utilizing the same procedures for reviewing decisions, selecting design elements and standards, and controlling construction, operation, and maintenance as are used for permanent transportation system roads; and c. Roads which access or traverse these land types may be closed seasonally to prevent resource damage.	N		
Facilities: Temporary roads that have been evaluated through the NEPA process are permitted.	P, R	P, B,	EIS Sec. 2.1.4 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.4 POD Att. I POD Att. Y POD Att. DD
Facilities: Roads that are no longer needed shall be obliterated and properly drained when they are taken out of service. Vegetation shall be reestablished within one year.	P, R	P, B,	EIS Sec. 2.1.4 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.4 E POD Att. I POD Att. Y POD Att. DD
Facilities: Power lines and other utilities shall be constructed, operated, and maintained to achieve the visual quality objective as viewed from the Highway.	P, C, R, O	P, B,	EIS Sec. 2.4.2.1 EIS Sec. 2.7.3 EIS Sec. 4.7.3.4 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. A POD Att. I POD Att. S
Protection: Plan pest control alternatives to be biologically selective, cost beneficial and to have no irreversible adverse effect on the environment.	N		
Protection: Suppress pests when outbreaks threaten managed resources and/or users. Use methods that minimize site disturbance.	N		
Protection: Utilize integrated Pest Management strategies to prevent unacceptable damage in visual corridors. Manual, mechanical end cultural methods are emphasized.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Protection: Provide a high level of fire prevention activities consisting of public contact through the use of media, including the use of low watt AM radio stations providing information emphasizing fire prevention is a part of the overall message. High visibility prevention activities include signing and personal public contact et all campgrounds and dispersed recreation areas, rest areas, main road junctions, heavily used public access points, information centers and local businesses.	N		
Protection: Prescription fire is not generally compatible with this management area.	N		
Protection: Treat activity fuels to a level which meets protection standards end resource objectives in a cost-efficient manner.	N		
Protection: Hazard reduction activities will be compatible with management are objectives.	N		
Protection: Design fuelbreaks to meet the natural characteristics of the area.	N		
Protection: Integrate fuelbreak construction with vegetation management projects.	N		
Protection: Conduct prescribed burning in such a manner that it will conform to applicable provisions of the Federal Clean Air Act, Oregon Smoke Management Plan and the Rogue River National Forest Smoke Management Plan.	N		
Protection: Each wildfire will have an appropriate response in accordance with the Rogue River National Forest Fire Management Policy and Plan.	N		
Foreground Partial Retention 07			
Recreation – Roaded Natural: Manage the area for Partial Retention Visual Quality Objective. Catastrophic occurrences may dictate a need for short-term departure from Partial Retention Visual Quality Objective. Blend and shape regeneration openings with the natural terrain to the extent possible. Assess the impacts to visual resources in all project environmental analysis. Specifically address how the visual quality objective will be met.	P, C, O, R	P, B, R,	EIS Sec. 2.1.3.4 EIS Sec. 2.4.2.1 EIS Sec.3.4.1.31 EIS Sec. 4.7.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. A POD Att. I POD Att. S
Recreation – Roaded Natural: Design management activities to meet visual quality objective when viewed from travel routes and critical viewpoints.	P	P, B, R,	EIS Sec. 2.4.2.1 EIS Sec.3.4.1.31 EIS Sec. 4.7.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. A POD Att. I POD Att. S

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Recreation – Roaded Natural: Design projects having high visual impacts with assistance of a landscape architect.	P, R	P,	EIS Sec. 2.1.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 EIS App. F.8 EIS App. K POD Att. A POD Att. DD
Recreation – Roaded Natural: Correct unacceptable form, fine, color or texture as a result of management activities either during the operation or within two years after completion of the activity.	P, R	P, B,	EIS Sec. 2.4.2.1 EIS Sec.3.4.1.31 EIS Sec. 4.7.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. A POD Att. I POD Att. S
Recreation – Roaded Natural: Rehabilitate deteriorated recreation use areas.	N		
Recreation – Roaded Natural: Provide for dispersed recreation activities such as hunting, fishing gathering of forest products and scenic driving.	N		
Recreation – Roaded Natural: Manage trails and dispersed occupancy sites in a manner not in conflict with visual resource values.	N		
Recreation – Roaded Natural: Identify the potential effect of any proposed activity on recreation opportunity spectrum classes in all project environmental analysis.	N		
Recreation – Roaded Natural: Off-road vehicle use is permitted if evidence of use meets the visual quality objective. When this activity begins to adversely impact the visual qualities of these areas, restrictions will be imposed on off-road vehicle activities. These restrictions may include prohibition on types of equipment used, seasonal closures or total closures.	N		
Recreation – Roaded Natural: Viewshed plans will be prepared to provide project level direction for implementing the Forest Plan.	N		
Recreation - Roaded Natural: Protect Special Dispersed Features, including trails, from adverse impacts until management of the special dispersed feature is addressed in an environmental analysis.	N		
Recreation - Roaded Natural: Investigate area to inventory archaeological, historical or other cultural resource properties which may be located within the proposed “area of effect” of projects or elsewhere. Document results of the investigation/ inventory in the protect environmental analysts Inventory of non-project areas will be guarded by the Forest’s cultural resource Inventory strategy.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Recreation - Roaded Natural: Evaluate the cultural resources found within the area using a qualified cultural resource specialist to determine their potential archaeological, historical or cultural significance Evaluate cultural resources on a project-specific basis or by thematic/multi-resource group If a cultural resource is discovered after project activity has begun, the activity will cease or be modified until an evaluation of significance can be made.	N		
Recreation - Roaded Natural: Assess the Impacts of a proposed action to determine the effect of the project upon potentially or known significant cultural resources.	N		
Recreation - Roaded Natural: Mitigate potential adverse Impacts to sign& cant cultural resources by redesigning the project to avoid damage or disturbance, or implementing appropriate mitigation procedures to reduce the adverse impact to the resource.	N		
Recreation - Roaded Natural: Inventory and protect cultural resources to Insure that values are not damaged or destroyed until they can be evaluated for scientific study, interpretation or other appropriate uses Protection of values may include maintenance of structures, avoidance of the site, or scientific removal, analysis and reporting.	N		
Recreation - Roaded Natural: Evaluate and enhance cultural resources for scientific, educational, recreational and ethnic use to the extent the Integrity of the resource is maintained Use will be carefully monitored.	N		
Recreation - Roaded Natural: Develop and administer schedules for long-range cultural resource management Coordinate cultural resource management with appropriate State and Federal agencies.	N		
Recreation - Roaded Natural: Properties that meet the significance criteria will be treated as eligible to the National Register of Historic Places; eligible properties will be nominated to the National Register.	N		
Wilderness: This element is not applicable under a foreground partial retention management strategy.	N		
Wilderness: Project plans will assure that wilderness boundaries are not violated.	N		
Wildlife, Fish and Plants: Permit wildlife and fish projects that do not conflict with recreation management activities and recreation resource values.	P, R	P,	EIS Sec. 2.1.4 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.5.2.3 & 4.5.2.4 EIS Sec. 4.8.1.3 EIS App. F.2 POD Att. S POD Att. DD

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Endangered, threatened and sensitive species (and species proposed for Federal listing by USDA Fish and Wildlife Service (PETS]) will be identified and managed in cooperation with the USDI Fish and Wildlife Service, Oregon Department of Fish and Wildlife, Oregon Department of Agriculture, Oregon Natural Heritage Database, and California Department of Fish and Game.	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 EIS App. F.4 POD Att. J POD Att. DD
Wildlife, Fish and Plants: Legal and biological requirements for the conservation of listed and proposed endangered, threatened and sensitive plant and animal species shall be met. Habitat for existing federally-listed species shall be managed to achieve objectives of recovery plans.	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 EIS App. F.4 POD Att. J POD Att. DD
Wildlife, Fish and Plants: Biological evaluations (FSM 2672.4) shall be prepared for each project authorized, funded or conducted on the Forest. The biological evaluation shall be used to determine the possible effects the proposed activity will have on listed and PETS species. The biological evaluation consists of five steps. a. Pre-field review of existing information; b. Field reconnaissance of the project area, c. Determination of whether local populations of listed and PETS species will be affected by a project; d. Analysis of the significance of project effects on local and total populations of listed and PETS species, e. When step four cannot be completed due to lack of information, a biological or botanical investigation is conducted to gather the information needed to complete step four.	P, R	P,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 EIS App. F.4 POD Att. J POD Att. DD
Wildlife, Fish and Plants: If endangered, threatened or proposed species are found in a prefect area, consultation requirements with the USDI Fish and Wildlife Service shall be met in accordance with the Endangered Species Act (Public Law 93-205) and FSM 2671.4 No adverse Impacts on endangered, threatened or proposed species or their habitats shall occur except when It is possible to compensate adverse effects totally through alternatives identified in a biological opinion rendered by the USDI Fish and Wildlife Service (FSM 2670.31) Before a project can be carried out, protection or mitigation requirements shall be specified (NFMA, 36 CFR 219.27(a)(8)).	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 EIS App. F.4 POD Att. J POD Att. L POD Att. DD
Wildlife, Fish and Plants: If sensitive species are found in a project area, avoidance or other mitigation to minimize Impacts to local populations shall be used for those species whose viability has been identified as a concern (FSM 2670.32) Maintaining viable populations of species throughout their geographic range (FSM 2670.22) shall be an objective during project planning At a minimum, no action shall result in loss of species viability or create significant trends toward Federal listing (FSM 2670.32).	P, C, R, O	P, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Sec. 3.4.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 EIS App. F.4 POD Att. J POD Att. DD

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Northern Spotted Owl - Manage this species under the standards and guidelines established in the ROD for the Supplement to the Environmental Impact Statement for an amendment to the Pacific Northwest Regional Guide In the event that a pair of northern spotted owls are found in an area, consideration will be given to (1) the need to improve the distribution of older forest ecosystems for all associated plant and animal species, (2) providing insight Into management of spotted owl habitat areas (SOHA) through experimental habitat manipulation During the planning and scheduling phase of a timber sale or any other project activity that may Impact spotted owl habitat, conduct a biological evaluation in order to determine the degree of Impact and to provide for protective measures.	P, C, R, O	P, R, ,	EIS Secs. 1.5 EIS Sec. 2.1.4 EIS Sec. 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS Secs. 4.7.3.4 & 4.7.3.6 EIS App. F.7 EIS App. F.4 EIS App. L POD Att. DD
Wildlife, Fish and Plants: Osprey - Protect active nests during the nesting season Land management activities having adverse potential impact should not occur within a 20-chain radius of the nest from March 1 to August 31 Nest and perch trees will be protected until they are no longer usable.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Goshawk – Nest sites will be protected from disturbing human activities during the nesting season. To maintain the physical suitability of nesting areas and prevent disturbances that may cause nesting failures, the period of protection will be from March 1 to August 31 for the area within 20 chains of the active nest.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Goshawk – Each nest site is assumed potentially active until June 1. If monitoring has shown that no nesting attempt has been initiated or that a nesting attempt has failed by June 1, the nest site will be considered inactive and the above nest site restriction may be waived Monitoring will be supervised and evaluated by a qualified wildlife biologist.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Goshawk – Goshawk nests will be protected within a 25 acre no-harvest buffer of trees unless other adjacent alternate buffers are available in a logical basis to maintain habitat over time.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Leave sufficient wildlife trees (hard snags or green trees designated to become snags) in coniferous forest lands to provide for at least 60 percent of the potential population levels for cavity nesting species The distribution of numbers and size class necessary to meet 60 percent per 100 acres is as follows: Siskiyou and Cascade Mixed Conifer Size Number 15+ 179 17+ 36 25+ 3 Total 218 Siskiyou and Cascade True Fir Size Number 15+ 143 17+ 11 25+ 3 Total 157	P, C, R, O	P, R,	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 EIS App. F.7 POD Att. P POD Att. U POD Att. DD

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Species distribution should be representative of the site's original stand Trees selected for retention should maximize use of the stands cull component If the proper number and size of trees do not exist in the stand to be treated, select the proper number from the next lower size class (i.e., if 25" trees are not available go to 17" trees) Material that satisfies the need for down woody material recruitment will come from existing down material, down woody material that is the result of a silvicultural treatment and from the trees that are designated to meet standing wildlife tree requirements The long-term goal for large woody material (LWM) is 10 to 20 pieces of class I and II logs per acre, and all existing class III, IV and V logs except for incidental amounts removed during management activities Additional green merchantable trees will not be designated unless none of the other categories exist The expected life span of snags or dead trees in mixed conifer working groups is 30 years and in true for working groups the life span is 20 years The silvicultural prescription will describe the total number, size and species of wildlife trees that will be required through the next full rotation of the stand being treated Wildlife and down woody material requirement will be included as part of the vegetative (silvicultural) prescription for each stand information for the prescription will be provided by a wildlife biologist based on site by site needs A certified silviculturist will validate the data and include It in the preparation of the final vegetative (silvicultural) prescription that implements all the interdisciplinary requirements The logging system required, reforestation needs, slash disposal requirements and site preparation needs should be compatible with the wildlife tree distribution needs. Primary cavity excavator habitat will be met on areas no larger than 60 acres Including adjacent harvest units The Intent being to provide well distributed habitat and allow adjacent stands to provide the needed wildlife trees for past harvest units where the adjacent stands plus harvest units do not exceed 60 acres Where past harvest units were very large, the adjacent stands within 900 feet would be managed at higher wildlife tree levels to bring the overall area to the 40 percent level When the past harvest units were of such magnitude that the above methods cannot bring the entire area to the 40 percent level, the remaining shortage will not be provided for, but will be recorded and tracked for purposes of monitoring the forest plan Selection of wildlife trees to make up for past deficits will meet the same selection criteria as in newly treated stands Green merchantable trees will not be girdled to create wildlife snags, regardless of the situation, until (5-7) years after project completion (sale closure), in order to capture any mortality that may occur during that time Operational accomplishment will be Included as a monitoring item in the forest plan.	P, C, R, O	P, B,	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 POD Att. P POD Att. U POD Att. DD
Wildlife, Fish and Plants: Deer and Elk - Maintain summer range to provide hiding and thermal cover. Timber harvesting and/or thinning should provide hiding and thermal cover between treatment areas and roads with continuous vehicle use. Hiding cover should be dense enough to hide 90 percent of a deer or elk from view at 200 feet Hiding cover need not be continuous but gaps between screens should not exceed one quarter of a mile. A restricted operating period from April 1 to June 30 may be imposed in identified deer or elk fawning or calving areas.	P, C, R, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Bald Eagle - Develop a bald eagle site management plan for each nesting or roosting area as It is discovered Until a site specific management plan is developed, the following measures will apply Establish the primary nesting zone to be a 330 foot radius around the nest and the secondary zone to be a 660 foot radius around the nest The following activities should not occur within the nesting zones and communal roosting sates 1) Primary Zone All human related activities unless the activities pre-existed to nest discovery and the eagles are apparently tolerant, 2) Secondary Zone - Major land uses such as development of commercial and industrial sites, home, road, powerline or other construction, oil drilling, surface mining, and spraying of chemicals which adversely affect eagles. Timber cutting to enhance habitat is permitted but there is no scheduled timber harvest, 3) Primary and Secondary Zones between January 1 and August 15 - blasting, use of firearms, camping, picnicking, timber harvest, road and water access Into the nesting territory, and low level aircraft operations with helicopters no closer than 1,000 feet and with fixed wing no closer than 500 feet, 4) A communal roost is any stand of trees m which eagles regularly roost together. The primary zone for roosting eagles is 330 feet from the roosting trees and the secondary zone is one-quarter of a mile from the roosting trees. Large trees used as solitary roosts should be left along shoreline of lakes and streams wherever possible Biological evaluation and informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4
Wildlife, Fish and Plants: Peregrine Falcon - Develop a Peregrine falcon site management plan for each nesting area found The site plan design will be tailored to fit the landscape and the use patterns established by the birds. The following may be included in the Plan. 1) Delineate the nest site (eyrie), 2) Define primary (nesting) and secondary and tertiary zones associated with the eyrie, 3) Withdraw the nest site from mineral entry, 4) Restrict management activities and recreational use to September through January: 5) Allow no structural developments within the primary zone unless It benefits the species; 6) Maintain and/or enhance riparian habitats within a three-mile radius of the eyrie, 7) Develop water sources (springs, seeps, ponds, catchments) within approximately one-half mile radius of the eyrie, 8) Implement silvicultural prescriptions, prescribed fire or other management techniques to maintain a mosaic of all vegetative serial stages within the secondary and ternary zones (approximately a three-mile radius of the eyrie); 9) Direct special emphases towards maintaining and/or enhancing mast- and berry-producing shrubs and trees which support jays, bandtail pigeon and other passerine birds. Biological evaluation and Informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7
Range: Livestock grazing will be allowed. Grazing may be encouraged to provide added scenic variety.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

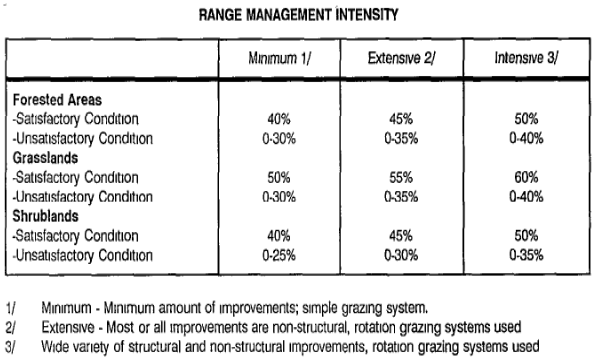
<table>
<tr><th>Element</th><th>Applicable</th><th>Consistency</th><th>Comment</th></tr>
<tr><td>Range: Provide annual permittee plans for livestock distribution and use patterns Where conflicts cannot be resolved or mitigated, relocation or removal of livestock will be considered.</td><td>N</td><td></td><td></td></tr>
<tr><td>Range: Write range allotment plans to reflect management direction for all lands within the allotment boundary Allotment planning procedures are documented m FSM 2210.</td><td>N</td><td></td><td></td></tr>
<tr><td>Range: Develop Coordinated Resource Management Plans where possible and feasible to facilitate the integrated resource management of range and other resources, and between agencies, permittees and other landowners.</td><td>N</td><td></td><td></td></tr>
<tr><td>Range: Allow range improvements that meet partial retention.</td><td>N</td><td></td><td></td></tr>
<tr><td>Range: Allow increases in permitted grazing use to capture increases in transitory range where this is compatible with Foreground Partial Retention objectives.</td><td>N</td><td></td><td></td></tr>
<tr><td>Range: Prescribe kind and amount of grass seeding in silviculture prescriptions.</td><td>N</td><td></td><td></td></tr>
<tr><td>Range: Forage utilization standards will be incorporated in allotment management plans. Allotment management plans may include utilization standards which are lower or rarely higher when associated with intensive grazing systems and specific vegetation management objectives which will meet resource management objectives and the intent of the management strategy. The standards include cumulative annual use by big game and Livestock. Utilization for grass and grass-like species is based on the percent of plant weight removed. Utilization for shrub species is based on incidence of use, weight, and/or twig length (e.g. utilization is 50 percent if 50 out of 100 leaders are browsed). Satisfactory condition is determined by allotment classification and/or forage condition. Unsatisfactory condition is anything not meeting satisfactory conditions. Allowable use of available forage (Maximum percent of annual utilization by big game and livestock) IS:</td><td>N</td><td></td><td></td></tr>
<tr><td>
RANGE MANAGEMENT INTENSITY
<table>
<tr><th></th><th>Minimum 1/</th><th>Extensive 2/</th><th>Intensive 3/</th></tr>
<tr><td>Forested Areas</td><td></td><td></td><td></td></tr>
<tr><td>-Satisfactory Condition</td><td>40%</td><td>45%</td><td>50%</td></tr>
<tr><td>-Unsatisfactory Condition</td><td>0-30%</td><td>0-35%</td><td>0-40%</td></tr>
<tr><td>Grasslands</td><td></td><td></td><td></td></tr>
<tr><td>-Satisfactory Condition</td><td>50%</td><td>55%</td><td>60%</td></tr>
<tr><td>-Unsatisfactory Condition</td><td>0-30%</td><td>0-35%</td><td>0-40%</td></tr>
<tr><td>Shrublands</td><td></td><td></td><td></td></tr>
<tr><td>-Satisfactory Condition</td><td>40%</td><td>45%</td><td>50%</td></tr>
<tr><td>-Unsatisfactory Condition</td><td>0-25%</td><td>0-30%</td><td>0-35%</td></tr>
</table>
1/ Minimum - Minimum amount of improvements; simple grazing system.
2/ Extensive - Most or all improvements are non-structural, rotation grazing systems used
3/ Wide variety of structural and non-structural improvements, rotation grazing systems used</td><td>N</td><td></td><td></td></tr>
<tr><td>Timber: Timber harvest will be scheduled in thus management strategy.</td><td>N</td><td></td><td></td></tr>
</table>

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: When trees are cut for timber production objectives, the cutting shall be made in a way to assure that technology and knowledge exist to adequately restock the site within five years after final harvest (36 CFR 219.27(c)(3)).	N		
Timber: Timber harvesting shall only occur on lands classified as suitable for timber production except for salvage sales, sales necessary to protect other multiple-use values or activities that meet other objectives d the Forest Plan establishes that such actions are appropriate (36 CFR 219.27(c)(l)).	N		
Timber: Treat timber stands to achieve desired visual characteristics through the following practices. a. Sate preparation - chemical, mechanical, biological and manual and prescribed fire; b. Tree improvement (genetics); c. Reforestation by planting. Random natural seeding will count towards reaching desired stocking; d. Growing stock protection from animals, insects and diseases; e. Release and weeding - chemical, mechanical, biological and manual prescribed fire; f. Precommercial thinning; g. Fertilization; h. Commercial thinning; i. Salvage mortality as necessary; j. Final Harvest - even-aged silvicultural system using shelterwood, seed tree or clearcut methods The shelterwood method will probably be the most common, however, selection will be determined by the environmental assessment process and documented in a site-specific silvicultural prescription.	N		
The even-aged silvicultural system will be the most commonly used system in coniferous forests The uneven-aged silvicultural system may be used when healthy, fully stocked, uneven aged stands exist or can be created by identified treatments within a defined time period The selection of the appropriate silvicultural system will be guided by the following criteria. a. Must permit the production of sufficient volume of marketable trees to permit utilization of all trees which meet utilization standards and are designated for harvest. b. Must permit the use of an available and acceptable logging method. c. Must be capable of providing special conditions when required by critical soil conditions or needed to achieve management objectives. d. Must permit control of existing or potential vegetation to a degree that establishment of numbers of trees and rates of growth as identified In site-specific silvicultural prescriptions for harvest areas can be achieved. e. Must promote stand structure and species composition which avoids serious risk of damage from mammals, Insects, disease or wildfire and will allow treatment of existing Insect, disease or fuel conditions. f. Must meet resource and vegetation management objectives.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Utilize uneven-aged management if specific site and vegetation characteristics lend the area to this type of management.	N		
Timber: Manage the area for an overall mix of size classes of trees. The following mix of size class types should be achieved as the overall long term objective for the viewshed: Size Class — % of Land Area 22"-30" — 43 16"-22" — 21 9"-16" — 22 0"-9" — 14	N		
Timber: Emphasize the viewing of large diameter Douglas-fir, ponderosa pine, sugar pine or Shasta fir. Emphasize other species where appropriate. Plan for dispersal of target trees to give the overall character of large trees to the whole area.	N		
Timber: Design "created openings" to meet visual quality objective. The normal maximum size of "created openings" is 5 acres along roads and 3 acres along trails. Unit size applies to all even-aged regeneration units. Exceptions can be designed through the environmental analysis process.	N		
Timber: The timber harvested area will no longer be considered a created opening for visual purposes when trees are 20 feet in height.	N		
Timber: Provide a variety of views into the forest and the adjacent landscape.	N		
Timber: Provide irregular shaped openings to create the overall impression of an undisturbed landscape.	N		
Timber: Created openings will be no more than 4.8 percent of the viewed area per decade with a maximum of 9.6 percent at any one time.	N		
Timber: Permit created openings along a route of not more than 800 ft. per mile and not more than 450 ft. continuously.	N		
Timber: Emphasize a mix of deciduous shrub and ground cover species such as dogwood or vine maple.	N		
Timber: Utilize irregular spacing when thinning.	N		
Timber: Create irregular patterns with plantings with a blend of tree species, approximating natural stands In seed collections no seed lot shall be represented by fewer than 15 families of trees of that species, well distributed across the breeding zone In addition, no family of parent trees shall represent greater than 20 percent of a seed lot Although any given plantation may be planted to a single species, strive for a natural seed source from a variety of species.	N		
Timber: Emphasize a high edge per acre ratio on all even-aged units.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Timber: Make miscellaneous forest products such as poles, posts, boughs, Christmas trees, house logs, etc., available on an as needed basis consistent with the resource objectives of this management area.	N		
Timber: Provide access to potential fuelwood when appropriate Bring fuelwood to convenient points in timber sale or thinning areas Utilize appropriate timber sale clauses or modify fuels management prescriptions to meet this objective.	N		
Timber: Allow commercial fuelwood contracts for slash disposal, thinning and site preparation.	N		
Timber: Open slash areas to fuelwood gathering prior to traditional disposal methods.	N		
Timber: Leave slash as a fuelwood source where there is no conflict with resource activity.	N		
Timber: Consider using the fuelwood program as a means to meet silvicultural objectives in appropriate areas, such as low productivity stands or other stands prior to reaching commercial size.	N		
Timber: Consider the season of year and access when implementing a fuelwood program. The public will be encouraged to burn dry wood.	N		
Timber: Document fuelwood availability for public uses in project environmental analysis.	N		
Timber: Be responsive to the needs of the public for fuelwood.	N		
Timber: Create a Forest fuelwood and miscellaneous products policy to include fuelwood Inventory.	N		
Timber: Rehabilitate and reconstruct developments and resources that have been Impacted by timber sale activities.	N		
Timber: All silvicultural prescriptions will be approved by a certified silviculturalist and reviewed by the District Ranger and Landscape Architect.	N		
Timber: Reforestation, precommercial thinning and release to meet recommended stocking will be addressed with sate specific silvicultural prescriptions.	N		
Timber: The logging system design for timber sales will be reviewed by logging systems specialists and landscape architect Review for feasibility, silviculture compatibility and economics.	N		
Timber: All silvicultural prescriptions and logging plans will be reviewed by a landscape architect for feasibility silvicultural compatibility and the ability to meet the foreground partial retention Visual Qualify Objective.	P	P, B,	EIS Sec. 2.4.2.1 EIS Sec. 3.4.1.31 EIS Sec. 4.7.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. A POD Att. I POD Att. U

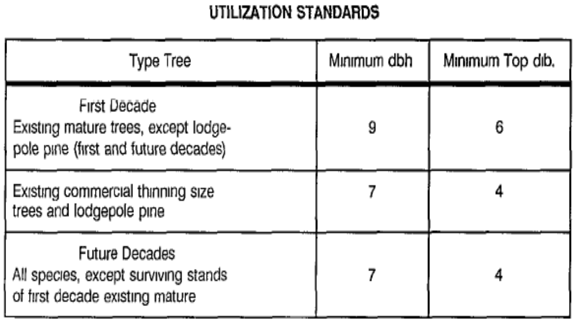
<table>
<tr><th colspan="4">TABLE 2.2-1
Rogue River National Forest Land and Resource Management Plan</th></tr>
<tr><th>Element</th><th>Applicable</th><th>Consistency</th><th>Comment</th></tr>
<tr><td>Timber: Utilization standards for timber harvested will meet the standards as stated in the Pacific Northwest Regional Guide, Standards and Guidelines 4-2 and in Table 3-6. Standards in timber sale contracts may vary depending on markets and costs of harvesting.</td><td>N</td><td></td><td></td></tr>
<tr><td>
UTILIZATION STANDARDS
<table>
<tr><th>Type Tree</th><th>Minimum dbh</th><th>Minimum Top dib.</th></tr>
<tr><td>First Decade
Existing mature trees, except lodgepole pine (first and future decades)</td><td>9</td><td>6</td></tr>
<tr><td>Existing commercial thinning size trees and lodgepole pine</td><td>7</td><td>4</td></tr>
<tr><td>Future Decades
All species, except surviving stands of first decade existing mature</td><td>7</td><td>4</td></tr>
</table></td><td>N</td><td></td><td></td></tr>
<tr><td>Water: Evaluate effects of proposed projects on stream courses In all environmental analysis discuss pertinent stream classification and recommend changes where appropriate as a result of the environmental analysis.</td><td>P</td><td>P</td><td>EIS Sec. 2.4.2.2
EIS Sec. 4.3.2.2
EIS Secs. 4.3.4.1 & 4.3.4.3
EIS Sec. 4.7.3.5
EIS App. F.4
POD Att. I
POD Att. CC</td></tr>
<tr><td>Water: Comply with State requirements in accordance with the Clean Water Act of 1972, as amended (1977 and 1987) for protection of waters of the State of Oregon (Oregon Administrative Rules, Chapter 340-41), and the State of California (Porter-Cologne Water Quality Control Act, Division 7) through planning, application, and monitoring of Best Management Practices (BMPs) in conformance with the Clean Water Act of 1972, as amended (1977 and 1987), regulations, and federal guidance issued thereto.</td><td>P, C, R, O</td><td>P, B</td><td>EIS Secs. 1.4
EIS Sec. 1.5
EIS Secs. 2.4.2.1 & 2.4.2.2
EIS Secs. 2.6.1 & 2.6.2
EIS Secs. 4.3.2.2 & 4.3.3.2
EIS Secs. 4.3.4.1 & 4.3.4.3
EIS Sec. 4.7.3.5
EIS App. F.4POD Att. I
POD Att. M
POD Att. BB</td></tr>
</table>

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Water: In cooperation with the States of Oregon and California, the Forest will use the following process. a. Select and design BMPs based on site specific conditions, technical, economic, and institutional feasibility, and water quality standards for those waters potentially impacted, b. Implement and enforce BMPs; c. Monitor to insure that practices are correctly applied as designed: d. Monitor to determent the effectiveness of practices in meeting design expectations and in attaining water quality standards: e. Evaluate monitoring results and mitigate where necessary to minimize impacts from activities where BMPs do not perform as expected: f. Adjust BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level Evaluate the appropriateness of water quaky criteria for reasonably assuming protection of beneficial uses. Consider recommending adjustment of water quality standards, g. Use the existing agreed to process to Implement the State Water Quality Management Plan on lands administered by the USFS as described In Memorandums of Understanding between. 1) the Oregon Department of Environmental Quality and US. Department of Agriculture, Forest Service (Z/12/79 and 12/7/82), and “Attachments A and 8’ referred to In this MOU (Implementation Plan for Water Quality Planning on National Forest lands in the Pacific Northwest 12/78 and Best Management Practices for Range and Grazing Activities on Federal lands) and 2) the State Water Resources Control Board, State of California, and U.S. Department of Agriculture Forest Service, Pacific Southwest Region, 1981.	P, C, R, O	P, B	EIS Secs. 1.5 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 EIS Secs. 4.3.2.2 & 4.4.3.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.7.3.5 EIS App. F.4 POD Att. I POD Att. M POD Att. BB
Water: The following requirements will be employed in project implementation when proposed projects may affect streams. a. Determine restricted distance from streams for equipment operation, type of stream crossing, if crossing is needed, and erosion control methods, if needed; b. Consider relation of project to riparian strategy areas (all streams classed as I, II and III are allocated to Strategy 26); c. Locate springs that may be affected and evaluate for appropriate levels of protection This would usually require consultation with soil, water or geology specialists; d. In project planning, consider basin constraint percentages by subwatershed as identified in the monitoring plan for watersheds.	P, R	P, B, R, ,	EIS Sec. 2.1.4 EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.5.2 EIS Sec. 4.1.2.5 EIS Secs. 4.3.1.2, 4.3.2.2 & 4.3.3.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. C POD Att. I POD Att. W POD Att. X POD Att. BB POD Att. DD
Water: Acquire water rights for development of non-reserved uses.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Water: Design project water monitoring as appropriate.	P	P, B	EIS Secs. 2.3.2.1 & 2.1.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.7.1 & 2.7.2 POD Att. I POD Att. M POD Att. CC
Water: Allow for watershed restoration projects.	P, R	P,	EIS Sec. 2.1.4 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. DD
Water: In-stream flows on National Forest lands should be protected through critical analysis of proposed water uses, diversion and transmission applications and renewal of permits.	N		
Water: Insure that proposed projects have no adverse effects on snow survey sates included in the Regional Forester's memorandum of understanding with the Soil Conservation Service.	N		
Water: Comply with the specific direction for management of each of the municipal watersheds as specified in management agreements between the U.S. Department of Agriculture or Forest and municipalities.	N		
Minerals: Develop and manage new and existing aggregate sources in compliance with approved Rock Resource Development Plan and an approved environmental analysis.	N		
Minerals: Rehabilitate aggregate source sites to meet Partial Retention Visual Quality Objectives.	N		
Minerals: Under mining laws, claimants are entitled to access to their mining claims Access for exploration and development of locatable mineral resources will be analyzed in response to a proposed operating plan A decision on approval of reasonable access will be made as a result of appropriate environmental analyses.	N		
Minerals: Operating plans for mining operations will be processed In a timely manner in accordance with 36 CFR 228.	N		
Minerals: In plans of operation, require operationally feasible provisions designed to' protect riparian and fishery values, meet State water quality standards: and Insure that disturbed areas are reclaimed Insofar as practicable to a practicable condition.	N		
Minerals: Reclamation plans will Identify management objectives for disturbed areas and detail the procedures and time frames necessary to accomplish the objectives Reclamation bonds will be based on actual reclamation costs and formulated using technical and other resource Input.	N		
Human And Community Development: Conduct compliance reviews as required by Title VI of the Civil Rights Act of 1964, and established Forest Service standards.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Human And Community Development: Inform the general public, including minorities and the underprivileged, of availability and benefits which they are eligible to receive from Forest programs. Techniques to Increase awareness and participation will be used.	N		
Human And Community Development: As directed by the American Indian Religious Freedom Act, the Forest will protect and preserve for Native Americans their inherent right of freedom to believe, express and exercise their traditional religions on Forest lands This includes, but is not limited to, access to ceremonial sites, use and possession of sacred objects, and the freedom to worship through traditional ceremonies and rites.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities compatible with interests of surrounding Indian tribes.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities with the Interest of adjacent communities.	N		
Lands: Revise all special use permits to be constant with the direction in this management strategy when renewed.	N		
Lands: Utilize residual capacity in existing utility condors when applications for rights-of-ways from public or private entities are received Analyze any additional corridors with an environmental analysis.	N		
Lands: Direct applications for electronic sites toward use of sites in the following order. a. Utilizing residual capacity of existing Sates b. Develop new sates identified in the Forest-wade Electronic Site Plan	N		
Lands: Insure that proposed projects do not have adverse effect on lands included in active exchanges.	N		
Lands: Develop rights-of-ways as necessary to implement projects.	P, C, R, O	P, B, R,	EIS Sec. 1.4 EIS Sec. 1.5 EIS Sec. 2.1.6 EIS Sec. 2.3.2.3 EIS Sec. 3.4.3 EIS Sec. 4.7.3.4 POD Att. I POD Att. U POD Att. Y POD Att. BB
Lands: Proposed projects are responsible for distinguishing boundaries between management areas with differing management objectives.	N		
Lands: Establish and maintain property boundaries on lands administered by the Forest Service.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. U POD Att. T1

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Soils: Address the potential for detrimental soil displacement, compaction, puddling, severe burning, mass wasting and surface soil erosion in project environmental analysis.	P	P, B,	EIS Sec. 1.5 EIS Sec. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Sec. 4.7.3.4 POD Att. I
Soils: Alternative management practices will be developed or mitigating measures planned and Implemented when activities are likely to result m detrimental displacement, compaction, mass wasting or erosion.	P, C, R	P, B, R, ,	EIS Sec. 1.5 EIS Sec. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Sec. 4.7.3.4 POD Att. I
Soils: No more than ten percent of an activity area to be compacted, puddled or displaced upon completion of project (not including permanent roads or landings). No more than 20 percent of the area should be displaced or compacted under circumstances resulting from previous management practices, including roads and landings Permanent recreation facilities or other permanent facilities are exempt.	P, C, R	P, B, A	EIS Sec. 1.5 EIS Sec. 2.1.3.4 EIS Sec. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Sec. 4.7.3.4 POD Att. I EIS App. F.2 LRMP Amendment RRNF-6
Soils: Landslide hazard evaluation will be used to assess potential mass wasting risk by the project. The Rogue Rover National Forest landslide, slope stability and hazard rating maps will be used to determine need for detailed slope stability mapping.	P	P, R	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 3.4.3 EIS Sec. 4.1.2.2 POD Att. I
Soils: Design management activities to return effective ground cover. The mineral soil exposure should not exceed the following limits overall, based on the erosion hazard rating of the soil type, as defined in the Rogue River National Forest Soil Resource Inventory: a. Forty percent mineral soil exposed on soils classed as very slight, slight, low or moderate erosion hazard soils; b. Thirty percent exposure on high or severe erosion hazard soils; c. Fifteen percent exposure on very high or very severe erosion hazard soils	P	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 POD Att. I
Soils: Rehabilitate adversely impacted sites.	P, R	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 POD Att. I
Facilities: The Access Management Objectives Process, as described m Forest Service Handbook 7709.55, will be used to develop Road Design, Road Operation, Road Maintenance, and Off-Road Travel Criteria These in turn will be used to develop. Road and Trawl Design Elements, b. Road and Trawl Design Standards, c. Road Maintenance Levels, d. Road and Trail Maintenance Plans, e. Road Traffic Management Strategies, f. Road Restriction Orders and Traffic Control Devices, g. Off-road Vehicle Management Strategies, h. Travel Maps, and i. Closure Orders.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Facilities: The road system necessary for management of this area will be planned and constructed to minimize the number of intersections with the State Highway, County Road, or Forest Arterial Road along which the scenic management corridor is located. Where possible, local road access for logging will be from the "back side" using spurs from road systems parallel to the highway.	N		
Facilities: Landscape architect and traffic engineering input will be required for design and operation of intersections of Forest roads with the Highway.	N		
Facilities: Where it is necessary to close a Forest route intersecting the Highway on a seasonal or intermittent basis, the closure shall be designed to achieve the visual quality objective as viewed from the Highway.	N		
Facilities: Within sensitive soil resource Inventory land types, as shown in Management Strategy 21, the following guidelines apply. a. Geotechnical Input is required for road location, design, and management; b. Temporary roads will be planned, located, surveyed, designed, constructed and operated utilizing the same procedures for reviewing decisions, selecting design elements and standards, and controlling construction, operation, and maintenance as are used for permanent transportation system roads; and c. Roads which access or traverse these land types may be closed seasonally to prevent resource damage.	N		
Facilities: Temporary roads that have been evaluated through the NEPA process are permitted.	P	P, R	EIS Sec. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y
Facilities: Roads that are no longer needed shall be obliterated and properly drained when they are taken out of service Vegetation shall be reestablished within one year.	P, R	P, B,	EIS Sec. 2.1.4 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. Y POD Att. DD
Facilities: Power lines and other utilities shall be constructed, operated, and maintained to achieve the visual quality objective as viewed from the Highway.	P, C, R, O	P, B,	EIS Sec. 2.4.2.1 EIS Sec. 2.7.3 EIS Sec. 4.7.3.4 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. A POD Att. I POD Att. S

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Protection: Plan pest control alternatives to be biologically selective, cost beneficial and to have no irreversible adverse effect on the environment.	N		
Protection: Suppress pests when outbreaks threaten managed resources and/or users. Use methods that minimize site disturbance.	N		
Protection: Utilize integrated Pest Management strategies to prevent unacceptable damage in visual corridors. Manual, mechanical end cultural methods are emphasized.	N		
Protection: Provide a moderate level of fire prevention activities consisting of: public contact through the use of media and personal contact at campgrounds and dispersed recreation areas; and fire prevention signing at campgrounds, rest areas, main road junctions, information centers and local businesses.	N		
Protection: Use prescription fire to obtain the dewed ecological characteristics of the area.	N		
Protection: Treat activity fuels to a level which meets protection standards and resource objectives In a cost-effluent manner.	N		
Protection: Hazard reduction activities will be compatible with management area objectives.	N		
Protection: Design fuel breaks to meet the natural characteristics of the area.	N		
Protection: Integrate fuel break construction with vegetation management projects.	N		
Protection: Conduct prescribed burning in such a manner that it will conform to applicable provisions of the Federal Clean Air Act, Oregon Smoke Management Plan and the Rogue River National Forest Smoke Management Plan.	N		
Protection: Each wildfire will have an appropriate response in accordance with the Rogue River National Forest Fire Management Policy and Plan.	N		
Middleground Retention 08 – Not Applicable, Excluded From Table			
Protection: Each wildfire will have an appropriate response in accordance with the Rogue River National Forest Fire Management Policy and Plan.	N		
Middleground Partial Retention 09			

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Recreation – Roaded Natural: Manage the area for Partial Retention Visual Quality Objective. Catastrophic occurrences may dictate a need for short term departure from partial retention. Blend and shape regeneration openings with the natural terrain to the extent possible. Assess the impacts to visual resources in all project environmental analysis. Specifically address how the visual quality objective will be met.	P, C, R, O	P, B, R, A	EIS Sec. 2.1.3.4 EIS Sec. 2.4.2.1 EIS Sec. 4.7.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. A POD Att. I POD Att. S LRMP Amendment RRNF-4
Recreation - Roaded Natural: Design recreation developments to meet Partial Retention Visual Quality Objectives when viewed from travel routes and critical viewpoints.	N		
Recreation - Roaded Natural: Design projects having high visual impacts with assistance of a landscape architect.	P, R	P,	EIS Sec. 2.1.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 EIS App. F.8 EIS App. K POD Att. A POD Att. DD
Recreation - Roaded Natural: Provide for dispersed recreation activities such as hunting, fishing, gathering of forest products and scenic driving.	N		
Recreation - Roaded Natural: Rehabilitate deteriorated recreation use areas.	N		
Recreation - Roaded Natural: Manage trails and dispersed occupancy sites in a manner not in conflict with visual resource values.	N		
Recreation - Roaded Natural: Identify the potential effect of any proposed activity on recreation opportunity spectrum classes in all project environmental analysis.	P	P,	EIS Sec. 4.7.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. A POD Att. S
Recreation - Roaded Natural: Protect Special Dispersed Features, including trails, from adverse impacts until management of the special dispersed feature is addressed in an environmental analysis.	N		
Recreation - Roaded Natural: Viewshed plans will be prepared to provide project level direction for implementing the Forest Plan.	N		
Recreation - Roaded Natural: Investigate area to Inventory archaeological, historical or other cultural resource properties which may be located within the proposed "area of effect" of projects or elsewhere. Document results of the investigational inventory in the project environmental analysts Inventory of non-project areas will be guided by the Forest's cultural Inventory strategy.	P	P	EIS Sec. 1.5 EIS Secs. 4.11.1.1 – 4.11.1.3 EIS Secs. 4.11.3.3 EIS Secs. 4.11.4 & 4.11.5 POD Att. Z

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Recreation - Roaded Natural: Evaluate the cultural resources found within the area using a qualified cultural resource specialist to determine their potential archaeological, historical or cultural significance Evaluate cultural resources on a project-specific basis or by thematic/multi-resource group If a cultural resource is discovered after project activity has begun, the activity will cease or be modified until an evaluation of significance can be made.	P, C, R, O	P, B	EIS Sec. 1.5 EIS Secs. 4.11.1.1 – 4.11.1.3 EIS Secs. 4.11.3.3 EIS Secs. 4.11.4 & 4.11.5 POD Att. Z
Recreation - Roaded Natural: Assess the Impacts of a proposed action to determine the effect of the project upon potentially or known significant cultural resources.	P	P	EIS Sec. 4.11.3.3
Recreation - Roaded Natural: Mitigate potential adverse impacts to significant cultural resources by redesigning the project to avoid damage or disturbance, or implementing appropriate mitigation procedures to reduce the adverse impact to the resource.	P, C, R, O	P, B, R	EIS Sec. 3.4.3 EIS Sec. 4.11.3.3 EIS Sec. 4.11.4 POD Att. Z
Recreation - Roaded Natural: Inventory and protect cultural resources to Insure that values are not damaged or destroyed until they can be evaluated for scientific study, interpretation or other appropriate uses. Protection of values may include maintenance of structures, avoidance of the site, or scientific removal, analysis and reporting.	P, C, O	P, B, R	EIS Sec. 1.5 EIS Secs. 4.11.1.1 – 4.11.1.3 EIS Secs. 4.11.3.3 EIS Secs. 4.11.4 & 4.11.5 POD Att. Z
Recreation - Roaded Natural: Evaluate and enhance cultural resources for scientific, educational, recreational and ethnic use to the extent the Integrity of the resource is maintained use will be carefully monitored.	N		
Recreation - Roaded Natural: Develop and administer schedules for long-range cultural resource management Coordinate cultural resource management with appropriate State and Federal agencies.	N		
Recreation - Roaded Natural: Properties that meet the significance criteria will be treated as eligible to the National Register of Historic Places; eligible properties will be nominated to the National Register.	P	P	EIS Sec. 1.5 EIS Sec. 4.11.3.3 EIS Sec. 4.11.5
Recreation - Roaded Natural: Off-road vehicle recreation use on roads, trails or areas is permissible, if not in conflict with strategy goals and objectives.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.7.2 EIS Sec. 2.8.3 EIS Sec. 4.2.2.1 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Sec. 4.8.2.3 EIS Secs. 4.10.2.5 & 4.10.2.6 POD Att. A POD Att. S POD Att. Y
Wilderness: This element is not applicable under a middleground partial retention management strategy.	N		
Wilderness: Project plans will assure that wilderness boundaries are not violated.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Permit wildlife and fish projects that do not conflict with recreation management activities and recreation resource values.	P, R	P,	EIS Sec. 2.1.4 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.5.2.3 & 4.5.2.4 EIS Sec. 4.8.1.3 EIS App. F.2 POD Att. S POD Att. DD
Wildlife, Fish and Plants: Endangered, threatened and sensitive species (and species proposed for Federal listing by USDA Fish and Wildlife Service [PETS]) will be identified and managed in cooperation with the USDI Fish and Wildlife Service, Oregon Department of Fish and Wildlife, Oregon Department of Agriculture, Oregon Natural Heritage Database, and California Department of Fish and Game.	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.4 EIS App. F.7 POD Att. J POD Att. DD
Wildlife, Fish and Plants: Legal and biological requirements for the conservation of listed and proposed endangered, threatened and sensitive plant and animal species shall be met. Habitat for existing federally-listed species shall be managed to achieve objectives of recovery plans.	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.4 EIS App. F.7 POD Att. J POD Att. DD
Wildlife, Fish and Plants: Biological evaluations (FSM 2672 4) shall be prepared for each project authorized, funded or conducted on the Forest. The biological evaluation shall be used to determine the possible effects the proposed activity will have on listed and PETS species. The biological evaluation consists of five steps. a. Pre-field review of existing information; b. Field reconnaissance of the project area, c. Determination of whether local populations of listed and PETS species will be affected by a project; d. Analysis of the significance of project effects on local and total populations of listed and PETS species, e. When step four cannot be completed due to lack of information, a biological or botanical investigation is conducted to gather the information needed to complete step four.	P, R	P,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.4 EIS App. F.7 POD Att. J POD Att. DD
Wildlife, Fish and Plants: If endangered, threatened or proposed species are found in a project area, consultation requirements with the USDI Fish and Wildlife Service shall be met in accordance with the Endangered Species Act (Public Law 93-205) and FSM 2671.4 No adverse Impacts on endangered, threatened or proposed species or their habitats shall occur except when It is possible to compensate adverse effects totally through alternatives identified in a biological opinion rendered by the USDI Fish and Wildlife Service (FSM 2670.31) Before a project can be carried out, protection or mitigation requirements shall be specified (NFMA, 36 CFR 219.27(a)(8)).	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.4 EIS App. F.7POD Att. J POD Att. L POD Att. DD

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: If sensitive species are found in a project area, avoidance or other mitigation to minimize Impacts to local populations shall be used for those species whose viability has been identified as a concern (FSM 2670.32) Maintaining viable populations of species throughout their geographic range (FSM 2670.22) shall be an objective during project planning At a minimum, no action shall result in loss of species viability or create significant trends toward Federal listing (FSM 2670.32).	P, C, R, O	P, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Sec. 3.4.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.4 EIS App. F.7 POD Att. J POD Att. DD
Wildlife, Fish and Plants: Northern Spotted Owl - Manage this species under the standards and guidelines established in the ROD for the Supplement to the Environmental Impact Statement for an amendment to the Pacific Northwest Regional Guide In the event that a pair of northern spotted owls are found in an area, consideration will be given to (1) the need to improve the distribution of older forest ecosystems for all associated plant and animal species, (2) providing insight Into management of spotted owl habitat areas (SOHA) through experimental habitat manipulation During the planning and scheduling phase of a timber sale or any other project activity that may Impact spotted owl habitat, conduct a biological evaluation in order to determine the degree of Impact and to provide for protective measures.	P, C, R, O	P, R, ,	EIS Secs. 1.5 EIS Sec. 2.1.4 EIS Sec. 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS Secs. 4.7.3.4 & 4.7.3.6 EIS App. F.3 EIS App. F.4 EIS App. F.7 POD Att. DD
Wildlife, Fish and Plants: Osprey - Protect active nests during the nesting season Land management activities having adverse potential impact should not occur within a 20-chain radius of the nest from March 1 to August 31 Nest and perch trees will be protected until they are no longer usable.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Goshawk – Nest sites will be protected from disturbing human activities during the nesting season. To maintain the physical suitability of nesting areas and prevent disturbances that may cause nesting failures, the period of protection will be from March 1 to August 31 for the area within 20 chains of the active nest.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Goshawk – Each nest site is assumed potentially active until June 1. If monitoring has shown that no nesting attempt has been initiated or that a nesting attempt has failed by June 1, the nest site will be considered inactive and the above nest site restriction may be waived Monitoring will be supervised and evaluated by a qualified wildlife biologist.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Goshawk – Goshawk nests will be protected within a 25 acre no-harvest buffer of trees unless other adjacent alternate buffers are available in a logical basis to maintain habitat over time.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Leave sufficient wildlife trees (hard snags or green trees designated to become snags) in coniferous forest lands to provide for at least 60 percent of the potential population levels for cavity nesting species The distribution of numbers and size class necessary to meet 60 percent per 100 acres is as follows: Siskiyou and Cascade Mixed Conifer Size Number 15+ 179 17+ 36 25+ 3 Total 218 Siskiyou and Cascade True Fir Size Number 15+ 143 17+ 11 25+ 3 Total 157	P, C, R, O	P, R,	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 POD Att. P POD Att. U POD Att. DD EIS App. F.7
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Species distribution should be representative of the site's original stand Trees selected for retention should maximize use of the stands cull component If the proper number and size of trees do not exist in the stand to be treated, select the proper number from the next lower size class (i.e., if 25" trees are not available go to 17" trees) Material that satisfies the need for down woody material recruitment will come from existing down material, down woody material that is the result of a silvicultural treatment and from the trees that are designated to meet standing wildlife tree requirements The long-term goal for large woody material (LWM) is 10 to 20 pieces of class I and II logs per acre, and all existing class III, IV and V logs except for incidental amounts removed during management activities Additional green merchantable trees will not be designated unless none of the other categories exist The expected life span of snags or dead trees in mixed conifer working groups is 30 years and in true for working groups the life span is 20 years The silvicultural prescription will describe the total number, size and species of wildlife trees that will be required through the next full rotation of the stand being treated Wildlife and down woody material requirement will be included as part of the vegetative (silvicultural) prescription for each stand information for the prescription will be provided by a wildlife biologist based on site by site needs A certified silviculturist will validate the data and include It in the preparation of the final vegetative (silvicultural) prescription that implements all the interdisciplinary requirements The logging system required, reforestation needs, slash disposal requirements and site preparation needs should be compatible with the wildlife tree distribution needs. Primary cavity excavator habitat will be met on areas no larger than 60 acres Including adjacent harvest units The Intent being to provide well distributed habitat and allow adjacent stands to provide the needed wildlife trees for past harvest units where the adjacent stands plus harvest units do not exceed 60 acres Where past harvest units were very large, the adjacent stands within 900 feet would be managed at higher wildlife tree levels to bring the overall area to the 40 percent level When the past harvest units were of such magnitude that the above methods cannot bring the entire area to the 40 percent level, the	P, C, R, O	P, B,	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 EIS App. F.7 POD Att. P POD Att. U POD Att. DD

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
remaining shortage will not be provided for, but will be recorded and tracked for purposes of monitoring the forest plan Selection of wildlife trees to make up for past deficits will meet the same selection criteria as in newly treated stands Green merchantable trees will not be girdled to create wildlife snags, regardless of the situation, until (5-7) years after project completion (sale closure), in order to capture any mortality that may occur during that time Operational accomplishment will be Included as a monitoring item in the forest plan.			
Wildlife, Fish and Plants: Deer and Elk - Maintain summer range to provide forage, hiding and thermal cover at or above 20 percent level In addition, where consistent with the goal statement of this strategy, maintain 40 percent of each 500-l,000-acre area of non-critical deer and elk wintering area in a condition to provide for thermal cover Timber harvesting and/or thinning should provide hiding and thermal cover between treatment areas and roads with continuous vehicle use Hiding cover should be dense enough to hide 90 percent of a deer or elk from view at 200 feet Hiding cover need not be continuous but gaps between screens should not exceed one-quarter of a mile A restricted operating period from April 1 to June 30 may be Imposed in identified deer or elk fawning or calving areas.	P, C, R, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Bald Eagle - Develop a bald eagle site management plan for each nesting or roosting area as It is discovered Until a site specific management plan is developed, the following measures will apply Establish the primary nesting zone to be a 330 foot radius around the nest and the secondary zone to be a 660 foot radius around the nest The following activities should not occur within the nesting zones and communal roosting sates 1) Primary Zone All human related activities unless the activities pre-existed to nest discovery and the eagles are apparently tolerant, 2) Secondary Zone - Major land uses such as development of commercial and industrial sites, home, road, powerline or other construction, oil drilling, surface mining, and spraying of chemicals which adversely affect eagles. Timber cutting to enhance habitat is permitted but there is no scheduled timber harvest, 3) Primary and Secondary Zones between January 1 and August 15 - blasting, use of firearms, camping, picnicking, timber harvest, road and water access Into the nesting territory, and low level aircraft operations with helicopters no closer than 1,000 feet and with fixed wing no closer than 500 feet, 4) A communal roost is any stand of trees m which eagles regularly roost together. The primary zone for roosting eagles is 330 feet from the roosting trees and the secondary zone is one-quarter of a mile from the roosting trees. Large trees used as solitary roosts should be left along shoreline of lakes and streams wherever possible Biological evaluation and informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Wildlife, Fish and Plants: Peregrine Falcon - Develop a Peregrine falcon site management plan for each nesting area found The site plan design will be tailored to fit the landscape and the use patterns established by the birds. The following may be included in the Plan. 1) Delineate the nest site (eyrie), 2) Define primary (nesting) and secondary and tertiary zones associated with the eyrie, 3) Withdraw the nest site from mineral entry, 4) Restrict management activities and recreational use to September through January: 5) Allow no structural developments within the primary zone unless It benefits the species; 6) Maintain and/or enhance riparian habitats within a three-mile radius of the eyrie, 7) Develop water sources (springs, seeps, ponds, catchments) within approximately one-half mile radius of the eyrie, 8) Implement silvicultural prescriptions, prescribed fire or other management techniques to maintain a mosaic of all vegetative serial stages within the secondary and ternary zones (approximately a three-mile radius of the eyrie); 9) Direct special emphases towards maintaining and/or enhancing mast- and berry-producing shrubs and trees which support jays, bandtail pigeon and other passerine birds. Biological evaluation and Informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7
Range: Permit livestock grazing on transitory ranges under the following situations: a. Where forage occurs in natural stands or as a result of site disturbance and/or timber canopy removal on a periodic basis. b. Where disturbed sites and/or areas under timber management can be seeded with species which improve forage production and does not restrict tree establishment and growth. (FSM 2521.02, RR Supplement #6, 2173) c. On forest plantations when livestock will not damage the young trees.	N		
Range: Permit livestock grazing on primary and secondary range.	N		
Range: Provide annual permittee plans for livestock distribution and use patterns Where conflicts cannot be resolved or mitigated, relocation or removal of livestock will be considered.	N		
Range: Write range allotment plans to reflect management direction for all lands within the allotment boundary Allotment planning procedures are documented m FSM 2210.	N		
Range: Develop Coordinated Resource Management Plans where possible and feasible to facilitate the integrated resource management of range and other resources, and between agencies, permittees and other landowners.	N		
Range: Allow range improvements.	N		
Range: Allow increases In permitted grazing use to capture increases in transitory range where this is compatible with Middleground Partial Retention objectives.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

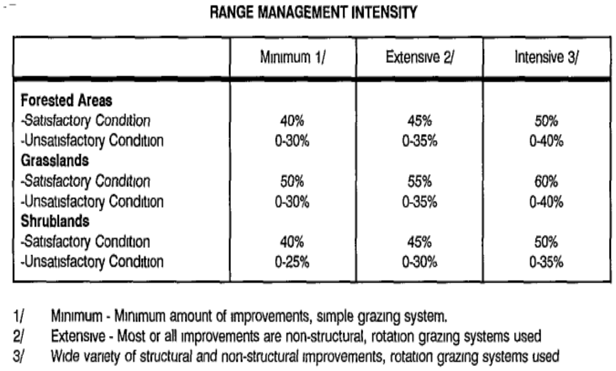
<table>
<tr><th>Element</th><th>Applicable</th><th>Consistency</th><th>Comment</th></tr>
<tr><td><u>Range:</u> Prescribe kind and amount of grass seeding in silviculture prescriptions.</td><td>N</td><td></td><td></td></tr>
<tr><td><u>Range:</u> Forage utilization standards will be incorporated in allotment management plans. Allotment management plans may include utilization standards which are lower or rarely higher when associated with intensive grazing systems and specific vegetation management objectives which will meet resource management objectives and the intent of the management strategy. The standards include cumulative annual use by big game and Livestock. Utilization for grass and grass-like species is based on the percent of plant weight removed. Utilization for shrub species is based on incidence of use, weight, and/or twig length (e.g. utilization is 50 percent if 50 out of 100 leaders are browsed). Satisfactory condition is determined by allotment classification and/or forage condition. Unsatisfactory condition is anything not meeting satisfactory conditions. Allowable use of available forage (Maximum percent of annual utilization by big game and livestock) IS:</td><td>N</td><td></td><td></td></tr>
<tr><td>
RANGE MANAGEMENT INTENSITY
<table>
<tr><th></th><th>Minimum 1/</th><th>Extensive 2/</th><th>Intensive 3/</th></tr>
<tr><td>Forested Areas</td><td></td><td></td><td></td></tr>
<tr><td>-Satisfactory Condition</td><td>40%</td><td>45%</td><td>50%</td></tr>
<tr><td>-Unsatisfactory Condition</td><td>0-30%</td><td>0-35%</td><td>0-40%</td></tr>
<tr><td>Grasslands</td><td></td><td></td><td></td></tr>
<tr><td>-Satisfactory Condition</td><td>50%</td><td>55%</td><td>60%</td></tr>
<tr><td>-Unsatisfactory Condition</td><td>0-30%</td><td>0-35%</td><td>0-40%</td></tr>
<tr><td>Shrublands</td><td></td><td></td><td></td></tr>
<tr><td>-Satisfactory Condition</td><td>40%</td><td>45%</td><td>50%</td></tr>
<tr><td>-Unsatisfactory Condition</td><td>0-25%</td><td>0-30%</td><td>0-35%</td></tr>
</table>
1/ Minimum - Minimum amount of improvements, simple grazing system.
2/ Extensive - Most or all improvements are non-structural, rotation grazing systems used
3/ Wide variety of structural and non-structural improvements, rotation grazing systems used</td><td>N</td><td></td><td></td></tr>
<tr><td><u>Timber:</u> Timber harvest will be scheduled.</td><td>N</td><td></td><td></td></tr>
<tr><td><u>Timber:</u> When trees are cut for timber production objectives, the cutting shall be made in a way to assure that technology and knowledge exist to adequately restock the site within five years after final harvest (36 CFR 219 27(c)(3)).</td><td>N</td><td></td><td></td></tr>
<tr><td><u>Timber:</u> Timber harvesting shall only occur on lands classified as suitable for timber production except for salvage sales, sales necessary to protect other multiple-use values or activities that meet other objectives d the Forest Plan establishes that such actions are appropriate (36 CFR 219 27(c)(l)).</td><td>N</td><td></td><td></td></tr>
</table>

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Treat timber stands to achieve desired visual characteristics through the following practices. a. Site preparation - chemical, mechanical, biological and manual and prescribed fire; b. Tree improvement (genetics); c. Reforestation by planting Random natural seeding will count towards reaching desired stocking; d. Growing stock protection from animals, insects and diseases; e. Release and weeding - chemical, mechanical, biological and manual and prescribed fire; f. Precommercial thinning; g. Fertilization; h. Commercial thinning; i. Salvage mortality as necessary; j. Final Harvest - even-aged silvicultural system using shelterwood, seed tree or clearcut methods The shelterwood method will probably be the most common, however, selection will be determined by the environmental assessment process and documented in a site-specific silvicultural prescription.	N		
Timber: Provide a mosaic of vegetative textures with natural shaped openings that are evident but are not dominant.	N		
Timber: The normal maximum size of “created openings” is 15 acres. Unit size applies to all even-aged regression units. Exceptions can be designed through the environmental analysis process.	N		
Timber: Created openings will be separated by areas generally not classed as created openings. The areas between created openings shall contain one or more logical harvest units. These areas shall be large enough and contain a stand structure to meet resource requirements of the management area. The total area of created openings contiguous to 30 acre or larger natural openings should normally be limited to an area not exceeding l/3 the size of the natural opening and not occupying more than l/3 of the natural opening perimeter. Openings should not be created adjacent to any natural openings unless adequate vegetation along the edge can be developed or retained in sufficient density to protect values and visual management objectives. The determination of adequate vegetation will be made by an appropriate interdisciplinary team.	N		
Timber: The timber harvested area will no longer be considered a created opening for visual purposes when trees are 20 feet in height and free to grow.	N		
Timber: Provide a minimum of 600 feet between created openings.	N		
Timber: Created openings will be no more than 7 percent of the viewed area per decade with a maximum of 14 percent at any one time.	N		
Timber: Emphasize a high edge per-acre ratio on all even-aged units.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Timber: Rehabilitate and reconstruct developments and resources that have been Impacted by timber sale activities.	N		
Timber: All silvicultural prescriptions will be approved by a certified silviculturalist and reviewed by the Distinct Ranger.	Yes? P, R	P, B,	EIS Secs. 1.5 EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS App. F.2 POD Att. I POD Att. U POD Att. DD
Timber: The logging system design for umber sales will be reviewed by logging systems specialists designated by the Forest Supervisor Review for feasibility, silvicultural compatibility and economics.	N		
Timber: The even-aged silvicultural system will be the most commonly used system m coniferous forests. The uneven-aged silvicultural system may be used when healthy, fully stocked, uneven-aged stands exist or can be created by identified treatments within a defined time period The selection of the appropriate silvicultural system will be guided by the following criteria. a. Must permit the production of sufficient volume of marketable trees to permit utilization of all trees which meet utilization standards and are designated for harvest. b. Must permit the use of an available and acceptable logging method. c. Must be capable of providing special conditions when required by critical soil conditions or needed to achieve management objectives. d. Must permit control of existing or potential vegetation to a degree that establishment of numbers of trees and rates of growth as identified In site-specific silvicultural prescriptions for harvest areas can be achieved. e. Must promote stand structure and species composition which avoids serious risk of damage from mammals, Insects, disease or wildfire and will allow treatment of existing Insect, disease or fuel conditions. f. Must meet resource and vegetation management objectives Identified for this management area.	N		
Timber: Strive for reasonably balanced acreage in each age class to obtain diversity in each locator area.	N		
Timber: Reforestation, precommercial thinning and release to meet recommended (full) stocking will be addressed with site-specific silvicultural prescriptions.	N		
Timber: Set harvest treatment priorities by cut categories on each District so that the stands most needing treatment are done first, wherever reasonably possible.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Maintain a blend of tree species approximating natural stands In seed collections, no seed lot shall be represented by fewer than 15 families of trees of that species well distributed across the breeding zone In addition, no family of parent trees shall represent greater than 20 percent of a seed lot Although any given plantation may be planted to a single species, strive for a natural seed source from a variety of species.	N		
Timber: Make miscellaneous forest products such as poles, posts, boughs, Christmas trees, house logs, etc., available on an as needed basis consistent with the resource objectives of this management area.	N		
Timber: Provide access to potential fuelwood when appropriate Bring fuelwood to convenient points in timber sale or thinning areas Utilize appropriate timber sale clauses or modify fuels management prescriptions to meet this objective.	N		
Timber: Allow commercial fuelwood contracts for slash disposal, thinning and site preparation.	N		
Timber: Open slash areas to fuelwood gathering prior to traditional disposal methods.	N		
Timber: Leave slash as a fuelwood source where there is no conflict with resource activity.	N		
Timber: Consider using the fuelwood program as a means to meet silvicultural objectives in appropriate areas, such as low productivity stands or other stands prior to reaching commercial size.	N		
Timber: Consider the season of year and access when implementing a fuelwood program. The public will be encouraged to burn dry wood.	N		
Timber: Document fuelwood availability for public uses in project environmental analysis.	N		
Timber: Be responsive to the needs of the public for fuelwood.	N		
Timber: Create a Forest fuelwood and miscellaneous products policy to include fuelwood Inventory.	N		
Timber: All silvicultural prescriptions and logging plans will be reviewed by a landscape architect for feasibility, silvicultural compatibility and the ability to meet middleground partial/ retention Visual Quality Objective.	N		
Timber: Utilization standards for timber harvested will meet the standards as stated in the Pacific Northwest Regional Guide, Standards and Guidelines 4-2 and in Table 3-6. Standards in timber sale contracts may vary depending on markets and costs of harvesting.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

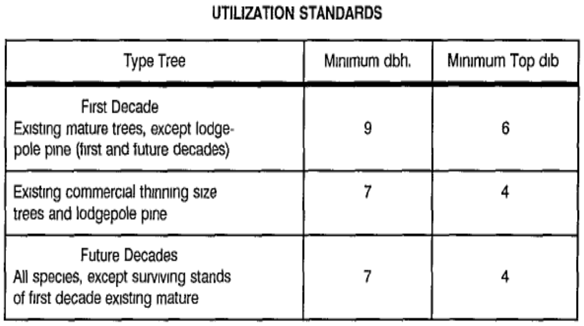
<table>
<tr><th>Element</th><th>Applicable</th><th>Consistency</th><th>Comment</th></tr>
<tr><td>
UTILIZATION STANDARDS
<table>
<tr><th>Type Tree</th><th>Minimum dbh.</th><th>Minimum Top dib</th></tr>
<tr><td>First Decade
Existing mature trees, except lodgepole pine (first and future decades)</td><td>9</td><td>6</td></tr>
<tr><td>Existing commercial thinning size trees and lodgepole pine</td><td>7</td><td>4</td></tr>
<tr><td>Future Decades
All species, except surviving stands of first decade existing mature</td><td>7</td><td>4</td></tr>
</table></td><td>N</td><td></td><td></td></tr>
<tr><td><u>Water:</u> Evaluate effects of proposed projects on stream courses In all environmental analysis discuss pertinent stream classification and recommend changes where appropriate as a result of the environmental analysis.</td><td>P</td><td>P</td><td>EIS Sec. 2.4.2.2
EIS Sec. 4.3.2.2
EIS Secs. 4.3.4.1 & 4.3.4.3
EIS Sec. 4.7.3.5
EIS App. F.4
POD Att. I
POD Att. CC</td></tr>
<tr><td><u>Water:</u> Comply with State requirements in accordance with the Clean Water Act of 1972, as amended (1977 and 1987) for protection of waters of the State of Oregon (Oregon Administrative Rules, Chapter 340-41), and the State of California (Porter-Cologne Water Quality Control Act, Division 7) through planning, application, and monitoring of Best Management Practices (BMPs) in conformance with the Clean Water Act of 1972, as amended (1977 and 1987), regulations, and federal guidance issued thereto.</td><td>P, C, R, O</td><td>P, B</td><td>EIS Secs. 1.4
EIS Sec. 1.5
EIS Secs. 2.4.2.1 & 2.4.2.2
EIS Secs. 2.6.1 & 2.6.2
EIS Secs. 4.3.2.2 & 4.3.3.2
EIS Secs. 4.3.4.1 & 4.3.4.3
EIS Sec. 4.7.3.5
EIS App. F.4
POD Att. I
POD Att. M
POD Att. BB</td></tr>
</table>

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Water: In cooperation with the States of Oregon and California, the Forest will use the following process. a. Select and design BMPs based on site specific conditions, technical, economic, and institutional feasibility, and water quality standards for those waters potentially impacted; b. Implement and enforce BMPs; c. Monitor to insure that practices are correctly applied as designed: d. Monitor to determent the effectiveness of practices in meeting design expectations and in attaining water quality standards; e. Evaluate monitoring results and mitigate where necessary to minimize impacts from activities where BMPs do not perform as expected; f. Adjust BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level Evaluate the appropriateness of water quaky criteria for reasonably assuming protection of beneficial uses. Consider recommending adjustment of water quality standards; g. Use the existing agreed to process to Implement the State Water Quality Management Plan on lands administered by the USFS as described In Memorandums of Understanding between. 1) the Oregon Department of Environmental Quality and US. Department of Agriculture, Forest Service (Z/12/79 and 12/7/82), and “Attachments A and 8’ referred to In this MOU (Implementation Plan for Water Quality Planning on National Forest lands in the Pacific Northwest 12/78 and Best Management Practices for Range and Grazing Activities on Federal lands) and 2) the State Water Resources Control Board, State of California, and U.S. Department of Agriculture Forest Service, Pacific Southwest Region, 1981.	P, C, R, O	P, B	EIS Sec. 1.5 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 EIS Secs. 4.3.2.2 & 4.3.3.2 EIS Secs. 4.3.4.1 & 4.3.3.3 EIS Sec. 4.7.3.5 EIS App. F.4 POD Att. I POD Att. M POD Att. CC
Water: The following requirements will be employed in protect implementation when proposed projects may affect streams. a. Determine restricted distance from streams for equipment operation, type of stream crossing, if crossing is needed, and erosion control methods, if needed; b. Consider relation of project to riparian strategy areas (all streams classed as I, II and III are allocated to Strategy 26); c. Locate springs that may be affected and evaluate for appropriate levels of protection This would usually require consultation with soil, water or geology specialists; d. In project planning, consider basin constraint percentages by subwatershed as identified in the monitoring plan for watersheds.	P, R	P, B, R, ,	EIS Sec. 2.1.4 EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.7.2 EIS Sec. 4.1.2.5 EIS Secs. 4.3.1.2, 4.3.2.2 & 4.3.3.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. C POD Att. I POD Att. W POD Att. X POD Att. BB POD Att. DD
Water: Acquire water rights for development of non-reserved uses.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Water: Design project water monitoring as appropriate.	P	P, B	EIS Secs. 2.3.2.1 & 2.1.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.7.1 & 2.7.2 POD Att. I POD Att. M POD Att. CC
Water: Allow for watershed restoration projects.	P, R	P,	EIS Sec. 2.1.4 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. DD
Water: In-stream flows on National Forest lands should be protected through critical analysis of proposed water uses, diversion and transmission applications and renewal of permits.	N		
Water: Insure that proposed projects have no adverse effects on snow survey sates included in the Regional Forester's memorandum of understanding with the Soil Conservation Service.	N		
Minerals: Develop and manage new and existing aggregate sources in compliance with approved Rock Resource Development Plan and an approved environmental analysis.	N		
Minerals: Rehabilitate aggregate source sites to meet Retention Visual Quality Objective.	N		
Minerals: Under mining laws, claimants are entitled to access to their mining claims Access for exploration and development of locatable mineral resources will be analyzed in response to a proposed operating plan A decision on approval of reasonable access will be made as a result of appropriate environmental analyses.	N		
Minerals: Operating plans for mining operations will be processed In a timely manner in accordance with 36 CFR 228.	N		
Minerals: In plans of operation, require operationally feasible provisions designed to' protect riparian and fishery values, meet State water quality standards: and Insure that disturbed areas are reclaimed Insofar as practicable to a practicable condition.	N		
Minerals: Reclamation plans will Identify management objectives for disturbed areas and detail the procedures and time frames necessary to accomplish the objectives Reclamation bonds will be based on actual reclamation costs and formulated using technical and other resource Input.	N		
Human And Community Development: Conduct compliance reviews as required by Title VI of the Civil Rights Act of 1964, and established Forest Service standards.	N		
Human And Community Development: Inform the general public, including minorities and the underprivileged, of availability and benefits which they are eligible to receive from Forest programs. Techniques to Increase awareness and participation will be used.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Human And Community Development: As directed by the American Indian Religious Freedom Act, the Forest will protect and preserve for Native Americans their inherent right of freedom to believe, express and exercise their traditional religions on Forest lands This includes, but is not limited to, access to ceremonial sites, use and possession of sacred objects, and the freedom to worship through traditional ceremonies and rites.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities compatible with interests of surrounding Indian tribes.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities with the Interest of adjacent communities.	N		
Lands: Revise all special use permits to be constant with the direction in this management strategy when renewed.	N		
Lands: Utilize residual capacity in existing utility condors when applications for rights-of-ways from public or private entities are received Analyze any additional corridors with an environmental analysis.	N		
Lands: Direct applications for electronic sates toward use of sates in the following order. a. Utilizing residual capacity of existing Sates b. Develop new sates identified in the Forest-wade Electronic Site Plan	N		
Lands: Insure that proposed projects do not have adverse effect on lands included in active exchanges.	N		
Lands: Develop rights-of-ways as necessary to implement projects.	P, C, R, O	P, B, R,	EIS Sec. 1.4 EIS Sec. 1.5 EIS Sec. 2.1.6 EIS Sec. 2.3.2.3 EIS Sec. 3.4.3 EIS Sec. 4.7.3.4 POD Att. I POD Att. U POD Att. Y POD Att. BB
Lands: Proposed projects are responsible for distinguishing boundaries between management areas with differing management objectives.	N		
Lands: Establish and maintain property boundaries on lands administered by the Forest Service.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. U POD Att. 21
Soils: Address the potential for detrimental soil displacement, compaction, puddling, severe burning, mass wasting and surface soil erosion in project environmental analysis.	P	P, B,	EIS Sec. 1.5 EIS Sec. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Sec. 4.7.3.4 POD Att. I

TABLE 2.2-1

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Element	Applicable	Consistency	Comment
Soils: Alternative management practices will be developed or mitigating measures planned and Implemented when activities are likely to result m detrimental displacement, compaction, mass wasting or erosion.	P, R	P, B, ,	EIS Sec. 1.5 EIS Sec. 2.4.2.1 EIS Sec. 3.4.3 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Secs. 4.7.3.4 EIS App. F.4 EIS App. F.2 POD Att. I POD Att. DD
Soils: No more than ten percent of an activity area to be compacted, puddled or displaced upon completion of project (not including permanent roads or landings). No more than 20 percent of the area should be displaced or compacted under circumstances resulting from previous management practices, Including roads and landings Permanent recreation facilities or other permanent facilities are exempt.	P, C, R	P, B, A	EIS Sec. 1.5 EIS Sec. 2.1.3.4 EIS Sec. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Sec. 4.7.3.4 POD Att. I EIS App. F.2 LRMP Amendment RRNF-6
Soils: Landslide hazard evaluation will be used to assess potential mass wasting risk by the project. The Rogue Rover National Forest landslide, slope stability and hazard rating maps will be used to determine need for detailed slope stability mapping.	P	P, R	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 3.4.3 EIS Sec. 4.1.2.2 POD Att. I
Soils: Design management activities to return effective ground cover. The mineral soil exposure should not exceed the following limits overall, based on the erosion hazard rating of the soil type, as defined in the Rogue River National Forest Soil Resource Inventory: a. Forty percent mineral soil exposed on soils classed as very slight, slight, low or moderate erosion hazard soils; b. Thirty percent exposure on high or severe erosion hazard soils; c. Fifteen percent exposure on very high or very severe erosion hazard soils.	P	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 POD Att. I
Soils: Rehabilitate adversely impacted sites.	P, R	P, B,	EIS Sec. 1.5 EIS Secs. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Sec. 4.7.3.4 POD Att. I

TABLE 2.2-1

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Element	Applicable	Consistency	Comment
Facilities: The Access Management Objectives Process, as described m Forest Service Handbook 7709 55, will be used to develop Road Design, Road Operation, Road Maintenance, and Off-Road Travel Criteria These in turn will be used to develop. a. Road and Trail Design Elements, b. Road and Trail Design Standards, c. Road Maintenance Levels, d. Road and Trail Maintenance Plans, e. Road Traffic Management Strategies, f. Road Restriction Orders and Traffic Control Devices, g. Off-road Vehicle Management Strategies, h. Travel Maps, and i. Closure Orders.	P	P, B, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.7.2 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. Y
Facilities: Road clearing and excavation shall be designed to fit the natural patterns of form, line and texture of the landscape and meet the visual quality objective.	P	P, B	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.8.2.3 & 4.8.2.4 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. U POD Att. Y
Facilities: New helispots, rock pits, and borrow areas will meet the visual quality objective.	N		
Facilities: Existing roads and facilities that do not meet the visual quality objective shall be identified. Long term plans shall be implemented to rehabilitate these facilities.	N		
Facilities: Within sensitive soil resource Inventory land types, as shown in Management Strategy 21, the following guidelines apply. a. Geotechnical Input is required for road location, design, and management b. Temporary roads will be planned, located, surveyed, designed, constructed, and operated utilizing the same procedures for renewing, decisions, selecting design elements and standards, and controlling construction, operation, and maintenance as are used for permanent transportation system roads c. Roads which access or traverse these land types may be closed seasonally to prevent resource damage	P, C, R, O	P, B, R	EIS Secs. 2.3.2.1 - 2.3.2.3 EIS Sec. 3.4.3 EIS Sec. 4.1.2.2 EIS Sec. 4.1.3.1 EIS Sec. 4.2.3.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y
Facilities: Temporary roads that have been evaluated through the NEPA process are permitted.	P	P	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y
Facilities: Roads that are no longer needed shall be obliterated and properly drained when they are taken out of service Vegetation shall be reestablished within one year.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Protection: Plan pest control alternatives to be biologically selective, cost beneficial and to have no irreversible adverse effect on the environment.	P	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.7.3 EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Sec. 4.4.2.3 EIS Secs. 4.5.1.2 & 4.5.1.3 POD Att. I POD Att. N POD Att. X
Protection: Suppress pests when outbreaks threaten managed resources and/or users. Use methods that minimize site disturbance.	P, C, O, R	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.8 EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Sec. 4.4.2.3 EIS Secs. 4.5.1.2 & 4.5.1.3 POD Att. I POD Att. N POD Att. X
Protection: Utilize integrated Pest Management strategies to prevent unacceptable damage in visual corridors. Manual, mechanical end cultural methods are emphasized.	P, C, O, R	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.8 EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Sec. 4.4.2.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.8.2.3 POD Att. I POD Att. N POD Att. X
Protection: Provide a moderate level of fire prevention activities consisting of: public contact through the use of media and personal contact at campgrounds and dispersed recreation areas; and fire prevention signing at campgrounds, rest areas, main road junctions, information centers and local businesses.	N		
Protection: Use prescription fire to obtain the desired ecological characteristics of the area.	P, C, R, O	P, B	EIS Sec. 2.1.6 EIS Sec. 2.8 EIS Sec. 4.3.2.3 EIS Secs. 4.6.3.5 & 4.6.3.6 EIS App. F.2 EIS App. F.4 POD Att. R
Protection: Treat activity fuels to a level which meets protection standards and resource objectives in a cost-efficient manner.	P, C, R, O	P, B	EIS Sec. 4.3.2.3 EIS Secs. 4.6.3.5 EIS App. J POD Att. K POD Att. R

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Protection: Hazard reduction activities will be compatible with management area objectives.	P, C, R, O	P, B	EIS Sec. 2.1.6 EIS Sec. 2.8 EIS Sec. 4.4.2.3 EIS Secs. 4.7.3.5 & 4.7.3.6 EIS App. F.2 EIS App. F.4 POD Att. R
Protection: Design fuel breaks to meet the natural characteristics of the area.	P, R	P, B,	EIS Sec. 2.1.4 EIS Sec. 4.7.3.6 EIS App. F.2 EIS App. F.4 POD Att. K POD Att. DD
Protection: Integrate fuel break construction with vegetation management projects.	P, R	P, B,	EIS Sec. 2.1.4 EIS Sec. 4.7.3.6 EIS App. F.2 EIS App. F.4 POD Att. K POD Att. DD
Protection: Conduct prescribed burning in such a manner that it will conform to applicable provisions of the Federal Clean Air Act, Oregon Smoke Management Plan and the Rogue River National Forest Smoke Management Plan.	P, C, R, O	P, B	EIS Sec. 1.5 EIS Sec. 2.4.2.1 EIS Sec. 2.7.2 EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Sec. 4.4.2.3 EIS Secs. 4.7.3.5 & 4.7.3.6 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. R
Protection: Each wildfire will have an appropriate response in accordance with the Rogue River National Forest Fire Management Policy and Plan.	N		
Wild River 10 – Not Applicable, Excluded From Table			
Scenic River – Not Applicable, Excluded From Table			
Botanical Area 12 – Not Applicable, Excluded From Table			
Wilderness 13 – Not Applicable, Excluded From Table			
Big Game Winter Range 14			
Recreation - Roaded Modified: Manage the area for Modification Visual Qualify Objective. Blend and shape regeneration openings with the natural terrain to the extent possible. Assess the impacts to visual resources in all project environmental analysis. Specifically address how the visual quality objective will be met.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Recreation - Roaded Modified: Allow for dispersed recreation activities such as hunting, fishing and the gathering of forest products	N		
Recreation - Roaded Modified: Manage trails, motorized and nonmotorized recreation use, dispersed occupancy sites and activities to minimize conflict with wildlife management activities and winter range values.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.7.2 EIS Sec. 2.8 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.8.1.3 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. S POD Att. Y
Recreation - Roaded Modified: Allow off-road vehicle use only on designated roads and trails when it will not conflict with big game winter range values.	N		
Recreation - Roaded Modified: Identify the potential effect of any proposed activity on recreation opportunity spectrum classes In all project environmental analysts.	N		
Recreation - Roaded Modified: Control vehicle access in big game winter range as needed between November 1 and April 30 to prevent biological stress.	P, C, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.6.2 EIS Sec. 2.8 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.8.1.3 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. S POD Att. Y
Recreation - Roaded Modified: Rehabilitate deteriorated recreation use areas.	N		
Recreation - Roaded Modified: Protect Special Dispersed Features, including trails, from adverse impacts until management of the special dispersed features is addressed in an environmental analysis The environmental analysis shall propose alternative management practices and mitigation measures where appropriate	N		
Recreation - Roaded Modified: Investigate area to inventory archaeological, historical or other cultural resource properties which may be located within the proposed "area of effect" of projects or elsewhere. Document results of the investigation/ inventory in the protect environmental analysts Inventory of non-project areas will be guarded by the Forest's cultural resource Inventory strategy.	N		

TABLE 2.2-1

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Element	Applicable	Consistency	Comment
Recreation - Roaded Modified: Evaluate the cultural resources found within the area using a qualified cultural resource specialist to determine their potential archaeological, historical or cultural significance Evaluate cultural resources on a project-specific basis or by thematic/multi-resource group If a cultural resource is discovered after project activity has begun, the activity will cease or be modified until an evaluation of significance can be made.	N		
Recreation - Roaded Modified: Assess the Impacts of a proposed action to determine the effect of the project upon potentially or known significant cultural resources.	N		
Recreation - Roaded Modified: Mitigate potential adverse Impacts to sign& cant cultural resources by redesigning the project to avoid damage or disturbance, or implementing appropriate mitigation procedures to reduce the adverse impact to the resource.	N		
Recreation - Roaded Modified: Inventory and protect cultural resources to Insure that values are not damaged or destroyed until they can be evaluated for scientific study, interpretation or other appropriate uses Protection of values may include maintenance of structures, avoidance of the site, or scientific removal, analysis and reporting.	N		
Recreation - Roaded Modified: Evaluate and enhance cultural resources for scientific, educational, recreational and ethnic use to the extent the Integrity of the resource is maintained Use will be carefully monitored.	N		
Recreation - Roaded Modified: Develop and administer schedules for long-range cultural resource management Coordinate cultural resource management with appropriate State and Federal agencies.	N		
Recreation - Roaded Modified: Properties that meet the significance criteria will be treated as eligible to the National Register of Historic Places; eligible properties will be nominated to the National Register.	N		
Wilderness: This element is not applicable under a big game winter range management strategy.	N		
Wilderness: Project plans will assure that wilderness boundaries are not violated.	N		
Wildlife, Fish and Plants: Manage big game winter range habitat to provide a minimum of 50 percent thermal cover on each 500 to 1000 acres analysis area. At least two-thirds of the thermal cover (30 percent of the analysis area) should meet optimal thermal cover requirements.	P, C, R, O		EIS Sec. 3.4.2.13 EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Provide a minimum of 20 percent of each analysis area as forage area by maintaining or improving forage conditions with emphasis on increasing the variety and quality of plants available for forage and a mixture of age classes of shrubs.	P, R	P	EIS Secs. 4.5.1.2 & 4.5.1.3

TABLE 2.2-1

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Element	**Applicable**	**Consistency**	**Comment**
Wildlife, Fish and Plants: Where foraging areas are created, the units will be irregular in shape and designed so that any point in the unit is no more than 600 feet from cover. Hiding/thermal cover will be maintained immediately adjacent to the foraging site. If more than one unit is treated in a single year, the units should be at least 600 feet apart. As an opening is reestablished with trees and qualifies as cover, adjacent areas can be harvested to maintain forage producing areas.	P, R	P	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Forage improvement activities will be coordinated with State Fish and Game Departments.	P, R	P	EIS Sec. 1.5 EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Because winter range habitat is used year round by elk and deer, a restricted operating period from April 1 to June 30 may be imposed in identified fawning or calving areas.	P, C, O	P	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Allow wildlife habitat improvement projects	P, R	P,	EIS Sec. 2.1.4 EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.5.2.3 & 4.5.2.4 EIS App. F.2 POD Att. S POD Att. DD
Wildlife, Fish and Plants: Endangered, threatened and sensitive species (and species proposed for Federal listing by USDA Fish and Wildlife Service [PETS]) will be identified and managed in cooperation with the USDI Fish and Wildlife Service, Oregon Department of Fish and Wildlife, Oregon Department of Agriculture, Oregon Natural Heritage Database, and California Department of Fish and Game.	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 POD Att. J POD Att. DD
Wildlife, Fish and Plants: Legal and biological requirements for the conservation of listed and proposed endangered, threatened and sensitive plant and animal species shall be met. Habitat for existing federally-listed species shall be managed to achieve objectives of recovery plans.	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 EIS App. F.7 POD Att. J POD Att. DD

TABLE 2.2-1

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Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Biological evaluations (FSM 2672.4) shall be prepared for each project authorized, funded or conducted on the Forest. The biological evaluation shall be used to determine the possible effects the proposed activity will have on listed and PETS species. The biological evaluation consists of five steps. a. Pre-field review of existing information; b. Field reconnaissance of the project area, c. Determination of whether local populations of listed and PETS species will be affected by a project; d. Analysis of the significance of project effects on local and total populations of listed and PETS species, e. When step four cannot be completed due to lack of information, a biological or botanical investigation is conducted to gather the information needed to complete step four.	P, R	P,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 EIS App. F.7 POD Att. J POD Att. DD
Wildlife, Fish and Plants: If endangered, threatened or proposed species are found in a prefect area, consultation requirements with the USDI Fish and Wildlife Service shall be met in accordance with the Endangered Species Act (Public Law 93-205) and FSM 2671.4 No adverse Impacts on endangered, threatened or proposed species or their habitats shall occur except when It is possible to compensate adverse effects totally through alternatives identified in a biological opinion rendered by the USDI Fish and Wildlife Service (FSM 2670.31) Before a project can be carried out, protection or mitigation requirements shall be specified (NFMA, 36 CFR 219.27(a)(8)).	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 EIS App. F.7 POD Att. J POD Att. L POD Att. DD
Wildlife, Fish and Plants: If sensitive species are found in a project area, avoidance or other mitigation to minimize Impacts to local populations shall be used for those species whose viability has been identified as a concern (FSM 2670.32) Maintaining viable populations of species throughout their geographic range (FSM 2670.22) shall be an objective during project planning At a minimum, no action shall result in loss of species viability or create significant trends toward Federal listing (FSM 2670.32).	P, C, R, O	P, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Sec. 3.4.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 EIS App. F.7 POD Att. J POD Att. DD
Wildlife, Fish and Plants: Northern Spotted Owl - Manage this species under the standards and guidelines established in the ROD for the Supplement to the Environmental Impact Statement for an amendment to the Pacific Northwest Regional Guide In the event that a pair of northern spotted owls are found in an area, consideration will be given to (1) the need to improve the distribution of older forest ecosystems for all associated plant and animal species, (2) providing insight Into management of spotted owl habitat areas (SOHA) through experimental habitat manipulation During the planning and scheduling phase of a timber sale or any other project activity that may Impact spotted owl habitat, conduct a biological evaluation in order to determine the degree of Impact and to provide for protective measures.	P, C, R, O	P, R, ,	EIS Secs. 1.5 EIS Sec. 2.1.4 EIS Sec. 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS Secs. 4.7.3.4 & 4.7.3.6 EIS App. F.2 EIS App. F.3 EIS App. F.7 POD Att. DD
Wildlife, Fish and Plants: Osprey - Protect active nests during the nesting season Land management activities having adverse potential impact should not occur within a 20-chain radius of the nest from March 1 to August 31 Nest and perch trees will be protected until they are no longer usable.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3

TABLE 2.2-1

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Element	**Applicable**	**Consistency**	**Comment**
Wildlife, Fish and Plants: Goshawk – Nest sites will be protected from disturbing human activities during the nesting season. To maintain the physical suitability of nesting areas and prevent disturbances that may cause nesting failures, the period of protection will be from March 1 to August 31 for the area within 20 chains of the active nest.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Goshawk – Each nest site is assumed potentially active until June 1. If monitoring has shown that no nesting attempt has been initiated or that a nesting attempt has failed by June 1, the nest site will be considered inactive and the above nest site restriction may be waived Monitoring will be supervised and evaluated by a qualified wildlife biologist.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Goshawk – Goshawk nests will be protected within a 25 acre no-harvest buffer of trees unless other adjacent alternate buffers are available in a logical basis to maintain habitat over time.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Leave sufficient wildlife trees (hard snags or green trees designated to become snags) in coniferous forest lands to provide for at least 60 percent of the potential population levels for cavity nesting species The distribution of numbers and size class necessary to meet 60 percent per 100 acres is as follows: Siskiyou and Cascade Mixed Conifer Size Number 15+ 179 17+ 36 25+ 3 Total 218 Siskiyou and Cascade True Fir Size Number 15+ 143 17+ 11 25+ 3 Total 157	P, C, R, O	P, R,	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 POD Att. P POD Att. U POD Att. DD EIS App. F.7

TABLE 2.2-1

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Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Species distribution should be representative of the site's original stand Trees selected for retention should maximize use of the stands cull component If the proper number and size of trees do not exist in the stand to be treated, select the proper number from the next lower size class (i.e., if 25" trees are not available go to 17" trees) Material that satisfies the need for down woody material recruitment will come from existing down material, down woody material that is the result of a silvicultural treatment and from the trees that are designated to meet standing wildlife tree requirements The long-term goal for large woody material (LWM) is 10 to 20 pieces of class I and II logs per acre, and all existing class III, IV and V logs except for incidental amounts removed during management activities Additional green merchantable trees will not be designated unless none of the other categories exist The expected life span of snags or dead trees in mixed conifer working groups is 30 years and in true for working groups the life span is 20 years The silvicultural prescription will describe the total number, size and species of wildlife trees that will be required through the next full rotation of the stand being treated Wildlife and down woody material requirement will be included as part of the vegetative (silvicultural) prescription for each stand information for the prescription will be provided by a wildlife biologist based on site by site needs A certified silviculturist will validate the data and include It in the preparation of the final vegetative (silvicultural) prescription that implements all the interdisciplinary requirements The logging system required, reforestation needs, slash disposal requirements and site preparation needs should be compatible with the wildlife tree distribution needs. Primary cavity excavator habitat will be met on areas no larger than 60 acres Including adjacent harvest units The Intent being to provide well distributed habitat and allow adjacent stands to provide the needed wildlife trees for past harvest units where the adjacent stands plus harvest units do not exceed 60 acres Where past harvest units were very large, the adjacent stands within 900 feet would be managed at higher wildlife tree levels to bring the overall area to the 40 percent level When the past harvest units were of such magnitude that the above methods cannot bring the entire area to the 40 percent level, the remaining shortage will not be provided for, but will be recorded and tracked for purposes of monitoring the forest plan Selection of wildlife trees to make up for past deficits will meet the same selection criteria as in newly treated stands Green merchantable trees will not be girdled to create wildlife snags, regardless of the situation, until (5-7) years after project completion (sale closure), in order to capture any mortality that may occur during that time.	P, C, O, R	P, B,	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 POD Att. P POD Att. U POD Att. DD EIS App. F.7

TABLE 2.2-1

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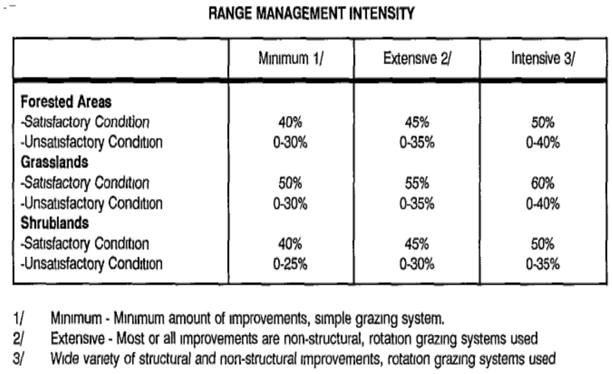
Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Bald Eagle - Develop a bald eagle site management plan for each nesting or roosting area as It is discovered Until a site specific management plan is developed, the following measures will apply Establish the primary nesting zone to be a 330 foot radius around the nest and the secondary zone to be a 660 foot radius around the nest The following activities should not occur within the nesting zones and communal roosting sates 1) Primary Zone All human related activities unless the activities pre-existed to nest discovery and the eagles are apparently tolerant, 2) Secondary Zone - Major land uses such as development of commercial and industrial sites, home, road, powerline or other construction, oil drilling, surface mining, and spraying of chemicals which adversely affect eagles. Timber cutting to enhance habitat is permitted but there is no scheduled timber harvest, 3) Primary and Secondary Zones between January 1 and August 15 - blasting, use of firearms, camping, picnicking, timber harvest, road and water access Into the nesting territory, and low level aircraft operations with helicopters no closer than 1,000 feet and with fixed wing no closer than 500 feet, 4) A communal roost is any stand of trees m which eagles regularly roost together. The primary zone for roosting eagles is 330 feet from the roosting trees and the secondary zone is one-quarter of a mile from the roosting trees. Large trees used as solitary roosts should be left along shoreline of lakes and streams wherever possible Biological evaluation and informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4
Wildlife, Fish and Plants: Peregrine Falcon - Develop a Peregrine falcon site management plan for each nesting area found The site plan design will be tailored to fit the landscape and the use patterns established by the birds. The following may be included in the Plan. 1) Delineate the nest site (eyrie), 2) Define primary (nesting) and secondary and tertiary zones associated with the eyrie, 3) Withdraw the nest site from mineral entry, 4) Restrict management activities and recreational use to September through January: 5) Allow no structural developments within the primary zone unless It benefits the species; 6) Maintain and/or enhance riparian habitats within a three-mile radius of the eyrie, 7) Develop water sources (springs, seeps, ponds, catchments) within approximately one-half mile radius of the eyrie, 8) Implement silvicultural prescriptions, prescribed fire or other management techniques to maintain a mosaic of all vegetative serial stages within the secondary and ternary zones (approximately a three-mile radius of the eyrie); 9) Direct special emphases towards maintaining and/or enhancing mast- and berry-producing shrubs and trees which support jays, bandtail pigeon and other passerine birds. Biological evaluation and Informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 EIS App. F.2
Range: Permit livestock grazing as long as sufficient forage is left for wildlife during the winter season.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Range: Provide annual permittee plans for livestock distribution and use patterns Where conflicts cannot be resolved or mitigated, relocation or removal of livestock will be considered.	N		
Range: Write range allotment plans to reflect management direction for all lands within the allotment boundary Allotment planning procedures are documented m FSM 2210.	N		
Range: Develop Coordinated Resource Management Plans where possible and feasible to facilitate the integrated resource management of range and other resources, and between agencies, permittees and other landowners.	N		
Range: Design range improvements complimentary to elk winter range management.	N		
Range: Allow increases in permitted grazing use to capture increases in transitory range caused by timber cutting compatible with winter range management objectives.	N		
Range: Prescribe kind and amount of grass and browse seeding in silviculture prescriptions.	N		
Range: Permit grazing on disturbed sites and/or areas under timber management which can be seeded with species to improve forage production and does not restrict tree establishment and growth. (FSM 2521.02, RR Supplement #6, 2/73).	N		
Range: Forage utilization standards will be incorporated in allotment management plans. Allotment management plans may include utilization standards which are lower or rarely higher when associated with intensive grazing systems and specific vegetation management objectives which will meet resource management objectives and the intent of the management strategy. The standards include cumulative annual use by big game and Livestock. Utilization for grass and grass-like species is based on the percent of plant weight removed. Utilization for shrub species is based on incidence of use, weight, and/or twig length (e.g. utilization is 50 percent if 50 out of 100 leaders are browsed). Satisfactory condition is determined by allotment classification and/or forage condition. Unsatisfactory condition is anything not meeting satisfactory conditions. Allowable use of available forage (Maximum percent of annual utilization by big game and livestock) IS:	N		
	N		

RANGE MANAGEMENT INTENSITY

	Minimum 1/	Extensive 2/	Intensive 3/
Forested Areas			
-Satisfactory Condition	40%	45%	50%
-Unsatisfactory Condition	0-30%	0-35%	0-40%
Grasslands			
-Satisfactory Condition	50%	55%	60%
-Unsatisfactory Condition	0-30%	0-35%	0-40%
Shrublands			
-Satisfactory Condition	40%	45%	50%
-Unsatisfactory Condition	0-25%	0-30%	0-35%

1/ Minimum - Minimum amount of improvements, simple grazing system.
2/ Extensive - Most or all improvements are non-structural, rotation grazing systems used
3/ Wide variety of structural and non-structural improvements, rotation grazing systems used

TABLE 2.2-1

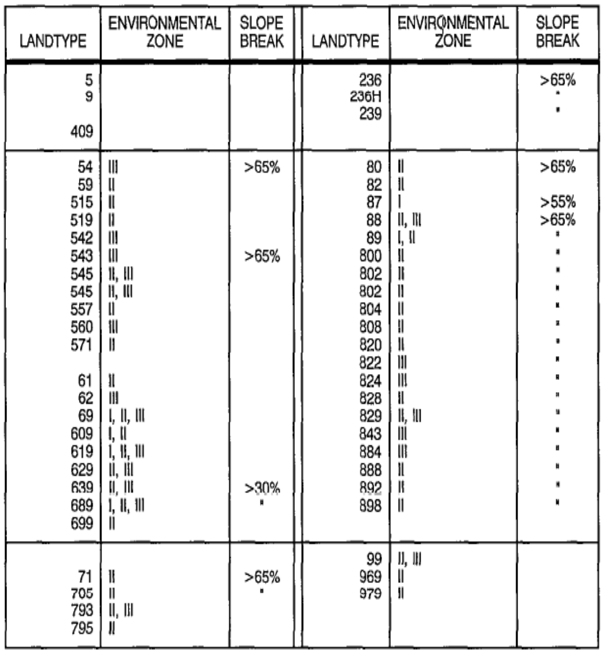
Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Timber harvest will be scheduled.	N		
Timber: When trees are cut for timber production objectives, the cutting shall be made in a way to assure that technology and knowledge exist to adequately restock the site within five years after final harvest (36 CFR 219 27(c)(3)).	N		
Timber: Timber harvesting shall only occur on lands classified as suitable for timber production except for salvage sales, sales necessary to protect other multiple-use values or activities that meet other objectives d the Forest Plan establishes that such actions are appropriate (36 CFR 219 27(c)(l)).	N		
Timber: Treat timber stands to achieve desired visual characteristics through the following practices. a. Site preparation - chemical, mechanical, biological and manual and prescribed fire; b. Tree improvement (genetics); c. Reforestation by planting Random natural seeding will count towards reaching desired stocking; d. Growing stock protection from animals, insects and diseases; e. Release and weeding - chemical, mechanical, biological and manual and prescribed fire; f. Precommercial thinning; g. Fertilization; h. Commercial thinning; i. Salvage mortality as necessary; j. Final Harvest - even-aged silvicultural system using shelterwood, seed tree or clearcut methods The shelterwood method will probably be the most common, however, selection will be determined by the environmental assessment process and documented in a site-specific silvicultural prescription.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
<u>Timber:</u> Opening size and stocking levels need to be restricted on the sensitive land types shown in the following table.	N		



LANDTYPE	ENVIRONMENTAL ZONE	SLOPE BREAK	LANDTYPE	ENVIRONMENTAL ZONE	SLOPE BREAK
5			236		>65%
9			236H		"
			239		"
409					
54	III	>65%	80	II	>65%
59	II		82	II	
515	II		87	I	>55%
519	II		88	II, III	>65%
542	III		89	I, II	"
543	III	>65%	800	II	"
545	II, III		802	II	"
545	II, III		802	II	"
557	II		804	II	"
560	III		808	II	"
571	II		820	II	"
			822	III	"
61	II		824	III	"
62	III		828	II	"
69	I, II, III		829	II, III	"
609	I, II		843	III	"
619	I, II, III		884	III	"
629	II, III		888	II	"
639	II, III	>30%	892	II	"
689	I, II, III	"	898	II	"
699	II				
			99	II, III	
71	II	>65%	969	II	
705	II	"	979	II	
793	II, III				
795	II				

Element	**Applicable**	**Consistency**	**Comment**
<u>Timber:</u> Logging unit size for regeneration and vegetation management for sate conversion treatments, normally will not exceed 15 acres and no more than 30 percent of the sensitive area will be treated. Openings and percent of area treated will be distributed relative to the stability characteristics of the landscape. Adjacent lands in sensitive sites can be reentered when (1) minimum stocking for the site reaches 12 feet in height, or (2) 70 percent of ground is covered with trees and brush 12 feet in height. Deviations will be supported with a fully documents environmental analysis. Precommercial stand maintenance and precommercial thinning is not subject to the limitations shown in (1) and (2) above.	N		
<u>Timber:</u> For commercial intermediate treatments, stocking may be reduced to minimum stocking level for the site or 50 percent of existing level, whichever is greater Deviations will be supported with a fully documented environmental analysis.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Opening size limitations for other land types not shown above are as follows. a. Where stand conditions permit, the size of created openings will be between 30 and 60 acres. b. Limit created openings with tree sizes of less than 4 5 feet tall to a maximum of 17 percent of the area Exceptions are permitted when natural catastrophic situations such as fires, windstorms, or Insect and disease attacks occur. c. A harvested area of commercial forest will no longer be considered a created opening for silvicultural purposes when stocking surveys carried out in accordance with Regional instructions indicate prescribed crop tree stocking at or above 4 5 feet in height and free to grow.	N		
Timber: Rehabilitate and reconstruct developments and resources that have been Impacted by timber sale activities.	N		
Timber: Reforestation, precommercial thinning and release to meet recommended stocking will be addressed with site specific silvicultural perceptions.	N		
Timber: The logging system design for umber sales will be reviewed by logging systems specialists designated by the Forest Supervisor Review for feasibility, silvicultural compatibility and economics.	N		
Timber: The even-aged silvicultural system will be the most commonly used system m coniferous forests. The uneven-aged silvicultural system may be used when healthy, fully stocked, uneven-aged stands exist or can be created by identified treatments within a defined time period The selection of the appropriate silvicultural system will be guided by the following criteria. a. Must permit the production of sufficient volume of marketable trees to permit utilization of all trees which meet utilization standards and are designated for harvest. b. Must permit the use of an available and acceptable logging method. c. Must be capable of providing special conditions when required by critical soil conditions or needed to achieve management objectives. d. Must permit control of existing or potential vegetation to a degree that establishment of numbers of trees and rates of growth as identified In site-specific silvicultural prescriptions for harvest areas can be achieved. e. Must promote stand structure and species composition which avoids serious risk of damage from mammals, Insects, disease or wildfire and will allow treatment of existing Insect, disease or fuel conditions. f. Must meet resource and vegetation management objectives.	N		
Timber: Set harvest treatment priorities by cut categories on each District so that the stands most needing treatment are done first, wherever reasonably possible.	N		
Timber: Coordinate chemical and fertilizer use with the Oregon Department of Fish and Wildlife and California Department of Fish and Game.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Design and schedule timber sales to accomplish forage and thermal cover ratio specified under “Wildlife, Fish And Plants” of this management strategy.	N		
Timber: Create forage units that are irregular in shape and design so that any point is no more than 600 feet from cover. Maintain hiding cover immediately adjacent to the forage site.	N		
Timber: Slash shall be managed to facilitate big game movement and forage production.	N		
Timber: Firewood gathering will be coordinated with winter road closures and season restrictions will apply during the winter and spring. Firewood gathering will be allowed in conjunction with timber management activities or in designated fuelwood gathering areas.	N		
Timber: Maintain a blend of tree species approximating natural stands In seed collections, no seed lot shall be represented by fewer than 15 families of trees of that species well distributed across the breeding zone In addition, no family of parent trees shall represent greater than 20 percent of a seed lot Although any given plantation may be planted to a single species, strive for a natural seed source from a variety of species.	N		
Timber: Make miscellaneous forest products such as poles, posts, boughs, Christmas trees, house logs, etc., available on an as needed basis consistent with the resource objectives of this management area.	N		
Timber: Provide access to potential fuelwood when appropriate Bring fuelwood to convenient points in timber sale or thinning areas Utilize appropriate timber sale clauses or modify fuels management prescriptions to meet this objective.	N		
Timber: Allow commercial fuelwood contracts for slash disposal, thinning and site preparation.	N		
Timber: Open slash areas to fuelwood gathering prior to traditional disposal methods.	N		
Timber: Leave slash as a fuelwood source where there is no conflict with resource activity.	N		
Timber: Consider using the fuelwood program as a means to meet silvicultural objectives in appropriate areas, such as low productivity stands or other stands prior to reaching commercial size.	N		
Timber: Consider the season of year and access when implementing a fuelwood program. The public will be encouraged to burn dry wood.	N		
Timber: Document fuelwood availability for public uses in project environmental analysis.	N		
Timber: Be responsive to the needs of the public for fuelwood.	N		
Timber: Create a Forest fuelwood and miscellaneous products policy to include fuelwood Inventory.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

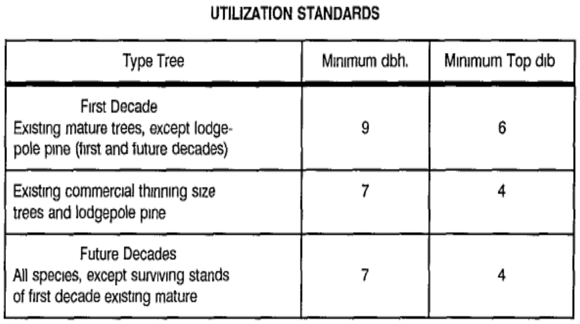
<table>
<tr><th>Element</th><th>Applicable</th><th>Consistency</th><th>Comment</th></tr>
<tr><td>Timber: Utilization standards for timber harvested will meet the standards as stated in the Pacific Northwest Regional Guide, Standards and Guidelines 4-2 and in Table 3-6. Standards in timber sale contracts may vary depending on markets and costs of harvesting.</td><td>N</td><td></td><td></td></tr>
<tr><td>
UTILIZATION STANDARDS
<table>
<tr><th>Type Tree</th><th>Minimum dbh.</th><th>Minimum Top dib</th></tr>
<tr><td>First Decade
Existing mature trees, except lodgepole pine (first and future decades)</td><td>9</td><td>6</td></tr>
<tr><td>Existing commercial thinning size trees and lodgepole pine</td><td>7</td><td>4</td></tr>
<tr><td>Future Decades
All species, except surviving stands of first decade existing mature</td><td>7</td><td>4</td></tr>
</table></td><td>N</td><td></td><td></td></tr>
<tr><td>Water: Evaluate effects of proposed projects on stream courses In all environmental analysis discuss pertinent stream classification and recommend changes where appropriate as a result of the environmental analysis.</td><td>P</td><td>P</td><td>EIS Sec. 2.4.2.2
EIS Sec. 4.3.2.2
EIS Secs. 4.3.4.1 & 4.3.4.3
EIS Sec. 4.7.3.5
EIS App. F.4
POD Att. I
POD Att. CC</td></tr>
<tr><td>Water: Comply with State requirements in accordance with the Clean Water Act of 1972, as amended (1977 and 1987) for protection of waters of the State of Oregon (Oregon Administrative Rules, Chapter 340-41), and the State of California (Porter-Cologne Water Quality Control Act, Division 7) through planning, application, and monitoring of Best Management Practices (BMPs) in conformance with the Clean Water Act of 1972, as amended (1977 and 1987), regulations, and federal guidance issued thereto.</td><td>P, C, R, O</td><td>P, B</td><td>EIS Secs. 1.4
EIS Sec. 1.5
EIS Secs. 2.4.2.1 & 2.4.2.2
EIS Secs. 2.7.1 & 2.7.2
EIS Secs. 4.3.2.2 & 4.3.3.2
EIS Secs. 4.3.4.1 & 4.3.4.3
EIS Sec. 4.7.3.5
EIS App. F.4
POD Att. I
POD Att. M
POD Att. BB</td></tr>
</table>

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Water: In cooperation with the States of Oregon and California, the Forest will use the following process. a. Select and design BMPs based on site specific conditions, technical, economic, and institutional feasibility, and water quality standards for those waters potentially impacted, b. Implement and enforce BMPs; c. Monitor to insure that practices are correctly applied as designed: d. Monitor to determent the effectiveness of practices in meeting design expectations and in attaining water quality standards: e. Evaluate monitoring results and mitigate where necessary to minimize impacts from activities where BMPs do not perform as expected: f. Adjust BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level Evaluate the appropriateness of water quaky criteria for reasonably assuming protection of beneficial uses. Consider recommending adjustment of water quality standards, g. Use the existing agreed to process to Implement the State Water Quality Management Plan on lands administered by the USFS as described In Memorandums of Understanding between. 1) the Oregon Department of Environmental Quality and US. Department of Agriculture, Forest Service (Z/12/79 and 12/7/82), and “Attachments A and 8’ referred to In this MOU (Implementation Plan for Water Quality Planning on National Forest lands in the Pacific Northwest 12/78 and Best Management Practices for Range and Grazing Activities on Federal lands) and 2) the State Water Resources Control Board, State of California, and U.S. Department of Agriculture Forest Service, Pacific Southwest Region, 1981.	P, C, R, O	P, B	EIS Sec. 1.5 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.7.1 & 2.7.2 EIS Secs. 4.3.2.2 & 4.3.3.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.7.3.5 EIS App. F.4 POD Att. I POD Att. M POD Att. CC
Water: The following requirements will be employed in protect implementation when proposed projects may affect streams. a. Determine restricted distance from streams for equipment operation, type of stream crossing, if crossing is needed, and erosion control methods, if needed, b. Consider relation of protect to riparian strategy areas (all streams classed as I, II and III are allocated to Strategy 26), c. Locate springs that may be affected and evaluate for appropriate levels of protection. This would usually require consultation with soil, water or geology specialists, d. In project planning, consider basin constraint percentages by subwatershed as identified in the monitoring play for watersheds.	P, R	P, B, R, ,	EIS Sec. 2.1.4 EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.7.2 EIS Sec. 4.1.2.5 EIS Secs. 4.3.1.2, 4.3.2.2 & 4.3.3.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. C POD Att. I POD Att. W POD Att. X POD Att. BB POD Att. DD
Water: Acquire water rights for development of non-reserved uses.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Water: Design project water monitoring as appropriate.	P	P, B	EIS Secs. 2.3.2.1 & 2.1.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.7.1 & 2.7.2 POD Att. I POD Att. M POD Att. CC
Water: Allow for watershed restoration projects.	P, R	P,	EIS Sec. 2.1.4 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. DD
Water: In-stream flows on National Forest lands should be protected through critical analysis of proposed water uses, diversion and transmission applications and renewal of permits.	N		
Water: Insure that proposed projects have no adverse effects on snow survey sates included in the Regional Forester's memorandum of understanding with the Soil Conservation Service.	N		
Water: Comply with the specific direction for management of each of the municipal watersheds as specified in management agreements between the U.S. Department of Agriculture or Forest and municipalities.	N		
Minerals: Develop and manage new and existing aggregate sources in compliance with approved Rock Resource Development Plan and an approved environmental analysis.	N		
Minerals: Under mining laws, claimants are entitled to access to their mining claims Access for exploration and development of locatable mineral resources will be analyzed in response to a proposed operating plan A decision on approval of reasonable access will be made as a result of appropriate environmental analyses.	N		
Minerals: Operating plans for mining operations will be processed In a timely manner in accordance with 36 CFR 228.	N		
Minerals: In plans of operation, require operationally feasible provisions designed to' protect riparian and fishery values, meet State water quality standards: and Insure that disturbed areas are reclaimed Insofar as practicable to a practicable condition.	N		
Minerals: Reclamation plans will Identify management objectives for disturbed areas and detail the procedures and time frames necessary to accomplish the objectives Reclamation bonds will be based on actual reclamation costs and formulated using technical and other resource Input.	N		
Human And Community Development: Conduct compliance reviews as required by Title VI of the Civil Rights Act of 1964, and established Forest Service standards.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Human And Community Development: Inform the general public, including minorities and the underprivileged. of availability and benefits which they are eligible to receive from Forest programs. Techniques to Increase awareness and participation will be used.	N		
Human And Community Development: As directed by the American Indian Religious Freedom Act, the Forest will protect and preserve for Native Americans their inherent right of freedom to believe, express and exercise their traditional religions on Forest lands This includes, but is not limited to, access to ceremonial sites, use and possession of sacred objects, and the freedom to worship through traditional ceremonies and rites.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities compatible with interests of surrounding Indian tribes.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities with the Interest of adjacent communities.	N		
Lands: Revise all special use permits to be constant with the direction in this management strategy when renewed.	N		
Lands: Utilize residual capacity in existing utility condors when applications for rights-of-ways from public or private entities are received Analyze any additional corridors with an environmental analysis.	N		
Lands: Direct applications for electronic sates toward use of sates in the following order. a. Utilizing residual capacity of existing Sates b. Develop new sates identified in the Forest-wade Electronic Site Plan	N		
Lands: Insure that proposed projects do not have adverse effect on lands included in active exchanges.	N		
Lands: Develop rights-of-ways as necessary to implement projects.	P, C, R, O	P, B, R,	EIS Sec. 1.4 EIS Sec. 1.5 EIS Sec. 2.1.6 EIS Sec. 2.3.2.3 EIS Sec. 3.4.3 EIS Sec. 4.7.3.4 POD Att. I POD Att. U POD Att. Y POD Att. BB
Lands: Proposed projects are responsible for distinguishing boundaries between management areas with differing management objectives.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. U POD Att. 21
Lands: Establish and maintain property boundaries on lands administered by the Forest Service.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. U POD Att. T

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Soils: Address the potential for detrimental soil displacement, compaction, puddling, severe burning, mass wasting and surface soil erosion in project environmental analysis.	P	P, B,	EIS Sec. 1.5 EIS Sec. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Sec. 4.7.3.4 POD Att. I
Soils: Alternative management practices will be developed or mitigating measures planned and Implemented when activities are likely to result m detrimental displacement, compaction, mass wasting or erosion.	P, R	P, B, ,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Sec. 3.4.3 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Secs. 4.7.3.4 EIS App. F.2 POD Att. I POD Att. DD
Soils: No more than ten percent of an activity area to be compacted, puddled or displaced upon completion of project (not including permanent roads or landings). No more than 20 percent of the area should be displaced or compacted under circumstances resulting from previous management practices, Including roads and landings Permanent recreation facilities or other permanent facilities are exempt.	P, C, R	P, B, A	EIS Sec. 1.5 EIS Sec. 2.1.3.4 EIS Sec. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Sec. 4.7.3.4 POD Att. I EIS App. F.2 LRMP Amendment RRNF-6
Soils: Landslide hazard evaluation will be used to assess potential mass wasting risk by the project. The Rogue Rover National Forest landslide, slope stability and hazard rating maps will be used to determine need for detailed slope stability mapping.	P	P, R	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 3.4.3 EIS Sec. 4.1.2.2 POD Att. I
Soils: Design management activities to return effective ground cover. The mineral soil exposure should not exceed the following limits overall, based on the erosion hazard rating of the soil type, as defined in the Rogue River National Forest Soil Resource Inventory: a. Forty percent mineral soil exposed on soils classed as very slight, slight, low or moderate erosion hazard soils; b. Thirty percent exposure on high or severe erosion hazard soils; c. Fifteen percent exposure on very high or very severe erosion hazard soils.	P	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 POD Att. I
Soils: Rehabilitate adversely impacted sites.	P, R	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 POD Att. I

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Facilities: The Access Management Objectives Process, as described m Forest Service Handbook 7709 55, will be used to develop Road Design, Road Operation, Road Maintenance, and Off-Road Travel Criteria These in turn will be used to develop. a. Road and Trawl Design Elements, b. Road and Trawl Design Standards, c. Road Maintenance Levels, d. Road and Trail Maintenance Plans, e. Road Traffic Management Strategies, f. Road Restriction Orders and Traffic Control Devices, g. Off-road Vehicle Management Strategies, h. Travel Maps, and i. Closure Orders.	N		
Facilities: Between the end of the big game hunting seasons (approximately November 1 and April 30), the following Road Traffic Management Strategies will be utilized to limit the number of roads open to vehicle traffic to approximately l-1/2 miles per square mile of land. a. Encourage or accept use of arterial and collector roads. b. Accept use of local roads necessary for operating active timber sales or for current year spring access for site preparation and reforestation activities. c. Discourage, eliminate or prohibit all other use of local roads. d. Allow off-road vehicle use only on designated roads and trails when It will not conflict with winter range values.	P, C, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.7.2 EIS Sec. 2.8.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. S POD Att. Y
Facilities: Within sensitive soil resource Inventory land types, as shown in Management Strategy 21, the following guidelines apply. a. Geotechnical Input is required for road location, design, and management. b. Temporary roads will be planned, located, surveyed, designed, constructed, and operated utilizing the same procedures for renewing, decisions, selecting design elements and standards, and controlling construction, operation, and maintenance as are used for permanent transportation system roads. c. Roads which access or traverse these land types may be closed seasonally to prevent resource damage.	N		
Facilities: Temporary roads that have been evaluated through the NEPA process are permitted.	P	P	EIS Sec. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Facilities: Roads that are no longer needed shall be obliterated and properly drained when they are taken out of service Vegetation shall be reestablished within one year.	P, R	P, B,	EIS Sec. 2.1.4 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. Y POD Att. DD
Protection: Plan pest control alternatives to be biologically selective, cost beneficial and to have no irreversible adverse effect on the environment.	N		
Protection: Aggressively suppress insects and diseases using the most cost-effective suppression strategies when outbreaks threaten resource management objectives Includes stump treatment for root rots, application of pesticides for defoliators and cone insects, etc., as necessary.	N		
Protection: Practice high intensity prevention activities such as monitoring pest populations to be forewarned of outbreaks, stump removal for root rots, stocking control, species selection for plantings, timely salvage of weather damaged timber, etc.	N		
Protection: Provide a moderate level of fire prevention activities consisting of: public contact through the use of media and personal contact at campgrounds and dispersed recreation areas; and fire prevention signing at campgrounds, rest areas, main road junctions, information centers and local businesses.	N		
Protection: Maintain natural fuel loadings at a level which meets protection standards and resource objectives in a cost-efficient manner.	N		
Protection: Treat activity fuels to a level which meets protection standards and resource objectives in a cost-efficient manner.	N		
Protection: Hazard reduction activities will be compatible with management area objectives.	N		
Protection: Design fuel breaks to meet the natural characteristics of the area.	N		
Protection: Integrate fuel break construction with vegetation management projects.	N		
Protection: Conduct prescribed burning in such a manner that it will conform to applicable provisions of the Federal Clean Air Act, Oregon Smoke Management Plan and the Rogue River National Forest Smoke Management Plan.	N		
Protection: Each wildfire will have an appropriate response in accordance with the Rogue River National Forest Fire Management Policy and Plan.	N		
Old Growth 15			
Not Applicable, Excluded From Table			

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Mature Habitat 16			
Not Applicable, Excluded From Table			
Primary Range 17			
Not Applicable, Excluded From Table			
Secondary Range 18			
Not Applicable, Excluded From Table			
Spotted Owl Habitat 19			
Recreation - Semi-Primitive Motorized: Manage the area for Modification Visual Quality Objective.	N		
Recreation - Semi-Primitive Motorized: Allow for dispersed recreation activities such as hunting, hiking and the gathering of forest products.	N		
Recreation - Semi-Primitive Motorized: Manage trails and dispersed occupancy sites in a manner not in conflict with range management activities and forage resource values.	N		
Recreation - Semi-Primitive Motorized: Discourage or prohibit recreation use where public safety is threatened.	N		
Recreation - Semi-Primitive Motorized: Identify the potential effect of any proposed activity on recreation opportunity spectrum classes in all project environmental analysis.	N		
Recreation - Semi-Primitive Motorized: Off-road vehicle recreation use allowed only on designated roads and trails.	N		
Recreation - Semi-Primitive Motorized: Rehabilitate deteriorated recreation use areas.	N		
Recreation - Semi-Primitive Motorized: Protect Special Dispersed Features, including trails, from adverse impacts until management of the special dispersed features is addressed in an environmental analysis. The environmental analysis shall propose alternative management practices and mitigation measures where appropriate.	N		
Recreation - Semi-Primitive Motorized: Investigate area to inventory archaeological, historical or other cultural resource properties which may be located within the proposed "area of effect" of projects or elsewhere. Document results of the investigation/ inventory in the project environmental analysis. Inventory of non-project areas will be guided by the Forest's cultural resource inventory strategy.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Recreation - Semi-Primitive Motorized: Evaluate the cultural resources found within the area using a qualified cultural resource specialist to determine their potential archaeological, historical or cultural significance Evaluate cultural resources on a project-specific basis or by thematic/multi-resource group. If a cultural resource is discovered after project activity has begun, the activity will cease or be modified until an evaluation of significance can be made.	N		
Recreation - Semi-Primitive Motorized: Assess the impacts of a proposed action to determine the effect of the project upon potentially or known significant cultural resources.	N		
Recreation - Semi-Primitive Motorized: Mitigate potential adverse impacts to significant cultural resources by redesigning the project to avoid damage or disturbance, or implementing appropriate mitigation procedures to reduce the adverse impact to the property.	N		
Recreation - Semi-Primitive Motorized: Inventory and protect cultural resources to Insure that values are not damaged or destroyed until they can be evaluated for scientific study, interpretation or other appropriate uses Protection of values may include maintenance of structures, avoidance of the site, or scientific removal, analysis and reporting.	N		
Recreation - Semi-Primitive Motorized: Evaluate and enhance cultural resources for scientific, educational, recreational and ethnic use to the extent the Integrity of the resource is maintained Use will be carefully monitored.	N		
Recreation - Semi-Primitive Motorized: Develop and administer schedules for long-range cultural resource management Coordinate cultural resource management with appropriate State and Federal agencies.	N		
Recreation - Semi-Primitive Motorized: Properties that meet the significance criteria will be treated as eligible to the National Register of Historic Places; eligible properties will be nominated to the National Register.	N		
Wilderness: This element is not applicable under an spotted owl habitat management strategy.	N		
Wilderness: Project plans will assure that Wilderness boundaries are not violated.	N		
Wildlife, Fish and Plants: Northern Spotted owl - Amount of suitable habitat - The intent is to insure that breeding pairs in areas designed for spotted owls have sufficient habitat within their home ranges to meet overall life needs for survival and successful reproduction. The amounts of suitable spotted owl habitat at each designated habitat area will vary by physiographic province. The acreages should occur in at least one 300-acre stand of habitat that includes the nest site. Other habitats within 1.5 miles of the nest site should be as contiguous as possible. The following amounts of suitable spotted owl habitat designated per site are: 1,500 acres within 1.5 miles of nest site in the Cascade Mountains and 1,000 acres within 1.5 miles of nest site in the Siskiyou Mountains. Habitat areas may vary from the acreage objective if approved by the Regional Forester. A habitat area may be larger than the acreage	P, C, R, O	P, R,	EIS Secs. 1.5 EIS Sec. 2.1.4 EIS Sec. 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS Secs. 4.7.3.4 & 4.7.3.6 EIS App. F.2 EIS App. F.3 EIS App. F.7 POD Att. DD

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
objective for a suitable habitat, if it meets at least one of the following two criteria: 1) the area contains more than one breeding pair of spotted owls, and it has been demonstrated that the reproductive rate, on average over time, has exceeded that necessary to replace the breeding adults; and 2) the area is a key link in the network. A key link is defined as a spotted owl habitat area which, if not designated, would result in a separation of the network contrary to spacing guidelines. Key links should be larger than the spotted owl habitat area acreage objective, especially where the local landscape contains little spotted owl habitat in lands unsuitable for timber production or in reserved lands, and where the general forest landscape is heavily fragmented. Designated spotted owl habitat areas may contain less than the acreage objective for habitat where: 1) Breeding success within the previous two years has been documented and the amount and quality of spotted owl habitat has not declined significantly within the pair's home range during the previous two years; 2) The habitat area is necessary to meet spacing requirements and less than the suitable habitat acreage objective exists; 3) In addition, if acreage of suitable habitat is less than 1,000 acres and meets one of the above criteria, potential habitat that will bring the total existing and potential habitat to 1,000 acres shall be added.			
Wildlife, Fish and Plants: Northern Spotted owl - Spacing of designated habitat areas - The intent is to insure that reproductive individuals are well distributed so they can interact with others in the planning area (the regional population). The ability to interact provides for recolonization of unoccupied habitats, interchange of genetic resources, and resilience of populations to normal fluctuations in births and deaths. Distances between habitat areas within clusters of three or more spotted owl habitat areas shall be not more than 1.5 miles measures edge to edge. Distances between clusters of three or more spotted owl habitat areas or between habitats in land unsuitable for timber production that can support at least three pairs, shall be not more than 12 miles measured edge to edge. Distances between all other habitat areas (cluster, single, or habitat area within land unsuitable for timber that could support at least one pair) shall be not more than six miles measured edge to edge. Distances between spotted owl habitat areas may be extended 20 percent (that is, up to 7.2 miles for singles and 14.4 miles for clusters). This variation applies only where needed to locate a habitat area at a site with higher level of spotted owl occupancy (i.e., contains pair, rather than single bird) than would be otherwise available. Each designated habitat area should link to at least three other areas within the spacing standards. These three other areas can be other designated spotted owl habitat areas, or suitable spotted owl habitat in lands unsuitable for timber production. A cluster is not considered to be three distinct areas for the purpose of this positioning. Spacing standards apply across boundaries of adjacent National Forests. National Forests adjacent to other ownerships having suitable spotted owl habitat that will be maintained over time should provide habitats to help insure distribution across ownership boundaries; and, as far as practicable, coordinate their efforts to identify and designate habitat areas. In this regard, other ownerships include, but are not restricted to, USDI Bureau of Land Management and USDI National Park Service.	P, C, R, O	P, R, ,	EIS Secs. 1.5 EIS Sec. 2.1.4 EIS Sec. 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS Secs. 4.7.3.4 & 4.7.3.6 EIS App. F.2 EIS App. F.3 EIS App. F.7 POD Att. DD

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Wildlife, Fish and Plants: Northern Spotted owl - Threatened and Endangered Species - No spotted owl habitat management activity shall adversely affect Federally-listed threatened or endangered species or their habitats.	P, C, R, O	P, B, R, ,	EIS Secs. 1.5 EIS Sec. 2.1.4 EIS Sec. 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS Sec. 4.7.3.4 EIS App. F.2 EIS App. F.7 POD Att. DD
Wildlife, Fish and Plants: Northern Spotted owl - Identification of suitable habitat – The intent is to provide consistency and accuracy in identifying forest stand conditions that constitute suitable habitat for spotted owls. Its principal application will be in inventory, mapping and monitoring to assure that the right kinds of habitat are being designated or counted as appropriate.	P	P	EIS Secs. 1.5 EIS Sec. 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7
Wildlife, Fish and Plants: Northern Spotted owl - Vegetation types - Vegetation types in which spotted owl habitat occurs are: • Spruce/Cedar/Hemlock Forest • Cedar/Hemlock/Douglas-fir • Mixed Conifer Forest • California Mixed Evergreen Forest • Silver fir/Douglas-fir Forest • Red fir Forest • Ponderosa Shrub Forest with • White fir/Grand fir • Fir/Hemlock Forest • Grand fir/Douglas-fir Forest • Douglas-fir Forest	P	P	EIS Secs. 1.5 EIS Sec. 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7
Wildlife, Fish and Plants: Northern Spotted owl - Stand structures - The following structural characteristics identify forest stands suitable for spotted owls. These conditions occur at different ages for each vegetation type and location; but, in general, they occur in stands considered to be mature and old-growth: 1) Relatively large diameter of dominant trees in the stand; 2) Multi-layered canopy of trees with a moderate to high canopy closure in overstory, mid-story and understory layers; 3) Large, tall trees with cavities, broken tops, mistletoe, or platforms of branches capable of holding accumulated organic matter suitable for nesting; 4) Dead standing trees and fallen decayed trees to support abundant populations of prey species, especially northern flying squirrel and woodrat; 5) Stands with the above conditions and larger than 60 acres in area.	P	P	EIS Secs. 1.5 EIS Sec. 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7
Wildlife, Fish and Plants: Northern Spotted owl - The Forest will specify the inventory and mapping criteria used to identify suitable spotted owl habitat in Forest planning, subject to approval by the Regional Forester.	P	P, B	EIS Secs. 1.5 EIS Sec. 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Northern Spotted owl - Suitable habitat (vegetation types and structural or developmental stages) shall be identified in the Forest Plan for inventory, mapping and monitoring purposes in accordance with the general description above.	P	P	EIS Secs. 1.5 EIS Sec. 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7
Wildlife, Fish and Plants: Northern Spotted owl - The intent in locating designated habitat areas is to designate spotted owl habitat areas without unnecessary restrictions of other uses of the forest, to the extent possible while meeting the management requirement for spotted owl population viability. The criteria for locating designated habitat areas is as follows: 1) Map spotted owl habitat in the following land use designations: lands withdrawn by Chief's authority or higher, other lands unsuitable for timber production, lands suitable for timber production with reduced yields and lands suitable for timber production with full yields; 2) Map the known locations of spotted owls and show locations of breeding pairs, pairs with verified non-breeding status or breeding status unknown, and other spotted owl sighting; 3) Identify areas in land unsuitable for timber production that have at least the specified acres of habitat within 1.5 miles from a central point in Oregon, and 2.1 miles from a central point in Washington; 4) Access the distribution of habitat relative to spacing standards to determine if additional spotted owl habitat areas need to be designated. If designation is necessary, use mapped owl locations as the priorities for selecting spotted owl habitat areas in lands suitable for timber production; 5) Designate spotted owl habitat areas on lands suitable for timber production if needed to meet the spacing standard. If a verified breeding pair is located closer than six miles from the edge of lands unsuitable for timber production, that areas can be designated if there are no verified breeding pairs within the adjacent lands unsuitable for timber production. The preference is to provide spotted owl habitat areas in a cluster arrangement. Use reduced yield lands before full yield lands where compatible with other criteria; 6) Use the following priorities in designating spotted owl habitat area on lands suitable for timber production (listed in decreasing order of priority): Verified occupancy by breeding pairs within the last five years. If verification is not based on data from the current year, the site should meet, or approximately meet, Regional standards for habitat amounts and characteristics, remained stable since the year of verification. Verified occupancy by breeding pairs more than five years ago. If verification is not based on data from the current year, the site should meet Regional standards for habitat amounts and characteristics, or the habitat amounts and characteristics must have remained stable since the year of verification. Verified occupancy by pairs; verified non-breeding, or breeding status or success unknown. If verification is not based on data from the current year, the site should meet or approximately meet Regional standards for habitat amounts and characteristics, or the habitat amounts and characteristics must have remained stable since the year of verification. Presence of spotted owls; pair status unknown. Areas with an appropriate amount of suitable owl habitat, within the radius prescribed, where the presence or absence of owls is unknown. An appropriate amount of habitat is that specified in Standard and Guideline 1. Amount of Suitable Habitat in Designated Areas.	P	P	EIS Secs. 1.5 EIS Sec. 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Northern Spotted owl - Implementation of these standards and guidelines shall be achieved in a cost-effective manner. Their application will result in designation of spotted owl habitat capable of supporting pairs of spotted owls through time. The Regional Forester will approve National Forest spotted owl habitat networks which result from the application of these standards and guidelines.	C, O	B	EIS Secs. 1.5 EIS Sec. 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. L
Wildlife, Fish and Plants: Northern Spotted owl - Develop wildlife and fish projects that take advantage of the unique characteristics of spotted owl habitat.	P, R	P, B, ,	EIS Secs. 1.5 EIS Sec. 2.1.4 EIS Sec. 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.3.5 7 4.6.3.6 EIS Sec. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 EIS App. F.4 EIS App. F.7 POD Att. DD
Wildlife, Fish and Plants: Existing and Proposed Endangered, Threatened and Sensitive Species - Endangered, threatened and sensitive species (and species proposed for Federal listing by USDA Fish and Wildlife Service [PETS]) will be identified and managed in cooperation with the USDI Fish and Wildlife Service, Oregon Department of Fish and Wildlife, Oregon Department of Agriculture, Oregon Natural Heritage Database, and California Department of Fish and Game.	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 EIS App. F.7 POD Att. J POD Att. DD
Wildlife, Fish and Plants: Existing and Proposed Endangered, Threatened and Sensitive Species - Legal and biological requirements for the conservation of listed and proposed endangered, threatened and sensitive plant and animal species shall be met. Habitat for existing federally-listed species shall be managed to achieve objectives of recovery plans.	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 EIS App. F.7 POD Att. J POD Att. DD
Wildlife, Fish and Plants: Existing and Proposed Endangered, Threatened and Sensitive Species - Biological evaluations (FSM 2672.4) shall be prepared for each project authorized, funded or conducted on the Forest. The biological evaluation shall be used to determine the possible effects the proposed activity will have on listed and PETS species. The biological evaluation consists of five steps. a. Pre-field review of existing information; b. Field reconnaissance of the project area, c. Determination of whether local populations of listed and PETS species will be affected by a project; d. Analysis of the significance of project effects on local and total populations of listed and PETS species, e. When step four cannot be completed due to lack of information, a biological or botanical investigation is conducted to gather the information needed to complete step four.	P, R	P,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 EIS App. F.7L POD Att. J POD Att. DD

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Existing and Proposed Endangered, Threatened and Sensitive Species - If endangered, threatened or proposed species are found in a prefect area, consultation requirements with the USDI Fish and Wildlife Service shall be met in accordance with the Endangered Species Act (Public Law 93-205) and FSM 2671.4 No adverse Impacts on endangered, threatened or proposed species or their habitats shall occur except when It is possible to compensate adverse effects totally through alternatives identified in a biological opinion rendered by the USDI Fish and Wildlife Service (FSM 2670.31) Before a project can be carried out, protection or mitigation requirements shall be specified (NFMA, 36 CFR 219.27(a)(8)).	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 EIS App. F.7L POD Att. J POD Att. L POD Att. DD
Wildlife, Fish and Plants: Existing and Proposed Endangered, Threatened and Sensitive Species - If sensitive species are found in a project area, avoidance or other mitigation to minimize Impacts to local populations shall be used for those species whose viability has been identified as a concern (FSM 2670.32) Maintaining viable populations of species throughout their geographic range (FSM 2670.22) shall be an objective during project planning At a minimum, no action shall result in loss of species viability or create significant trends toward Federal listing (FSM 2670.32).	P, C, R, O	P, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Sec. 3.4.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 EIS App. F.7 POD Att. J POD Att. DD
Wildlife, Fish and Plants: Osprey - Protect active nests during the nesting season. Land management activities having adverse potential impact should not occur within a 20-chain radius of the nest from March 1 to August 31. Nest and perch trees will be protected until they are no longer usable.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Goshawk - Nest sites will be protected from disturbing human activities during the nesting season. To maintain the physical suitability of nesting areas and prevent disturbances that may cause nesting failures, the period of protection will be from March 1 to August 31 for the area within 20 chains of an active nest.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Goshawk - Each nest site is assumed potentially active until June 1. If monitoring has shown that no nesting attempt has been initiated or that a nesting attempt has failed by June 1, the nest site will be considered inactive and the above nest site restriction may be waived. Monitoring will be supervised and evaluated by a qualified wildlife biologist.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Goshawk - Goshawk nests will be protected within a 25-acre no-harvest buffer of trees unless other adjacent alternate buffers are available in a logical basis to maintain habitat over time.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Cavity nesting habitat will be allowed to occur at natural levels on coniferous forest lands. This should provide for 100 percent of the potential population level for cavity nesting species. This may require leaving green trees standing as well, in order to maintain the snags through the rotation. Soft snags will not be removed except for protection or human safety. Snags should be uniformly distributed insofar as practical. Land areas containing activities which impact amounts of large woody material (LWM) on the site shall have LWM management prescription(s). The prescription will not only be site specific but will also consider maintenance of LWM in perpetuity. At a minimum, a 'moderate" amount of LWM will be left after project completion. The moderate range is 10 to 20 pieces of Class I and II logs per acre and all existing Class III, IV and V logs, except for incidental amounts removed during management activities.	P, C, O	P, B, R,	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 POD Att. P POD Att. U POD Att. DD EIS App. F.7
Wildlife, Fish and Plants: Resident Trout and Steelhead – Water quality law establishes a level of aquatic resource management that will maintain the Forest's fisheries habitat at a level capable of sustaining or exceeding minimum viable populations for the various species of anadromous and resident fish. Cold water production for both on and off Forest fish needs is identified as a principal objective for the Forest's streams. Maintain existing fish habitat capability and develop fish habitat improvement projects to fully utilize potential smolt production capability of Forest anadromous streams and resident fish in other streams and lakes. Coordinate land management activities with the California Department of Fish and Game and Oregon Department of Fish and Wildlife objectives. Natural debris, plus trees needed for a future supply, will be maintained and managed to: 1) enhance stream channel and bank structure so as to protect water quality; and 2) provide structural fish habitat to meet the objectives of small habitat capability or resident fish populations provided for in the Forest Plan.	P, C, R, O	P, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.5.2.3 & 4.5.2.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 EIS App. F.7 POD Att. DD
Deer and Elk - Maintain summer range to provide forage, hiding and thermal cover. A restricted operating period from April 1 to June 30 may be imposed in identified deer or elk fawning or calving areas.	P, C, R, O	P, R	EIS Secs. 4.5.1.2 & 4.5.1.3

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Bald Eagle - Develop a bald eagle site management plan for each nesting or roosting area as It is discovered Until a site specific management plan is developed, the following measures will apply Establish the primary nesting zone to be a 330 foot radius around the nest and the secondary zone to be a 660 foot radius around the nest The following activities should not occur within the nesting zones and communal roosting sates 1) Primary Zone All human related activities unless the activities pre-existed to nest discovery and the eagles are apparently tolerant, 2) Secondary Zone - Major land uses such as development of commercial and industrial sites, home, road, powerline or other construction, oil drilling, surface mining, and spraying of chemicals which adversely affect eagles. Timber cutting to enhance habitat is permitted but there is no scheduled timber harvest, 3) Primary and Secondary Zones between January 1 and August 15 - blasting, use of firearms, camping, picnicking, timber harvest, road and water access Into the nesting territory, and low level aircraft operations with helicopters no closer than 1,000 feet and with fixed wing no closer than 500 feet, 4) A communal roost is any stand of trees m which eagles regularly roost together. The primary zone for roosting eagles is 330 feet from the roosting trees and the secondary zone is one-quarter of a mile from the roosting trees. Large trees used as solitary roosts should be left along shoreline of lakes and streams wherever possible Biological evaluation and informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4
Wildlife, Fish and Plants: Peregrine Falcon - Develop a Peregrine falcon site management plan for each nesting area found The site plan design will be tailored to fit the landscape and the use patterns established by the birds. The following may be included in the Plan. 1) Delineate the nest site (eyrie), 2) Define primary (nesting) and secondary and tertiary zones associated with the eyrie, 3) Withdraw the nest site from mineral entry, 4) Restrict management activities and recreational use to September through January: 5) Allow no structural developments within the primary zone unless It benefits the species; 6) Maintain and/or enhance riparian habitats within a three-mile radius of the eyrie, 7) Develop water sources (springs, seeps, ponds, catchments) within approximately one-half mile radius of the eyrie, 8) Implement silvicultural prescriptions, prescribed fire or other management techniques to maintain a mosaic of all vegetative serial stages within the secondary and ternary zones (approximately a three-mile radius of the eyrie); 9) Direct special emphases towards maintaining and/or enhancing mast- and berry-producing shrubs and trees which support jays, bandtail pigeon and other passerine birds. Biological evaluation and Informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Evaluate the effects of proposed projects on wildlife habitat in all environmental analysis. Discuss pertinent components of the habitat such as edge, migration routes, vegetation diversity and microclimate. Specify mitigation measures when the area is disturbed.	P, R	P,	EIS Sec. 2.1.4 EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.5.2.3 & 4.5.2.4 EIS Secs. 4.7.3.5 & 4.7.3.6 EIS App. F.2 EIS App. F.3 EIS App. F.4 POD Att. DD
Range: Livestock grazing is permitted at levels which maintain the desired spotted owl habitat characteristics and species composition of the understory. Forage utilization will be limited to that not needed to maintain indigenous plant species. Exotic plants cannot be introduced.	N		
Range: Salt blocks or water developments are allowed if livestock use does not change the plant composition.	N		
Range: Provide annual permittee plans for livestock distribution and use patterns. Where conflicts cannot be resolved or mitigated, relocation and/or removal of livestock will be considered.	N		
Range: Write range allotment plans to reflect management direction for all lands within the allotment boundary. Allotment planning procedures are documented in FSM 2210.	N		
Range: Develop Coordinated Resource Management Plans where possible and feasible to facilitate the integrated resource management of range and other resources, and between agencies, permittees and other landowners.	N		
Range: Allow range improvements.	N		
Range: Allow increases in permitted grazing use to capture increases in transitory range caused by timber cutting where this is compatible with the suitable owl habitat management objectives.	N		
Range: Prescribe kind and amount of grass seeding in silviculture prescriptions.	N		
Range: Forage utilization standards will be incorporated in allotment management plans. Allotment management plans may include utilization standards which are lower or rarely higher when associated with intensive grazing systems and specific vegetation management objectives which will meet resource management objectives and the intent of the management strategy. The standards include cumulative annual use by big game and livestock. Utilization for grass and grasslike species is based on the percent of plant weight removed. Utilization for shrub species is based on incidence of use, weight, and/or twig length (e.g. utilization is 50 percent if 50 out of 100 leaders are browsed). Satisfactory condition is determined by allotment classification and/or forage condition. Unsatisfactory condition is anything not meeting satisfactory conditions. Allowable use of available forage (Maximum percent of annual utilization by big game and livestock) is:	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

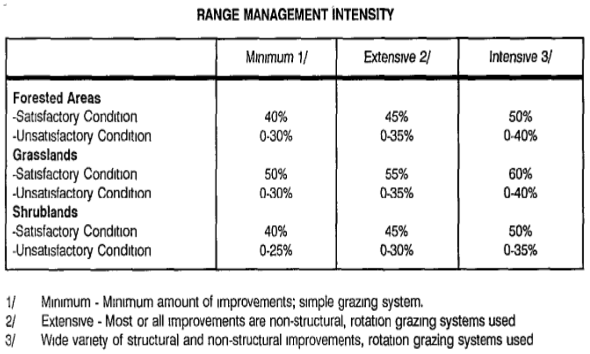
<table>
<tr><th>Element</th><th>Applicable</th><th>Consistency</th><th>Comment</th></tr>
<tr><td>
RANGE MANAGEMENT INTENSITY
<table>
<tr><th></th><th>Minimum 1/</th><th>Extensive 2/</th><th>Intensive 3/</th></tr>
<tr><td>Forested Areas</td><td></td><td></td><td></td></tr>
<tr><td>-Satisfactory Condition</td><td>40%</td><td>45%</td><td>50%</td></tr>
<tr><td>-Unsatisfactory Condition</td><td>0-30%</td><td>0-35%</td><td>0-40%</td></tr>
<tr><td>Grasslands</td><td></td><td></td><td></td></tr>
<tr><td>-Satisfactory Condition</td><td>50%</td><td>55%</td><td>60%</td></tr>
<tr><td>-Unsatisfactory Condition</td><td>0-30%</td><td>0-35%</td><td>0-40%</td></tr>
<tr><td>Shrublands</td><td></td><td></td><td></td></tr>
<tr><td>-Satisfactory Condition</td><td>40%</td><td>45%</td><td>50%</td></tr>
<tr><td>-Unsatisfactory Condition</td><td>0-25%</td><td>0-30%</td><td>0-35%</td></tr>
</table>
1/ Minimum - Minimum amount of improvements; simple grazing system.
2/ Extensive - Most or all improvements are non-structural, rotation grazing systems used
3/ Wide variety of structural and non-structural improvements, rotation grazing systems used</td><td>N</td><td></td><td></td></tr>
<tr><td><u>Timber:</u> There will not be any scheduled volume from these areas.</td><td>N</td><td></td><td></td></tr>
<tr><td><u>Timber:</u> Timber harvest can only take place if it benefits the spotted owl habitat. The exception will be that timber harvest will be allowed in catastrophic situations such as salvage of fire or insect damage and to prevent the spread of insects and disease to areas managed for other purposes providing the owl habitat needs are not compromised or to meet the management area objectives. Salvage operations will require a project environmental analysis and be designed to minimize impact on resources. Restoration of such an area will be designed to return it to a natural state.</td><td>N</td><td></td><td></td></tr>
<tr><td><u>Timber:</u> In the event of a need for access for salvaging timber from catastrophes, nonground based systems, such as helicopter, are preferred.</td><td>N</td><td></td><td></td></tr>
<tr><td><u>Timber:</u> Firewood gathering and cutting compatible with objectives of the area will be permitted.</td><td>N</td><td></td><td></td></tr>
<tr><td><u>Timber:</u> Rehabilitate and reconstruct developments and resources that have been impacted by timber sale activities.</td><td>N</td><td></td><td></td></tr>
<tr><td><u>Timber:</u> All silvicultural prescriptions will be approved by a certified silviculturist and reviewed by the District Ranger.</td><td>N</td><td></td><td></td></tr>
<tr><td><u>Timber:</u> The logging system design for timber sales will be reviewed by logging systems specialists designated by the Forest Supervisor. Review for feasibility, silvicultural compatibility and economics.</td><td>N</td><td></td><td></td></tr>
<tr><td><u>Timber:</u> Maintain a blend of tree species approximating natural stands. In seed collections, no seed lot shall be represented by fewer than 15 families of trees of that species, well distributed across the breeding zone. In addition, no family of parent trees shall represent greater than 20 percent of a seed lot. Although any given plantation may be planted to a single species, strive for a natural seed source from a variety of species.</td><td>N</td><td></td><td></td></tr>
</table>

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Water: Evaluate effects of proposed projects on stream courses In all environmental analysis discuss pertinent stream classification and recommend changes where appropriate as a result of the environmental analysis.	P	P	EIS Sec. 2.4.2.2 EIS Sec. 4.3.2.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.7.3.5 EIS App. F.4 POD Att. I POD Att. CC
Water: Comply with State requirements in accordance with the Clean Water Act of 1972, as amended (1977 and 1987) for protection of waters of the State of Oregon (Oregon Administrative Rules, Chapter 340-41), and the State of California (Porter-Cologne Water Quality Control Act, Division 7) through planning, application, and monitoring of Best Management Practices (BMPs) in conformance with the Clean Water Act of 1972, as amended (1977 and 1987), regulations, and federal guidance issued thereto.	P, C, R, O	P, B	EIS Secs. 1.4 EIS Sec. 1.5 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.7.1 & 2.7.2 EIS Secs. 4.3.2.2 & 4.3.3.2 EIS Secs. 4.4.4.1 & 4.3.4.3 EIS Sec. 4.7.3.5 EIS App. F.4 POD Att. I POD Att. M POD Att. BB
Water: In cooperation with the States of Oregon and California, the Forest will use the following process. a. Select and design BMPs based on site specific conditions, technical, economic, and institutional feasibility, and water quality standards for those waters potentially impacted, b. Implement and enforce BMPs; c. Monitor to insure that practices are correctly applied as designed: d. Monitor to determent the effectiveness of practices in meeting design expectations and in attaining water quality standards: e. Evaluate monitoring results and mitigate where necessary to minimize impacts from activities where BMPs do not perform as expected: f. Adjust BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level Evaluate the appropriateness of water quaky criteria for reasonably assuming protection of beneficial uses. Consider recommending adjustment of water quality standards, g. Use the existing agreed to process to Implement the State Water Quality Management Plan on lands administered by the USFS as described In Memorandums of Understanding between. 1) the Oregon Department of Environmental Quality and US. Department of Agriculture, Forest Service (Z/12/79 and 12/7/82), and “Attachments A and 8’ referred to In this MOU (Implementation Plan for Water Quality Planning on National Forest lands in the Pacific Northwest 12/78 and Best Management Practices for Range and Grazing Activities on Federal lands) and 2) the State Water Resources Control Board, State of California, and U.S. Department of Agriculture Forest Service, Pacific Southwest Region, 1981.	P, C, R, O	P, B	EIS Sec. 1.5 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.7.1 & 2.7.2 EIS Secs. 4.3.2.2 & 4.3.3.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.7.3.5 EIS App. F.4 POD Att. I POD Att. M POD Att. CC

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Water: The following requirements will be employed in protect implementation when proposed projects may affect streams. a. Determine restricted distance from streams for equipment operation, type of stream crossing, if crossing is needed, and erosion control methods, I needed; b. Consider relation of project to riparian strategy areas (all streams classed as I, II and III are allocated to Strategy 26); c. Locate springs that may be affected and evaluate for appropriate levels of protection This would usually require consultation with soil, water or geology specialists; d. In project planning, consider basin constraint percentages by subwatershed as identified in the monitoring plan for watersheds.	P, R	P, B, R,	EIS Sec. 2.1.4 EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.7.2 EIS Sec. 4.1.2.5 EIS Secs. 4.3.1.2, 4.3.2.2 & 4.3.3.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. C POD Att. I POD Att. W POD Att. X POD Att. BB POD Att. DD
Water: Acquire water rights for development of non-reserved uses.	N		
Water: Design project water monitoring as appropriate.	P	P, B	EIS Secs. 2.3.2.1 & 2.1.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.7.1 & 2.7.2 POD Att. I POD Att. M POD Att. CC
Water: Allow for watershed restoration projects.	P, R	P,	EIS Sec. 2.1.4 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. DD
Water: In-stream flows on National Forest lands should be protected through critical analysis of proposed water uses, diversion and transmission applications and renewal of permits.	N		
Water: Insure that proposed projects have no adverse effects on snow survey sates included in the Regional Forester's memorandum of understanding with the Soil Conservation Service.	N		
Water: Comply with the specific direction for management of each of the municipal watersheds as specified in management agreements between the U.S. Department of Agriculture or Forest and municipalities.	N		
Minerals: Prohibit development of aggregate rock sources.	N		
Minerals: Prohibit expansion of existing aggregate sources.	N		
Minerals: Rehabilitate aggregate sources as they are closed.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Minerals: Under mining laws, claimants are entitled to access to their mining claims Access for exploration and development of locatable mineral resources will be analyzed in response to a proposed operating plan A decision on approval of reasonable access will be made as a result of appropriate environmental analyses.	N		
Minerals: Operating plans for mining operations will be processed In a timely manner in accordance with 36 CFR 228.	N		
Minerals: In plans of operation, require operationally feasible provisions designed to: protect riparian and fishery values; meet State water quality standards; and Insure that disturbed areas are reclaimed Insofar as practicable to a practicable condition.	N		
Minerals: Reclamation plans will Identify management objectives for disturbed areas and detail the procedures and time frames necessary to accomplish the objectives Reclamation bonds will be based on actual reclamation costs and formulated using technical and other resource Input.	N		
Human And Community Development: Conduct compliance reviews as required by Title VI of the Civil Rights Act of 1964, and established Forest Service standards.	N		
Human And Community Development: Inform the general public, including minorities and the underprivileged, of availability and benefits which they are eligible to receive from Forest programs. Techniques to Increase awareness and participation will be used.	N		
Human And Community Development: As directed by the American Indian Religious Freedom Act, the Forest will protect and preserve for Native Americans their inherent right of freedom to believe, express and exercise their traditional religions on Forest lands This includes, but is not limited to, access to ceremonial sites, use and possession of sacred objects, and the freedom to worship through traditional ceremonies and rites.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities compatible with interests of surrounding Indian tribes.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities with the Interest of adjacent communities.	N		
Lands: Revise all special use permits to be constant with the direction in this management strategy when renewed.	N		
Lands: Utilize residual capacity in existing utility condors when applications for rights-of-ways from public or private entities are received Analyze any additional corridors with an environmental analysis.	N		
Lands: Direct applications for electronic sates toward use of sates in the following order. a. Utilizing residual capacity of existing sites b. Develop new sates identified in the Forest-wade Electronic Site Plan	P	P	EIS Sec. 2.1.2.2 EIS Sec. 2.3.2.3 EIS Sec. 4.2.2.2 POD Att. D

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Lands: Insure that proposed projects do not have adverse effect on lands included in active exchanges.	N		
Lands: Develop rights-of-ways as necessary to implement projects.	P, C, R, O	P, B, R,	EIS Sec. 1.4 EIS Sec. 1.5 EIS Sec. 2.1.6 EIS Sec. 2.3.2.3 EIS Sec. 3.4.3 EIS Sec. 4.7.3.4 POD Att. I POD Att. U POD Att. Y POD Att. BB
Lands: Proposed projects are responsible for distinguishing boundaries between management areas with differing management objectives.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. U POD Att. T
Lands: Establish and maintain property boundaries on lands administered by the Forest Service.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. U POD Att. T
Soils: Address the potential for detrimental soil displacement, compaction, puddling, severe burning, mass wasting and surface soil erosion in project environmental analysis.	P	P, B,	EIS Sec. 1.5 EIS Sec. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Sec. 4.7.3.4 POD Att. A
Soils: Alternative management practices will be developed or mitigating measures planned and Implemented when activities are likely to result m detrimental displacement, compaction, mass wasting or erosion.	P, R	P, B, ,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Sec. 3.4.3 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Secs. 4.7.3.4 EIS App. F POD Att. I POD Att. DD
Soils: No more than 10 percent of an activity area to be compacted, puddled or displaced upon completion of project (not including permanent roads or landings). No more than 20 percent of the area should be displaced or compacted under circumstances resulting from previous management practices, Including roads and landings Permanent recreation facilities or other permanent facilities are exempt.	P, C, R	P, B, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.4 EIS Sec. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Sec. 4.7.3.4 POD Att. I EIS App. F.2 LRMP Amendment RRNF-6
Soils: Landslide hazard evaluation will be used to assess potential mass wasting risk by the project. The Rogue Rover National Forest landslide, slope stability and hazard rating maps will be used to determine need for detailed slope stability mapping.	P	P, R	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 3.4.3 EIS Sec. 4.1.2.2 POD Att. I

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Soils: Design management activities to return effective ground cover. The mineral soil exposure should not exceed the following limits overall, based on the erosion hazard rating of the soil type, as defined in the Rogue River National Forest Soil Resource Inventory: a. Forty percent mineral soil exposed on soils classed as very slight, slight, low or moderate erosion hazard soils; b. Thirty percent exposure on high or severe erosion hazard soils; c. Fifteen percent exposure on very high or very severe erosion hazard soils.	P	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 POD Att. I
Soils: Rehabilitate adversely impacted sites.	P, R	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 POD Att. I
Facilities: The Access Management Objectives Process, as described m Forest Service Handbook 7709.55, will be used to develop Road Design, Road Operation, Road Maintenance, and Off-Road Travel Criteria These in turn will be used to develop. a. Road and Trawl Design Elements, b. Road and Trawl Design Standards, c. Road Maintenance Levels, d. Road and Trail Maintenance Plans, e. Road Traffic Management Strategies, f. Road Restriction Orders and Traffic Control Devices, g. Off-road Vehicle Management Strategies, h. Travel Maps, and i. Closure Orders.	P	P, B, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.7.2 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. Y
Facilities: Within sensitive soil resource Inventory land types, as shown in Management Strategy 21, the following guidelines apply. a. Geotechnical Input is required for road location, design, and management; b. Temporary roads will be planned, located, surveyed, designed, constructed and operated utilizing the same procedures for reviewing decisions, selecting design elements and standards, and controlling construction, operation, and maintenance as are used for permanent transportation system roads; and c. Roads which access or traverse these land types may be closed seasonally to prevent resource damage.	N		
Facilities: Temporary roads that have been evaluated through the NEPA process are permitted.	P	P	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Facilities: Roads that are no longer needed shall be obliterated and properly drained when they are taken out of service. Vegetation shall be reestablished within one year.	P, R	P, B,	EIS Sec. 2.1.4 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. Y POD Att. DD
Protection: Plan pest control alternatives to be biologically selective, cost beneficial and to have no irreversible adverse effect on the environment.	P	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.8 EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Sec. 4.4.2.3 EIS Secs. 4.5.1.2 & 4.5.1.3 POD Att. I POD Att. N POD Att. X
Protection: Provide a low level of prevention activities limited primarily to public contact through patrol and fire prevention signing at campgrounds, rest areas, main access road junctions and information centers.	N		
Protection: Use prescription fire to obtain desired ecological characteristics of the area.	P, C, R, O	P, B	EIS Sec. 4.4.2.3 EIS Secs. 4.7.3.5 & 4.7.3.6 EIS App. F.3 EIS App. F.4 POD Att. R
Protection: Treat activity fuels to a level which meets protection standards and resource objectives in a cost-efficient manner.	P, C, R, O	P, B	EIS Sec. 4.4.2.3 EIS Sec. 4.7.3.5 EIS App. F.4 POD Att. K POD Att. R
Protection: Hazard reduction activities will be compatible with management area objectives.	P, C, R, O	P, B	EIS Sec. 2.1.6 EIS Sec. 2.6.2 EIS Sec. 4.4.2.3 EIS Secs. 4.7.3.5 & 4.7.3.6 EIS App. F.3 EIS App. F.4 POD Att. R

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Protection: Conduct prescribed burning in such a manner that it will conform to applicable provisions of the Federal Clean Air Act, Oregon Smoke Management Plan and the Rogue River National Forest Smoke Management Plan.	P, C, R, O	P, B	EIS Sec. 1.5 EIS Sec. 2.4.2.1 EIS Sec. 2.7.2 EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Sec. 4.4.2.3 EIS Secs. 4.7.3.5 & 4.7.3.6 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 EIS App. F.3 EIS App. F.4 POD Att. I POD Att. R
Protection: Each wildfire will have an appropriate response in accordance with the Rogue River National Forest Fire Management Policy and Plan.	N		
Timber Suitable 1 20			
Recreation – Roaded Modified: Manage the area for Modification Visual Quality Objective. Blend and shape regeneration openings with the natural terrain to the extent possible. Assess the impacts to visual resources in all project environmental analysis. Specifically address how the visual quality objective will be met.	N		
Recreation – Roaded Modified: Allow for dispersed recreation activities such as hunting, fishing and the gathering of forest products.	N		
Recreation – Roaded Modified: Manage trails and dispersed occupancy sites in a manner not in conflict with timber management activities and timber resource values.	N		
Recreation – Roaded Modified: Identify the potential effect of any proposed activity on recreation opportunity spectrum classes In all project environmental analysis.	N		
Recreation – Roaded Modified: Protect Special Dispersed Features, including trails, from adverse impacts until management of the special dispersed features is addressed in an environmental analysis. The environmental analysis shall propose alternative management practices and mitigation measures where appropriate.	N		
Recreation – Roaded Modified: Rehabilitate deteriorated recreation use areas.	N		
Recreation – Roaded Modified: Investigate area to inventory archaeological, historical or other cultural resource properties which may be located within the proposed "area of effect" of projects or elsewhere. Document results of the investigation/ inventory in the project environmental analysis. Inventory of non-project areas will be guided by the Forest's cultural resource inventory strategy.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Recreation – Roaded Modified: Evaluate the cultural resources found within the area using a qualified cultural resource specialist to determine their potential archaeological, historical or cultural significance Evaluate cultural resources on a project-specific basis or by thematic/multi-resource group If a cultural resource is discovered after project activity has begun, the activity will cease or be modified until an evaluation of significance can be made.	N		
Recreation – Roaded Modified: Assess the impacts of a proposed action to determine the effect of the project upon potentially or known significant cultural resources.	N		
Recreation – Roaded Modified: Mitigate potential adverse impacts to significant cultural resources by redesigning the project to avoid damage or disturbance, or implementing appropriate mitigation procedures to reduce the adverse impact to the property.	N		
Recreation – Roaded Modified: Inventory and protect cultural resources to Insure that values are not damaged or destroyed until they can be evaluated for scientific study, interpretation or other appropriate uses Protection of values may include maintenance of structures, avoidance of the site, or scientific removal, analysis and reporting.	N		
Recreation – Roaded Modified: Evaluate and enhance cultural resources for scientific, educational, recreational and ethnic use to the extent the Integrity of the resource is maintained Use will be carefully monitored.	N		
Recreation – Roaded Modified: Develop and administer schedules for long-range cultural resource management Coordinate cultural resource management with appropriate State and Federal agencies.	N		
Recreation – Roaded Modified: Properties that meet the significance criteria will be treated as eligible to the National Register of Historic Places; eligible properties will be nominated to the National Register.	N		
Recreation – Roaded Modified: Off-road vehicle recreation use is permitted when not in conflict with timber management or other resource objectives.	N		
Wilderness: This element is not applicable under a timber management strategy.	N		
Wilderness: Project plans will assure that Wilderness boundaries are not violated.	N		
Wildlife, Fish and Plants: Permit wildlife and fish projects that do not conflict with recreation management activities and recreation resource values.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Endangered, threatened and sensitive species (and species proposed for Federal listing by USDA Fish and Wildlife Service (PETS]) will be identified and managed in cooperation with the USDI Fish and Wildlife Service, Oregon Department of Fish and Wildlife, Oregon Department of Agriculture, Oregon Natural Heritage Database, and California Department of Fish and Game.	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 EIS App. F.7 POD Att. J POD Att. DD
Wildlife, Fish and Plants: Legal and biological requirements for the conservation of listed and proposed endangered, threatened and sensitive plant and animal species shall be met. Habitat for existing federally-listed species shall be managed to achieve objectives of recovery plans.	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 EIS App. F.7 POD Att. J POD Att. DD
Wildlife, Fish and Plants: Biological evaluations (FSM 2672.4) shall be prepared for each project authorized, funded or conducted on the Forest. The biological evaluation shall be used to determine the possible effects the proposed activity will have on listed and PETS species. The biological evaluation consists of five steps. a. Pre-field review of existing information; b. Field reconnaissance of the project area, c. Determination of whether local populations of listed and PETS species will be affected by a project; d. Analysis of the significance of project effects on local and total populations of listed and PETS species, e. When step four cannot be completed due to lack of information, a biological or botanical investigation is conducted to gather the information needed to complete step four.	P, R	P,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 EIS App. F.7 POD Att. J POD Att. DD
Wildlife, Fish and Plants: If endangered, threatened or proposed species are found in a prefect area, consultation requirements with the USDI Fish and Wildlife Service shall be met in accordance with the Endangered Species Act (Public Law 93-205) and FSM 2671.4 No adverse Impacts on endangered, threatened or proposed species or their habitats shall occur except when It is possible to compensate adverse effects totally through alternatives identified in a biological opinion rendered by the USDI Fish and Wildlife Service (FSM 2670 31) Before a project can be carried out, protection or mitigation requirements shall be specified (NFMA, 36 CFR 219.27(a)(8)).	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 EIS App. F.7 POD Att. J POD Att. L POD Att. DD
Wildlife, Fish and Plants: If sensitive species are found in a project area, avoidance or other mitigation to minimize Impacts to local populations shall be used for those species whose viability has been identified as a concern (FSM 2670.32) Maintaining viable populations of species throughout their geographic range (FSM 2670.22) shall be an objective during project planning At a minimum, no action shall result in loss of species viability or create significant trends toward Federal listing (FSM 2670.32).	P, C, R, O	P, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Sec. 3.4.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 EIS App. F.7 POD Att. J POD Att. DD

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Wildlife, Fish and Plants: Northern Spotted Owl – Manage this species under the standards and guidelines established in the ROD for the Supplement to the Environmental Impact Statement for an amendment to the Pacific Northwest Regional Guide In the event that a pair of northern spotted owls are found in an area, consideration will be given to (1) the need to improve the distribution of older forest ecosystems for all associated plant and animal species, (2) providing insight Into management of spotted owl habitat areas (SOHA) through experimental habitat manipulation During the planning and scheduling phase of a timber sale or any other project activity that may Impact spotted owl habitat, conduct a biological evaluation in order to determine the degree of Impact and to provide for protective measures.	P, C, R, O	P, R, ,	EIS Secs. 1.5 EIS Sec. 2.1.4 EIS Sec. 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS Secs. 4.7.3.4 & 4.7.3.6 EIS App. F.2 EIS App. F.3 EIS App. F.7 POD Att. DD
Wildlife, Fish and Plants: Osprey – Protect active nests during the nesting season Land management activities having adverse potential impact should not occur within a 20-chain radius of the nest from March 1 to August 31 Nest and perch trees will be protected until they are no longer usable.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Goshawk – Nest sites will be protected from disturbing human activities during the nesting season. To maintain the physical suitability of nesting areas and prevent disturbances that may cause nesting failures, the period of protection will be from March 1 to August 31 for the area within 20 chains of the active nest.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Goshawk – Each nest site is assumed potentially active until June 1. If monitoring has shown that no nesting attempt has been initiated or that a nesting attempt has failed by June 1, the nest site will be considered inactive and the above nest site restriction may be waived Monitoring will be supervised and evaluated by a qualified wildlife biologist.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Goshawk – Goshawk nests will be protected within a 25 acre no-harvest buffer of trees unless other adjacent alternate buffers are available in a logical basis to maintain habitat over time.	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Leave sufficient wildlife trees (hard snags or green trees designated to become snags) in coniferous forest lands to provide for at least 40 percent of the potential population levels for cavity nesting species. The distribution of numbers and size class necessary to meet 40 percent per 100 acres is as follows: Siskiyou and Cascade Mixed Conifer Size Number 15+ 119 17+ 24 25+ 2 Total 145 Siskiyou and Cascade True Fir Size Number 15+ 95 17+ 7 25+ 2 Total 104	P, C, R, O	P, R,	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 POD Att. P POD Att. U POD Att. DD EIS App. F.7

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Species distribution should be representative of the site's original stand. Trees selected for retention should maximize use of the stand's cull component. If the proper number and size of trees do not exist in the stand to be treated, select the proper number from the next lower size class. (i.e. if 25" trees are not available go to 17" trees). Material that satisfies the need for down woody material recruitment will come from existing down material, down woody material that is the result of a silvicultural treatment and from the trees that are designated to meet standing wildlife tree requirements. The long-term goal for large woody material (LWM) is 10 to 20 pieces of class I and II logs per acre, and all existing class III, IV and V logs, except for incidental amounts removed during management activities. Additional green merchantable trees will not be designated unless none of the other categories exist. The expected life span of snags or dead trees in mixed conifer working groups is 30 years and in true fir working groups the life span is 20 years. The silvicultural prescription will describe the total number, size and species of wildlife trees that will be required through the next full rotation of the stand being treated. Wildlife and down woody material requirement will be included as part of the vegetative (silvicultural) prescription for each stand. Information for the prescription will be provided by a wildlife biologist based on site by site needs. A certified silviculturist will validate the data and include it in the preparation of the final vegetative (silvicultural) prescription that implements all the interdisciplinary requirements. The logging system required, reforestation needs, slash disposal requirements and site preparation needs should be compatible with the wildlife tree distribution needs. Primary cavity excavator habitat will be met on areas no larger than 60 acres including adjacent existing harvest units. The objective is to provide well distributed habitat and allow adjacent stands to provide the needed wildlife trees for past harvest units where current standards were not met. Where past timber harvest activities created clearcuts, the acreage within a 900 foot "edge" adjacent to an uncut timber stand will be used to compute the number of wildlife trees needed to bring this common boundary "edge', area up to a minimum 20 percent potential population level for cavity nesting species. Excess cull trees and snags in the adjacent uncut stand, (being managed at the 40 percent level), if available, can be applied to the number of wildlife trees needed in the "edge" area. If no culls or snags are available, green merchantable trees may be marked and managed for wildlife tree needs in this uncut area.	P, C, O, R	P, B,	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 POD Att. P POD Att. U POD Att. DD EIS App. F.7
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) On existing large shelterwood areas it is assumed that natural mortality will occur to meet the 20 percent potential population levels needed as a minimum, however, if there are excess cull trees and snags in adjacent stands, they can be used to bring the biological potential up to 40 percent. The minimum 20 percent biological potential level will not be met for two or more decades on the area beyond the 900 foot "edge", on existing clearcut areas. By that time natural mortality will begin to occur in the new stands and sufficient trees will be managed for wildlife needs.	P, R	P,	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 POD Att. P POD Att. U POD Att. DD EIS App. LF.7

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Selection of wildlife trees to make up for past deficits will meet the same selection criteria as in newly treated stands. Green merchantable trees will not be girdled to create wildlife snags, regardless of the situation, until 5-10 years after project completion (sale closure), in order to capture any mortality that may occur during that time. Adequacy of wildlife tree levels will be monitored as a part of the Forest Plan.	P, C, R, O	P,	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 POD Att. P POD Att. U POD Att. DD EIS App. LF.7
Wildlife, Fish and Plants: Deer and Elk - Maintain summer range to provide 20 percent forage, and at least 20 percent thermal cover for an area generally 500 to 1,000 acres. To the extent possible, timber harvesting and/or thinning should provide hiding and thermal cover between treatment areas and roads with continuous vehicle use. Hiding cover should be dense enough to hide 90 percent of a deer or elk from view at 200 feet. Hiding cover need not be continuous but gaps between screens should not exceed one-quarter of a mile. A restricted operating period from April 1 to June 30 may be imposed in identified deer or elk fawning or calving areas.	P, C, R, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3
Wildlife, Fish and Plants: Bald Eagle - Develop a bald eagle site management plan for each nesting or roosting area as It is discovered Until a site specific management plan is developed, the following measures will apply Establish the primary nesting zone to be a 330 foot radius around the nest and the secondary zone to be a 660 foot radius around the nest The following activities should not occur within the nesting zones and communal roosting sates 1) Primary Zone All human related activities unless the activities pre-existed to nest discovery and the eagles are apparently tolerant, 2) Secondary Zone - Major land uses such as development of commercial and industrial sites, home, road, powerline or other construction, oil drilling, surface mining, and spraying of chemicals which adversely affect eagles. Timber cutting to enhance habitat is permitted but there is no scheduled timber harvest, 3) Primary and Secondary Zones between January 1 and August 15 - blasting, use of firearms, camping, picnicking, timber harvest, road and water access Into the nesting territory, and low level aircraft operations with helicopters no closer than 1,000 feet and with fixed wing no closer than 500 feet, 4) A communal roost is any stand of trees m which eagles regularly roost together. The primary zone for roosting eagles is 330 feet from the roosting trees and the secondary zone is one-quarter of a mile from the roosting trees. Large trees used as solitary roosts should be left along shoreline of lakes and streams wherever possible Biological evaluation and informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4

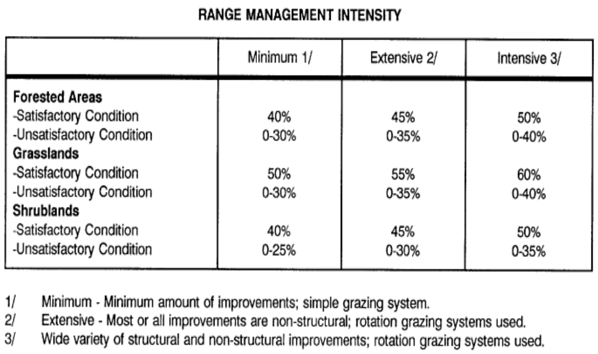
TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Wildlife, Fish and Plants: Peregrine Falcon - Develop a Peregrine falcon site management plan for each nesting area found The site plan design will be tailored to fit the landscape and the use patterns established by the birds. The following may be included in the Plan. 1) Delineate the nest site (eyrie), 2) Define primary (nesting) and secondary and tertiary zones associated with the eyrie, 3) Withdraw the nest site from mineral entry, 4) Restrict management activities and recreational use to September through January: 5) Allow no structural developments within the primary zone unless It benefits the species; 6) Maintain and/or enhance riparian habitats within a three-mile radius of the eyrie, 7) Develop water sources (springs, seeps, ponds, catchments) within approximately one-half mile radius of the eyrie, 8) Implement silvicultural prescriptions, prescribed fire or other management techniques to maintain a mosaic of all vegetative serial stages within the secondary and ternary zones (approximately a three-mile radius of the eyrie); 9) Direct special emphases towards maintaining and/or enhancing mast- and berry-producing shrubs and trees which support jays, bandtail pigeon and other passerine birds. Biological evaluation and Informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7
Range: Permit livestock grazing on transitory ranges under the following situations: a. Where forage occurs in natural stands or as a result of site disturbance and/or timber canopy removal on a periodic basis. b. Where disturbed sites and/or areas under timber management can be seeded with species which improve forage production and does not restrict tree establishment and growth. (FSM 2521.02, RR Supplement #6, 2/73). c. On forest plantations when livestock will not damage the young trees.	N		
Range: Provide annual permittee plans for livestock distribution and use patterns Where conflicts cannot be resolved or mitigated, relocation or removal of livestock will be considered.	N		
Range: Write range allotment plans to reflect management direction for all lands within the allotment boundary. Allotment planning procedures are documented m FSM 2210.	N		
Range: Develop Coordinated Resource Management Plans where possible and feasible to facilitate the integrated resource management of range and other resources, and between agencies, permittees and other landowners.	N		
Range: Develop structural and non-structural range improvements.	N		
Range: Allow increases in permitted grazing use to capture increases in transitory range caused by timber cutting where this is compatible with the timber management objectives.	N		
Range: Prescribe kind and amount of vegetative seeding in silviculture prescriptions.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

<table>
<tr><th>Element</th><th>Applicable</th><th>Consistency</th><th>Comment</th></tr>
<tr><td><u>Range:</u> Forage utilization standards will be incorporated in allotment management plans. Allotment management plans may include utilization standards which are lower or rarely higher when associated with intensive grazing systems and specific vegetation management objectives which will meet resource management objectives and the intent of the management strategy. The standards include cumulative annual use by big game and livestock. Utilization for grass and grasslike species is based on the percent of plant weight removed. Utilization for shrub species is based on incidence of use, weight, and/or twig length (e.g. utilization is 50 percent if 50 out of 100 leaders are browsed). Satisfactory condition is determined by allotment classification and/or forage condition. Unsatisfactory condition is anything not meeting satisfactory conditions. Allowable use of available forage (Maximum percent of annual utilization by big game and livestock) is:</td><td>N</td><td></td><td></td></tr>
<tr><td>

RANGE MANAGEMENT INTENSITY

<table>
<tr><th></th><th>Minimum 1/</th><th>Extensive 2/</th><th>Intensive 3/</th></tr>
<tr><td>Forested Areas</td><td></td><td></td><td></td></tr>
<tr><td>-Satisfactory Condition</td><td>40%</td><td>45%</td><td>50%</td></tr>
<tr><td>-Unsatisfactory Condition</td><td>0-30%</td><td>0-35%</td><td>0-40%</td></tr>
<tr><td>Grasslands</td><td></td><td></td><td></td></tr>
<tr><td>-Satisfactory Condition</td><td>50%</td><td>55%</td><td>60%</td></tr>
<tr><td>-Unsatisfactory Condition</td><td>0-30%</td><td>0-35%</td><td>0-40%</td></tr>
<tr><td>Shrublands</td><td></td><td></td><td></td></tr>
<tr><td>-Satisfactory Condition</td><td>40%</td><td>45%</td><td>50%</td></tr>
<tr><td>-Unsatisfactory Condition</td><td>0-25%</td><td>0-30%</td><td>0-35%</td></tr>
</table>

1/ Minimum - Minimum amount of improvements; simple grazing system.
2/ Extensive - Most or all improvements are non-structural; rotation grazing systems used.
3/ Wide variety of structural and non-structural improvements; rotation grazing systems used.</td><td>N</td><td></td><td></td></tr>
<tr><td><u>Timber:</u> When trees are cut for timber production objectives, the cutting shall be made in a way to assure that technology and knowledge exist to adequately restock the site within five years after final harvest (36 CFR 219 27(c)(3)).</td><td>N</td><td></td><td></td></tr>
<tr><td><u>Timber:</u> Timber harvesting shall only occur on lands classified as suitable for timber production except for salvage sales, sales necessary to protect other multiple-use values or activities that meet other objectives d the Forest Plan establishes that such actions are appropriate (36 CFR 219 27(c)(l)).</td><td>N</td><td></td><td></td></tr>
</table>

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: The landscape will be predominated by a mosaic of even-aged managed timber stands although even and uneven aged management are accepted systems in this strategy. Silvicultural practices employed to accomplish management goals may include the following: a. Site preparation - chemical, mechanical, biological and manual and prescribed fire; b. Tree improvement (genetics); c. Reforestation by planting Random natural seeding will count towards reaching desired stocking; d. Growing stock protection from animals, insects and diseases; e. Release and weeding - chemical, mechanical, biological and manual and prescribed fire; f. Precommercial thinning; g. Fertilization; h. Commercial thinning; i. Salvage mortality as necessary; j. Final Harvest - even-aged silvicultural system using shelterwood, seed tree or clearcut methods The shelterwood method will probably be the most common, however, selection will be determined by the environmental assessment process and documented in a site-specific silvicultural prescription, k. Pruning.	N		
Timber: Rehabilitate and reconstruct developments and resources that have been impacted by timber sale activities if in keeping with the goals and objectives of this management strategy.	N		
Timber: The logging system design for timber sales will be reviewed by logging systems specialists designated by the Forest Supervisor. Content review will be for feasibility, silvicultural compatibility and economics.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: The even-aged silvicultural system will be the most commonly used system in coniferous forests The uneven-aged silvicultural system may be used when healthy, fully stocked, uneven aged stands exist or can be created by identified treatments within a defined time period The selection of the appropriate silvicultural system will be guided by the following criteria. a. Must permit the production of sufficient volume of marketable trees to permit utilization of all trees which meet utilization standards and are designated for harvest. b. Must permit the use of an available and acceptable logging method. c. Must be capable of providing special conditions when required by critical soil conditions or needed to achieve management objectives. d. Must permit control of existing or potential vegetation to a degree that establishment of numbers of trees and rates of growth as identified In site-specific silvicultural prescriptions for harvest areas can be achieved. e. Must promote stand structure and species composition which avoids serious risk of damage from mammals, Insects, disease or wildfire and will allow treatment of existing Insect, disease or fuel conditions. f. Must meet resource and vegetation management objectives identified for this management area.	N		
Timber: Forest openings created by the application of even-aged silviculture shall be limited to a maximum size of 60 acres in the Douglas-fir forest type and to a maximum size of 40 acres on all other lands of the Forest. Exceptions are permitted in the following cases: a. When natural catastrophic situations such as fires, windstorms, or insect and disease attacks occur. b. On an individual timber sale basis after 60-day, public notice and review by the Regional Forester.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: When any one of the criteria described below is met and will produce a more desirable combination of benefits, the limits may be exceeded by not more than 50 percent without review by the Regional Forester or 60-day public notice. a. When larger created openings will reduce the disturbance to soil, water, fish or riparian resources, or residual vegetation by: (1) allowing economically feasible logging systems that reduce landing and road construction, or (2) locating roads away from unstable soils, and (3) by reducing soil and vegetation disturbance from dragging logs. b. Where groups of dwarf mistletoe or root rot disease infected trees need to be incorporated into the created opening to avoid infection of susceptible conifer reproduction and their inclusion cannot be achieved by centering the created opening over the area of infection. c. Where visual quality objectives require shaping and blending of openings to fit landform. d. Where larger units are needed to achieve silviculture objectives in existing areas of regeneration cutting by the shelterwood method and where destruction of the newly created stand of reproduction would occur as a result of delayed removal of shelter trees. This exception applies only to existing shelterwood units and shelterwood units under contract prior to approval of Forest Plan.	N		
Timber: Created openings will be separated by areas generally not classed as created openings. The areas between created openings shall contain one or more logical harvest units. These areas shall be large enough and contain a stand structure to meet resource requirements of the management area. The total area of created openings contiguous to 30-acre or larger natural openings should normally be limited to an area not exceeding 1/3 the size of the natural opening and not occupying more than 1/3 of the natural opening perimeter. When openings are created adjacent to natural openings, they should be designed to retain and manage adequate vegetation along the edge in sufficient density to retain wildlife values and visual management objectives. The determination of adequate vegetation will be made by an appropriate interdisciplinary team.	N		
Timber: A harvested area of commercial forest will no longer be considered a created opening for silvicultural purposes when stocking surveys carried out in accordance with Regional instructions indicate prescribed crop tree stocking at or above 4.5 feet in height and free to grow.	N		
Timber: Strive for a reasonably balanced acreage in each age class (i.e. 20 percent of each 500 to 1,000 acre area in stands 40 feet tall with 70 percent crown closure) to obtain biological diversity and thermal cover.	N		
Timber: Reforestation, precommercial thinning and release to meet recommended (full) stocking will be addressed with site-specific silvicultural prescriptions.	N		
Timber: Set harvest treatment priorities by cut categories on each District so that the stands most needing treatment are done first, wherever reasonably possible.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Maintain a blend of tree species approximating natural stands In seed collections, no seed lot shall be represented by fewer than 15 families of trees of that species well distributed across the breeding zone In addition, no family of parent trees shall represent greater than 20 percent of a seed lot Although any given plantation may be planted to a single species, strive for a natural seed source from a variety of species.	N		
Timber: Make miscellaneous forest products such as poles, posts, boughs, Christmas trees, house-logs, etc., available on an as-needed basis consistent with resource objectives of affected management areas.	N		
Timber: Provide access to potential fuelwood or bring the fuelwood to convenient points in timber sale or thinning areas through the utilization of appropriate timber sale clauses or the modification of fuels management prescriptions to meet this objective.	N		
Timber: Allow commercial fuelwood contracts for slash disposal, thinning and site preparation.	N		
Timber: Open slash areas to fuelwood gathering prior to traditional disposal methods.	N		
Timber: Leave slash as a fuelwood source where there is no conflict with resource activity.	N		
Timber: Consider using the fuelwood program as a means to meet silvicultural objectives in appropriate areas, such as low productivity stands or other stands prior to reaching commercial size.	N		
Timber: Consider the season of year and access when implementing a fuelwood program. The public should be encouraged to burn dry wood.	N		
Timber: Document fuelwood availability for public uses in project environmental analysis.	N		
Timber: Be responsive to needs of public for fuelwood.	N		
Timber: Create a Forest fuelwood and miscellaneous products policy to include fuelwood inventory.	N		
Timber: Utilization standards for timber harvested will meet the standards as stated in the Pacific Northwest Regional Guide, Standards and Guidelines 4-2 and in Table 3-6. Standards in timber sale contracts may vary depending on markets and costs of harvesting.	N		

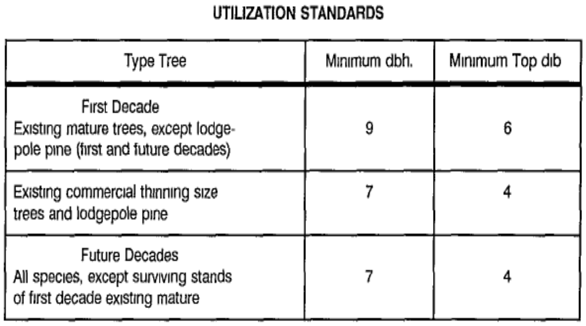
<table>
<tr><th colspan="4">TABLE 2.2-1
Rogue River National Forest Land and Resource Management Plan</th></tr>
<tr><th>Element</th><th>Applicable</th><th>Consistency</th><th>Comment</th></tr>
<tr><td>
UTILIZATION STANDARDS
<table>
<tr><th>Type Tree</th><th>Minimum dbh.</th><th>Minimum Top dib</th></tr>
<tr><td>First Decade
Existing mature trees, except lodgepole pine (first and future decades)</td><td>9</td><td>6</td></tr>
<tr><td>Existing commercial thinning size trees and lodgepole pine</td><td>7</td><td>4</td></tr>
<tr><td>Future Decades
All species, except surviving stands of first decade existing mature</td><td>7</td><td>4</td></tr>
</table></td><td>N</td><td></td><td></td></tr>
<tr><td><u>Water:</u> Evaluate effects of proposed projects on stream courses In all environmental analysis discuss pertinent stream classification and recommend changes where appropriate as a result of the environmental analysis.</td><td>P</td><td>P</td><td>EIS Sec. 2.4.2.2
EIS Sec. 4.3.2.2
EIS Secs. 4.3.4.1 & 4.3.4.3
EIS Sec. 4.7.3.5EIS App. F.4
POD Att. I
POD Att. CC</td></tr>
<tr><td><u>Water:</u> Comply with State requirements in accordance with the Clean Water Act of 1972, as amended (1977 and 1987) for protection of waters of the State of Oregon (Oregon Administrative Rules, Chapter 340-41), and the State of California (Porter-Cologne Water Quality Control Act, Division 7) through planning, application, and monitoring of Best Management Practices (BMPs) in conformance with the Clean Water Act of 1972, as amended (1977 and 1987), regulations, and federal guidance issued thereto.</td><td>P, C, R, O</td><td>P, B</td><td>EIS Secs. 1.4
EIS Sec. 1.5
EIS Secs. 2.4.2.1 & 2.4.2.2
EIS Secs. 2.7.1 & 2.7.2
EIS Secs. 4.3.2.2 & 4.3.3.2
EIS Secs. 4.3.4.1 & 4.3.4.3
EIS Sec. 4.7.3.5
EIS App. F.4
POD Att. I
POD Att. M
POD Att. BB</td></tr>
</table>

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Water: In cooperation with the States of Oregon and California, the Forest will use the following process. a. Select and design BMPs based on site specific conditions, technical, economic, and institutional feasibility, and water quality standards for those waters potentially impacted, b. Implement and enforce BMPs; c. Monitor to insure that practices are correctly applied as designed: d. Monitor to determent the effectiveness of practices in meeting design expectations and in attaining water quality standards: e. Evaluate monitoring results and mitigate where necessary to minimize impacts from activities where BMPs do not perform as expected: f. Adjust BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level Evaluate the appropriateness of water quaky criteria for reasonably assuming protection of beneficial uses. Consider recommending adjustment of water quality standards, g. Use the existing agreed to process to Implement the State Water Quality Management Plan on lands administered by the USFS as described In Memorandums of Understanding between. 1) the Oregon Department of Environmental Quality and US. Department of Agriculture, Forest Service (Z/12/79 and 12/7/82), and “Attachments A and 8’ referred to In this MOU (Implementation Plan for Water Quality Planning on National Forest lands in the Pacific Northwest 12/78 and Best Management Practices for Range and Grazing Activities on Federal lands) and 2) the State Water Resources Control Board, State of California, and U.S. Department of Agriculture Forest Service, Pacific Southwest Region, 1981.	P, C, R, O	P, B	EIS Sec. 1.5 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 EIS Secs. 4.3.2.2 & 4.3.3.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.7.3.5 EIS App. F.4 POD Att. I POD Att. M POD Att. CC
Water: The following requirements will be employed in protect implementation when proposed projects may affect streams. a. Determine restricted distance from streams for equipment operation, type of stream crossing, if crossing is needed, and erosion control methods, I needed; b. Consider relation of project to riparian strategy areas (all streams classed as I, II and III are allocated to Strategy 26); c. Locate springs that may be affected and evaluate for appropriate levels of protection This would usually require consultation with soil, water or geology specialists; d. In project planning, consider basin constraint percentages by subwatershed as identified in the monitoring plan for watersheds.	P, R	P, B, R, ,	EIS Sec. 2.1.4 EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.7.2 EIS Sec. 4.1.2.5 EIS Secs. 4.3.1.2, 4.3.2.2 & 4.3.3.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. C POD Att. I POD Att. W POD Att. X POD Att. BB POD Att. DD
Water: Acquire water rights for development of non-reserved uses.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Water: Design project water monitoring as appropriate.	P	P, B	EIS Secs. 2.3.2.1 & 2.1.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.7.1 & 2.7.2 POD Att. I POD Att. M POD Att. C
Water: Allow for watershed restoration projects.	P, R	P,	EIS Sec. 2.1.4 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. DD
Water: In-stream flows on National Forest lands should be protected through critical analysis of proposed water uses, diversion and transmission applications and renewal of permits.	N		
Water: Insure that proposed projects have no adverse effects on snow survey sates included in the Regional Forester's memorandum of understanding with the Soil Conservation Service.	N		
Minerals: Develop and manage new and existing aggregate sources in compliance with approved Rock Resource Development Plan and an approved environmental analysis.	N		
Minerals: Under mining laws, claimants are entitled to access to their mining claims Access for exploration and development of locatable mineral resources will be analyzed in response to a proposed operating plan A decision on approval of reasonable access will be made as a result of appropriate environmental analyses.	N		
Minerals: Operating plans for mining operations will be processed In a timely manner in accordance with 36 CFR 228.	N		
Minerals: In plans of operation, require operationally feasible provisions designed to' protect riparian and fishery values, meet State water quality standards: and Insure that disturbed areas are reclaimed Insofar as practicable to a practicable condition.	N		
Minerals: Reclamation plans will Identify management objectives for disturbed areas and detail the procedures and time frames necessary to accomplish the objectives Reclamation bonds will be based on actual reclamation costs and formulated using technical and other resource Input.	N		
Human And Community Development: Conduct compliance reviews as required by Title VI of the Civil Rights Act of 1964, and established Forest Service standards.	N		
Human And Community Development: Inform the general public, including minorities and the underprivileged. of availability and benefits which they are eligible to receive from Forest programs. Techniques to Increase awareness and participation will be used.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Human And Community Development: As directed by the American Indian Religious Freedom Act, the Forest will protect and preserve for Native Americans their inherent right of freedom to believe, express and exercise their traditional religions on Forest lands This includes, but is not limited to, access to ceremonial sites, use and possession of sacred objects, and the freedom to worship through traditional ceremonies and rites.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities compatible with interests of surrounding Indian tribes.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities with the Interest of adjacent communities.	N		
Lands: Revise all special use permits to be constant with the direction in this management strategy when renewed.	N		
Lands: Utilize residual capacity in existing utility condors when applications for rights-of-ways from public or private entities are received Analyze any additional corridors with an environmental analysis.	N		
Lands: Use control measures to prohibit livestock access to chemically treated corridors.	N		
Lands: Direct applications for electronic sites toward use of sites in the following order. a. Utilizing residual capacity of existing Sites b. Develop new sites identified in the Forest-wade Electronic Site Plan	P	P	EIS Sec. 2.1.2.2 EIS Sec. 2.3.2.3 EIS Sec. 4.2.2.2 POD Att. D
Lands: Insure that proposed projects do not have adverse effect on lands included in active exchanges.	N		
Lands: Develop rights-of-ways as necessary to implement projects.	P, C, R, O	P, B, R,	EIS Sec. 1.4 EIS Sec. 1.5 EIS Sec. 2.1.6 EIS Sec. 2.3.2.3 EIS Sec. 3.4.3 EIS Sec. 4.7.3.4 POD Att. I POD Att. U POD Att. Y POD Att. BB
Lands: Proposed projects are responsible for distinguishing boundaries between management areas with differing management objectives.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. U POD Att. 21
Lands: Establish and maintain property boundaries on lands administered by the Forest Service.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. U POD Att. 21

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Soils: Address the potential for detrimental soil displacement, compaction, puddling, severe burning, mass wasting and surface soil erosion in project environmental analysis.	P	P, B,	EIS Sec. 1.5 EIS Sec. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Sec. 4.7.3.4 POD Att. I
Soils: Alternative management practices will be developed or mitigating measures planned and Implemented when activities are likely to result m detrimental displacement, compaction, mass wasting or erosion.	P, R	P, B, ,	
Soils: No more than ten percent of an activity area to be compacted, puddled or displaced upon completion of project (not including permanent roads or landings). No more than 20 percent of the area should be displaced or compacted under circumstances resulting from previous management practices, Including roads and landings Permanent recreation facilities or other permanent facilities are exempt.	P, C, R	P, B, A	EIS Sec. 1.5 EIS Sec. 2.1.3.4 EIS Sec. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Sec. 4.7.3.4 POD Att. I EIS App. F.2 LRMP Amendment RRNF-6
Soils: Landslide hazard evaluation will be used to assess potential mass wasting risk by the project. The Rogue Rover National Forest landslide, slope stability and hazard rating maps will be used to determine need for detailed slope stability mapping.	P	P, R	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 3.4.3 EIS Sec. 4.1.2.2 POD Att. I
Soils: Design management activities to return effective ground cover. The mineral soil exposure should not exceed the following limits overall, based on the erosion hazard rating of the soil type, as defined in the Rogue River National Forest Soil Resource Inventory: a. Forty percent mineral soil exposed on soils classed as very slight, slight, low or moderate erosion hazard soils; b. Thirty percent exposure on high or severe erosion hazard soils; c. Fifteen percent exposure on very high or very severe erosion hazard soils.	P	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 POD Att. I
Soils: Rehabilitate adversely impacted sites.	P, R	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 POD Att. I
Facilities: The Access Management Objectives Process, as described m Forest Service Handbook 7709 55, will be used to develop Road Design, Road Operation, Road Maintenance, and Off-Road Travel Criteria These in turn will be used to develop. a. Road and Trawl Design Elements, b. Road and Trawl Design Standards, c. Road Maintenance Levels, d. Road and Trail Maintenance Plans, e. Road Traffic Management Strategies, f. Road Restriction Orders and Traffic Control Devices, g. Off-road Vehicle Management Strategies, h. Travel Maps, and i. Closure Orders.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Facilities: Within sensitive soil resource Inventory land types, as shown in Management Strategy 21, the following guidelines apply. a. Geotechnical Input is required for road location, design, and management; b. Temporary roads will be planned, located, surveyed, designed, constructed and operated utilizing the same procedures for reviewing decisions, selecting design elements and standards, and controlling construction, operation, and maintenance as are used for permanent transportation system roads; and c. Roads which access or traverse these land types may be closed seasonally to prevent resource damage.	N		
Facilities: Temporary roads that have been evaluated through the NEPA process are permitted.	P	P, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y
Facilities: Roads that are no longer needed shall be obliterated and properly drained when they are taken out of service Vegetation shall be reestablished within one year.	P, R	P, B,	EIS Sec. 2.1.4 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. Y POD Att. DD
Protection: Plan pest control alternatives to be biologically selective, cost beneficial and to have no irreversible adverse effect on the environment.	N		
Protection: Aggressively suppress insects and diseases using the most cost-effective suppression strategies when outbreaks threaten resource management objectives Includes stump treatment for root rots, application of pesticides for defoliators and cone insects, etc., as necessary.	N		
Protection: Practice high intensity prevention activities such as monitoring pest populations to be forewarned of outbreaks, stump removal for root rots, stocking control, species selection for plantings, timely salvage of weather damaged timber, etc.	N		
Protection: Provide a moderate level of fire prevention activities consisting of: public contact through the use of media and personal contact at campgrounds and dispersed recreation areas; and fire prevention signing at campgrounds, rest areas, main road junctions, information centers and local businesses.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Protection: Maintain natural fuel loadings at a level which meets protection standards and resource objectives in a cost-efficient manner.	P, C, R, O	P, B,	EIS Sec. 2.1.4 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. K POD Att. R POD Att. DD
Protection: Treat activity fuels to a level which meets protection standards and resource objectives in a cost-efficient manner.	P, C, R, O	P, B	EIS Sec. 4.4.2.3 EIS Secs. 4.7.3.5 EIS App. F.4 POD Att. K POD Att. R
Protection: Hazard reduction activities will be compatible with management area objectives.	P, C, R, O	P, B	EIS Sec. 2.1.6 EIS Sec. 2.6.2 EIS Sec. 4.4.2.3 EIS Secs. 4.7.3.5 & 4.7.3.6 EIS App. F.2 EIS App. F.4 POD Att. R
Protection: Design fuel breaks to meet the natural characteristics of the area.	P, R	P, B,	EIS Sec. 2.1.4 EIS Sec. 4.7.3.6 EIS App. F.2 EIS App. F.3 POD Att. K POD Att. DD
Protection: Integrate fuel break construction with vegetation management projects.	N		
Protection: Conduct prescribed burning in such a manner that it will conform to applicable provisions of the Federal Clean Air Act, Oregon Smoke Management Plan and the Rogue River National Forest Smoke Management Plan.	N		
Protection: Each wildfire will have an appropriate response in accordance with the Rogue River National Forest Fire Management Policy and Plan.	N		
Timber Suitable 2 – Not Applicable, Excluded From Table			
Restricted Watershed 22 – Not Applicable, Excluded From Table			
Managed Watershed – Not Applicable, Excluded From Table			
Research Natural Areas – Not Applicable, Excluded From Table			
Restricted Riparian 26			

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Recreation - Roaded Natural: Manage the area for Retention Visual Quality Objective. Blend and shape regeneration openings with the natural terrain to the extent possible. Assess the impacts to visual resources in all project environmental analysis. Specifically address how the visual quality objective will be met.	N		
Recreation - Roaded Natural: Protect Special Dispersed Features, including trails, from adverse impacts until management of the special dispersed feature is addressed in an environmental analysis. The environmental analysis shall propose alternative management practices and mitigation measures where appropriate.	N		
Recreation - Roaded Natural: Allow for dispersed recreation activities such as dispersed camping, hunting, fishing and the gathering of forest products.	N		
Recreation - Roaded Natural: Manage trails and dispersed occupancy sites in a manner not in conflict with fisheries resource values.	N		
Recreation - Roaded Natural: Discourage or prohibit recreation use where public safety is threatened.	N		
Recreation - Roaded Natural: Identify the potential effect of any proposed activity on recreation opportunity spectrum classes in all project environmental analysis.	N		
Recreation - Roaded Natural: Restrict vehicle use to roads and trails except where prohibited.	N		
Recreation - Roaded Natural: Prohibit new developed recreation sites.	N		
Recreation - Roaded Natural: Portions of riparian areas suffering resource damage from recreation use will be rehabilitated and may be closed.	N		
Recreation - Roaded Natural: Investigate area to inventory archaeological, historical or other cultural resource properties which may be located within the proposed "area of effect" of projects or elsewhere. Document results of the investigation/ inventory in the project environmental analysis. Inventory of non-project areas will be guided by the Forest's cultural resource inventory strategy.	N		
Recreation - Roaded Natural: Evaluate the cultural resources found within the area using a qualified cultural resource specialist, to determine their potential archaeological, historical or cultural significance. Evaluate cultural resources on a project-specific basis or by thematic/multiresource group. If a cultural resource is discovered after project activity has begun, the activity will cease or be modified until an evaluation of significance can be made.	N		
Recreation - Roaded Natural: Assess the impacts of a proposed action to determine the effect of the project upon potentially or known significant cultural resources.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Recreation - Roaded Natural: Mitigate potential adverse impacts to significant cultural resources by redesigning the project to avoid damage or disturbance, or implementing appropriate mitigation procedures to reduce the adverse impact to the resource.	N		
Recreation - Roaded Natural: Inventory and protect cultural resources to insure that values are not damaged or destroyed until they can be evaluated for scientific study, interpretation or other appropriate uses. Protection of values may include maintenance of structures, avoidance of the site, or scientific removal, analysis and reporting.	N		
Recreation - Roaded Natural: Evaluate and enhance cultural resources for scientific, educational, recreational and ethnic use to the extent the integrity of the resource is maintained. Use will be carefully monitored.	N		
Recreation - Roaded Natural: Develop and administer schedules for long-range cultural resource management. Coordinate cultural resource management with appropriate State and Federal agencies.	N		
Recreation - Roaded Natural: Properties that meet the significance criteria will be treated as eligible to the National Register of Historic Places; eligible properties will be nominated to the National Register.	N		
Wilderness: This element is not applicable under a riparian strategy.	N		
Wilderness: Project plans will assure that Wilderness boundaries are not violated.	N		
Wildlife, Fish and Plants: Permit fish projects that enhance the resource values.	P, R	P,	EIS Sec. 2.1.4 EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.5.2.3 & 4.5.2.4 EIS Sec. 4.8.1.3 EIS App. F.2 POD Att. S POD Att. DD

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Resident Trout and Steelhead are selected species. The Clean Water Act establishes a level of aquatic resource management that will maintain the Forest's fisheries habitat at a level capable of sustaining or exceeding minimum viable populations for the various species of anadromous and resident fish. Cold water production for both on and off Forest fish needs is identified as a principal objective for the Forest's streams. Maintain existing fish habitat capability and develop fish habitat improvement projects to utilize fully potential smolt production capability of Forest anadromous streams and resident fish in other streams and lakes. Coordinate land management activities with the California Department of Fish and Game and Oregon Department of Fish and Wildlife objectives. Protect streams and lakes from detrimental changes in water temperature, blockages of water courses and deposits of sediment. Natural debris, plus trees needed for a future supply, will be maintained and managed to 1) enhance stream channel and bank structure so as to protect water quality, and 2) provide structural fish habitat to meet the objectives of small habitat capability or resident fish populations provided for in the Forest Plan.	P, C, R, O	P, B,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.5.2.3 & 4.5.2.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 EIS App. F.7 POD Att. DD
Wildlife, Fish and Plants: Endangered, threatened and sensitive species (and species proposed for Federal listing by USDA Fish and Wildlife Service [PETS]) will be identified and managed in cooperation with the USDI Fish and Wildlife Service, Oregon Department of Fish and Wildlife, Oregon Department of Agriculture, Oregon Natural Heritage Database, and California Department of Fish and Game.	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 EIS App. F.7 POD Att. J POD Att. DD
Wildlife, Fish and Plants: Legal and biological requirements for the conservation of listed and proposed endangered, threatened and sensitive plant and animal species shall be met. Habitat for existing federally-listed species shall be managed to achieve objectives of recovery plans.	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 EIS App. F.7 POD Att. J POD Att. DD
Wildlife, Fish and Plants: Biological evaluations (FSM 2672 4) shall be prepared for each project authorized, funded or conducted on the Forest. The biological evaluation shall be used to determine the possible effects the proposed activity will have on listed and PETS species. The biological evaluation consists of five steps. a. Pre-field review of existing information; b. Field reconnaissance of the project area, c. Determination of whether local populations of listed and PETS species will be affected by a project; d. Analysis of the significance of project effects on local and total populations of listed and PETS species, e. When step four cannot be completed due to lack of information, a biological or botanical investigation is conducted to gather the information needed to complete step four.	P, R	P,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 EIS App. F.7 POD Att. J POD Att. DD

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: If endangered, threatened or proposed species are found in a prefect area, consultation requirements with the USDI Fish and Wildlife Service shall be met in accordance with the Endangered Species Act (Public Law 93-205) and FSM 2671 4 No adverse Impacts on endangered, threatened or proposed species or their habitats shall occur except when It is possible to compensate adverse effects totally through alternatives identified in a biological opinion rendered by the USDI Fish and Wildlife Service (FSM 2670 31) Before a project can be carried out, protection or mitigation requirements shall be specified (NFMA, 36 CFR 219 27(a)(8)).	P, C, R, O	P, B, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 EIS App. F.7 POD Att. J POD Att. L POD Att. DD
Wildlife, Fish and Plants: If sensitive species are found in a project area, avoidance or other mitigation to minimize impacts to local populations shall be used for those species whose viability has been identified as a concern (FSM 2670.32). Maintaining viable populations of species throughout their geographic range (FSM 2670.22) shall be an objective during project planning. At a minimum, no action shall result in loss of species viability or create significant trends toward Federal listing (FSM 2670.32).	P, C, R, O	P, R,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Sec. 3.4.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 EIS App. F.7 POD Att. J POD Att. DD
Wildlife, Fish and Plants: Northern Spotted Owl - Manage this species under the standards and guidelines established in the ROD to the Supplement to the Environmental Impact Statement for an amendment to the Pacific Northwest Regional Guide. In the event that a pair of northern spotted owls are found in an area not identified prior to September 1, 1981, consideration will be given to (1) the need to improve the distribution of older forest ecosystems for all associated plant and animal species; (2) providing insight into management of spotted owl habitat areas (SOHA) through experimental habitat manipulation. If a nesting pair of owls is found during a scheduled timber sale or other activity outside a SOHA, a biological assessment for sensitive species will be made and protective measures will be instituted to protect the nest site until after fledging.	N		
Wildlife, Fish and Plants: Osprey - Protect active nests during the nesting season. Land management activities having adverse potential impact should not occur within a 20-chain radius of the nest from March 1 to August 31. Nest and perch trees will be protected until they are no longer usable.	N		
Wildlife, Fish and Plants: Goshawk - Nest sites will be protected from disturbing human activities during the nesting season. To maintain the physical suitability of nesting areas and prevent disturbances that may cause nesting failures, the period of protection will be from March 1 to August 31 for the area within 20 chains of an active nest.	N		
Wildlife, Fish and Plants: Goshawk - Each nest site is assumed potentially active until June 1. If monitoring has shown that no nesting attempt has been initiated or that a nesting attempt has failed by June 1, the nest site will be considered inactive and the above nest site restriction may be waived. Monitoring will be supervised and evaluated by a qualified wildlife biologist.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Goshawk - Goshawk nests will be protected within a 25-acre no-harvest buffer of trees unless other adjacent alternate buffers are available in a logical basis to maintain habitat over time.	N		
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Leave sufficient wildlife trees (hard snags or green trees designated to become snags) in coniferous forest lands to provide for at least 100 percent of the potential population levels for cavity nesting species. The distribution of numbers and size class necessary to meet 100 percent per 100 acres is as follows: Siskiyou and Cascade Mixed Conifer Size Number 15+ 298 17+ 60 25+ 5 Total 363 Siskiyou and Cascade True Fir Size Number 15+ 238 17+ 18 25+ 5 Total 261	P, C, R, O	P, R,	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 POD Att. P POD Att. U POD Att. DD EIS App. F.7

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Woodpeckers - (Cavity Nesters) Species distribution should be representative of the site's original stand. Trees selected for retention should maximize use of the stand's cull component. If the proper number and size of trees do not exist in the stand to be treated, select the proper number from the next lower size class (i.e. if 25" trees are not available go to 17" trees). Material that satisfies the need for down woody material recruitment will come from existing down material, down woody material that is the result of a silvicultural treatment and from the trees that are designated to meet standing wildlife tree requirements. The long-term goal for large woody material (LWM) is 10 to 20 pieces of class I and II logs per acre, and all existing class III, IV and V logs, except for incidental amounts removed during management activities. Additional green merchantable trees will not be designated unless none of the other categories exist. The expected life span of snags or dead trees in mixed conifer working groups is 30 years and in true fir working groups the life span is 20 years. The silvicultural prescription will describe the total number, size and species of wildlife trees that will be required through the next full rotation of the stand being treated. Wildlife and down woody material requirement will be included as part of the vegetative (silvicultural) prescription for each stand. Information for the prescription will be provided by a wildlife biologist based on site by site needs. A certified silviculturist will validate the data and include it in the preparation of the final vegetative (silvicultural) prescription that implements all the interdisciplinary requirements. The logging system required, reforestation needs, slash disposal requirements and site preparation needs should be compatible with the wildlife tree distribution needs. Primary cavity excavator habitat will be met on areas no larger than 60 acres including adjacent existing harvest units. The objective is to provide well distributed habitat, and to allow adjacent stands to provide the needed wildlife trees for past harvest units where current standards were not met. Where past harvest units were very large, the adjacent stands within 900 feet will be managed at higher wildlife tree levels to bring the overall area to at least the 40 percent level. When the past harvest units were of such magnitude that the above methods cannot bring the entire area to 40 percent level, the remaining shortage will not be provided for, but will be tracked for the purpose of monitoring the forest plan. Selection of wildlife trees to make up for past deficits will meet the same selection criteria as in newly treated stands. Green merchantable trees will not be girdled to create wildlife snags, regardless of the situation, until (5-7) years after project completion (sale closure), in order to capture any mortality that may occur during that time. Operational accomplishment will be included as a monitoring item in the forest plan.	P, C, O, R	P, B,	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 POD Att. P POD Att. U POD Att. DD EIS App. F.7
Wildlife, Fish and Plants: Deer and Elk - Maintain deer and elk summer range to provide forage, hiding and thermal cover. A restricted operating period from April 1 to June 30 may be imposed in identified deer or elk fawning or calving areas.	P, C, R, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3

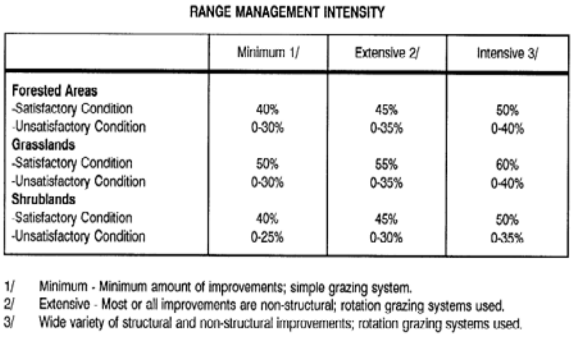
TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife, Fish and Plants: Bald Eagle - Develop a bald eagle site management plan for each nesting or roosting area as It is discovered Until a site specific management plan is developed, the following measures will apply Establish the primary nesting zone to be a 330 foot radius around the nest and the secondary zone to be a 660 foot radius around the nest The following activities should not occur within the nesting zones and communal roosting sates 1) Primary Zone All human related activities unless the activities pre-existed to nest discovery and the eagles are apparently tolerant, 2) Secondary Zone - Major land uses such as development of commercial and industrial sites, home, road, powerline or other construction, oil drilling, surface mining, and spraying of chemicals which adversely affect eagles. Timber cutting to enhance habitat is permitted but there is no scheduled timber harvest, 3) Primary and Secondary Zones between January 1 and August 15 - blasting, use of firearms, camping, picnicking, timber harvest, road and water access Into the nesting territory, and low level aircraft operations with helicopters no closer than 1,000 feet and with fixed wing no closer than 500 feet, 4) A communal roost is any stand of trees m which eagles regularly roost together. The primary zone for roosting eagles is 330 feet from the roosting trees and the secondary zone is one-quarter of a mile from the roosting trees. Large trees used as solitary roosts should be left along shoreline of lakes and streams wherever possible Biological evaluation and informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4
Wildlife, Fish and Plants: Peregrine Falcon - Develop a Peregrine falcon site management plan for each nesting area found The site plan design will be tailored to fit the landscape and the use patterns established by the birds. The following may be included in the Plan. 1) Delineate the nest site (eyrie), 2) Define primary (nesting) and secondary and tertiary zones associated with the eyrie, 3) Withdraw the nest site from mineral entry, 4) Restrict management activities and recreational use to September through January: 5) Allow no structural developments within the primary zone unless It benefits the species; 6) Maintain and/or enhance riparian habitats within a three-mile radius of the eyrie, 7) Develop water sources (springs, seeps, ponds, catchments) within approximately one-half mile radius of the eyrie, 8) Implement silvicultural prescriptions, prescribed fire or other management techniques to maintain a mosaic of all vegetative serial stages within the secondary and ternary zones (approximately a three-mile radius of the eyrie); 9) Direct special emphases towards maintaining and/or enhancing mast- and berry-producing shrubs and trees which support jays, bandtail pigeon and other passerine birds. Biological evaluation and Informal consultation with the U.S. Fish and Wildlife Service will be conducted for all potentially disturbing activities proposed within one mile of all nesting and roosting areas, within potential habitat, or as called for within site-specific management plans.	P	P, R	EIS Sec. 3.4.3 EIS Secs. 4.6.1.2 & 4.6.1.3 EIS Sec. 4.6.1.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7
Range: Livestock grazing will be permitted but will be managed to meet the goal of protecting the productivity of habitat values in riparian areas.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

<table>
<tr><th>Element</th><th>Applicable</th><th>Consistency</th><th>Comment</th></tr>
<tr><td>Range: Protecting and enhancing riparian area values will be addressed in each Allotment Management Plan as it is revised and/or updated. Specific objectives will be determined for riparian areas within grazing allotments. A measurable desired future riparian condition will be established based upon existing and potential vegetation conditions. When the current riparian condition is less than that desired, grazing systems and associated structural improvements will be designed and implemented to meet those objectives. Measurable objectives will be set for key parameters such as streambank stability, sedimentation, and vegetation condition. The Allotment Management Plan will describe the monitoring needed to determine if the desired rate of improvement is occurring.</td><td>N</td><td></td><td></td></tr>
<tr><td>Range: Allotment Management Plans currently not meeting Forest Plan direction will be revised on a priority basis under a schedule established by the Forest Supervisor.</td><td>N</td><td></td><td></td></tr>
<tr><td>Range: Prohibit salting within the management area.</td><td>N</td><td></td><td></td></tr>
<tr><td>Range: Develop Coordinated Resource Management Plans where possible and feasible to facilitate the integrated resource management of range and other resources, and between agencies, permittees and other landowners.</td><td>N</td><td></td><td></td></tr>
<tr><td>Range: Forage utilization standards will be incorporated in allotment management plans. Allotment management plans may include utilization standards which are lower or rarely higher when associated with intensive grazing systems and specific vegetation management objectives which will meet resource management objectives and the intent of the management strategy. The standards include cumulative annual use by big game and livestock. Utilization for grass and grasslike species is based on the percent of plant weight removed. Utilization for shrub species is based on incidence of use, weight, and/or twig length (e.g. utilization is 50 percent if 50 out of 100 leaders are browsed). Satisfactory condition is determined by allotment classification and/or forage condition. Unsatisfactory condition is anything not meeting satisfactory conditions. Allowable use of available forage (Maximum percent of annual utilization by big game and livestock) is:</td><td>N</td><td></td><td></td></tr>
<tr><td>


RANGE MANAGEMENT INTENSITY

<table>
<tr><th></th><th>Minimum 1/</th><th>Extensive 2/</th><th>Intensive 3/</th></tr>
<tr><td>**Forested Areas**</td><td></td><td></td><td></td></tr>
<tr><td>-Satisfactory Condition</td><td>40%</td><td>45%</td><td>50%</td></tr>
<tr><td>-Unsatisfactory Condition</td><td>0-30%</td><td>0-35%</td><td>0-40%</td></tr>
<tr><td>**Grasslands**</td><td></td><td></td><td></td></tr>
<tr><td>-Satisfactory Condition</td><td>50%</td><td>55%</td><td>60%</td></tr>
<tr><td>-Unsatisfactory Condition</td><td>0-30%</td><td>0-35%</td><td>0-40%</td></tr>
<tr><td>**Shrublands**</td><td></td><td></td><td></td></tr>
<tr><td>-Satisfactory Condition</td><td>40%</td><td>45%</td><td>50%</td></tr>
<tr><td>-Unsatisfactory Condition</td><td>0-25%</td><td>0-30%</td><td>0-35%</td></tr>
</table>

1/ Minimum - Minimum amount of improvements; simple grazing system.
2/ Extensive - Most or all improvements are non-structural; rotation grazing systems used.
3/ Wide variety of structural and non-structural improvements; rotation grazing systems used.
</td><td>N</td><td></td><td></td></tr>
</table>

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Timber harvest is not programmed and would normally not occur except for the following situations: to eliminate hazards, removal incidental to construction or maintenance of improvements, minor unavoidable inclusions to logical management units, or in the case of natural catastrophe, when removal of such timber is not detrimental to achieving the goals of the management area.	N		
Timber: Maintain vegetation characteristics needed for fish habitat and water quality protection. a. For areas normally dominated by trees, at least 80 percent of the normal tree crown cover will be retained over the length of the stream in the project area. The 80 percent figure was established to allow cross stream logging where logical. The intent of this is to cause less disturbance to watersheds by eliminating roads. b. An exception can be made for catastrophes. When shading vegetation along a stream is removed and creates an opening, recovery will be considered sufficient when the shade is reestablished. In all cases water temperatures must be maintained at acceptable levels.	N		
Timber: Maintain a blend of tree species approximating natural stands. In seed collections, no seed lot shall be represented by fewer than 15 families of trees of that species, well distributed across the breeding zone. In addition, no family of parent trees shall represent greater than 20 percent of a seed lot. Although any given plantation may be planted to a single species, strive for a natural seed source from a variety of species.	N		
Timber: Fuelwood and other miscellaneous forest products will be available only when consistent with riparian habitat management objectives.	N		
Timber: Rehabilitate and reconstruct developments and resources that have been impacted by timber sale activities.	N		
Timber: Utilization standards for timber harvested will meet the standards as stated in the Pacific Northwest Regional Guide, Standards and Guidelines 4-2 and in Table 3-6. Standards in timber sale contracts may vary depending on markets and costs of harvesting.	N		
Water: Evaluate effects of proposed projects on stream courses In all environmental analysis, Discuss pertinent stream classification and recommend changes where appropriate as a result of the environmental analysis.	P	P	EIS Sec. 2.4.2.2 EIS Sec. 4.3.2.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.7.3.5 EIS App. F.4 POD Att. I POD Att. CC

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Water: Comply with State requirements in accordance with the Clean Water Act of 1972, as amended (1977 and 1987) for protection of waters of the State of Oregon (Oregon Administrative Rules, Chapter 340-41), and the State of California (Porter-Cologne Water Quality Control Act, Division 7) through planning, application, and monitoring of Best Management Practices (BMPs) in conformance with the Clean Water Act of 1972, as amended (1977 and 1987), regulations, and federal guidance issued thereto.	P, C, R, O	P, B	EIS Secs. 1.4 EIS Sec. 1.5 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.6.1 & 2.6.2 EIS Secs. 4.3.2.2 & 4.3.3.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.7.3.5 EIS App. F.4POD Att. I POD Att. M POD Att. BB
Water: In cooperation with the States of Oregon and California, the Forest will use the following process. a. Select and design BMPs based on site specific conditions, technical, economic, and institutional feasibility, and water quality standards for those waters potentially impacted, b. Implement and enforce BMPs; c. Monitor to insure that practices are correctly applied as designed: d. Monitor to determent the effectiveness of practices in meeting design expectations and in attaining water quality standards: e. Evaluate monitoring results and mitigate where necessary to minimize impacts from activities where BMPs do not perform as expected: f. Adjust BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level Evaluate the appropriateness of water quaky criteria for reasonably assuming protection of beneficial uses. Consider recommending adjustment of water quality standards, g. Use the existing agreed to process to Implement the State Water Quality Management Plan on lands administered by the USFS as described In Memorandums of Understanding between. 1) the Oregon Department of Environmental Quality and US. Department of Agriculture, Forest Service (Z/12/79 and 12/7/82), and “Attachments A and 8’ referred to In this MOU (Implementation Plan for Water Quality Planning on National Forest lands in the Pacific Northwest 12/78 and Best Management Practices for Range and Grazing Activities on Federal lands) and 2) the State Water Resources Control Board, State of California, and US Department of Agriculture Forest Service, Pacific Southwest Region, 1981.	P, C, R, O	P, B	EIS Sec. 1.5 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.7.1 & 2.7.2 EIS Secs. 4.3.2.2 & 4.3.3.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.7.3.5 EIS App. F.4 POD Att. I POD Att. M POD Att. CC

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Water: The following requirements will be employed in protect implementation when proposed projects may affect streams. a. Determine restricted distance from streams for equipment operation, type of stream crossing, if crossing is needed, and erosion control methods, if needed, b. Locate springs that may be affected and evaluate for appropriate levels of protection. This would usually require consultation with soil, water or geology specialists, c. In project planning, consider basin constraint percentages by subwatershed as identified in the monitoring play for watersheds.	P, R	P, B, R, ,	EIS Sec. 2.1.4 EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.8 EIS Secs. 4.2.1.2, 4.2.2.2 & 4.3.3.2 EIS Secs. 4.6.3.4 & 4.6.3.5 EIS Sec. 4.7.2.5 EIS App. F.2 EIS App. F.4 POD Att. C POD Att. I POD Att. W POD Att. X POD Att. BB POD Att. DD
Water: Acquire water rights for development of non-reserved uses.	N		
Water: Allow watershed improvement projects. However, those which involve removal of debris from streams will normally be restricted to removal of man-caused debris only.	P, R	P,	EIS Sec. 2.1.4 EIS Sec. 4.6.3.5 EIS App. F.2 EIS App. F.4 POD Att. DD
Water: Design project water monitoring as appropriate.	P	P, B	EIS Secs. 2.3.2.1 & 2.1.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 2.7.1 & 2.7.2 POD Att. I POD Att. M POD Att. CC
Water: In-stream flows on National Forest lands should be protected through critical analysis of proposed water uses, diversion and transmission applications and renewal of permits.	N		
Water: Insure that proposed projects have no adverse effects on snow survey sates included in the Regional Forester's memorandum of understanding with the Soil Conservation Service.	N		
Minerals: Prohibit development of new, permanent aggregate sources	N		
Minerals: Prohibit expansion of existing aggregate sources.	N		
Minerals: Rehabilitate aggregate sources as they are closed.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Minerals: Under mining laws, claimants are entitled to access to their mining claims Access for exploration and development of locatable mineral resources will be analyzed in response to a proposed operating plan A decision on approval of reasonable access will be made as a result of appropriate environmental analyses.	N		
Minerals: Operating plans for mining operations will be processed In a timely manner in accordance with 36 CFR 228.	N		
Minerals: In plans of operation, require operationally feasible provisions designed to: protect riparian and fishery values; meet State water quality standards; and Insure that disturbed areas are reclaimed Insofar as practicable to a practicable condition.	N		
Minerals: Reclamation plans will Identify management objectives for disturbed areas and detail the procedures and time frames necessary to accomplish the objectives Reclamation bonds will be based on actual reclamation costs and formulated using technical and other resource Input.	N		
Human And Community Development: Conduct compliance reviews as required by Title VI of the Civil Rights Act of 1964, and established Forest Service standards.	N		
Human And Community Development: Inform the general public, including minorities and the underprivileged, of availability and benefits which they are eligible to receive from Forest programs. Techniques to Increase awareness and participation will be used.	N		
Human And Community Development: As directed by the American Indian Religious Freedom Act, the Forest will protect and preserve for Native Americans their inherent right of freedom to believe, express and exercise their traditional religions on Forest lands This includes, but is not limited to, access to ceremonial sites, use and possession of sacred objects, and the freedom to worship through traditional ceremonies and rites.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities compatible with interests of surrounding Indian tribes.	N		
Human And Community Development: Identify opportunities for the Forest to coordinate resource activities with the Interest of adjacent communities.	N		
Lands: Revise all special use permits to be constant with the direction in this management strategy when renewed.	N		
Lands: Utilize residual capacity in existing utility condors when applications for rights-of-ways from public or private entities are received. Analyze any additional corridors with an environmental analysis.	P	P, R	EIS Sec. 1.4 EIS Secs. 1.5 EIS Secs. 2.1.6 EIS Sec. 2.3.2.3 EIS Sec. 3.4.3
Lands: Insure that proposed projects do not have adverse effect on lands included in active exchanges.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Lands: Proposed projects are responsible for distinguishing boundaries between management areas with differing management objectives.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. U POD Att. T
Lands: Develop rights-of-ways as necessary to implement projects.	P, C, R, O	P, B, R,	EIS Sec. 1.4 EIS Sec. 1.5 EIS Sec. 2.1.6 EIS Sec. 2.3.2.3 EIS Sec. 3.4.3 EIS Sec. 4.7.3.4 POD Att. A POD Att. U POD Att. Y POD Att. BB
Lands: Establish and maintain property boundaries.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. U POD Att. T
Soils: Address the potential for detrimental soil displacement, compaction, puddling, severe burning, mass wasting and surface soil erosion in project environmental analysis.	P	P, B, A	EIS Sec. 1.5 EIS Secs. 2.1.3.4 EIS Sec. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Sec. 4.7.3.4 POD Att. I EIS App. F.2 LRMP Amendment RRNF-6
Soils: Alternative management practices will be developed or mitigating measures planned and Implemented when activities are likely to result m detrimental displacement, compaction, mass wasting or erosion.	P, R	P, B, ,	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 EIS Sec. 3.4.3 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Secs. 4.7.3.4 EIS App. F.2 POD Att. I POD Att. DD
Soils: No more than ten percent of an activity area to be compacted, puddled or displaced upon completion of project (not including permanent roads or landings). No more than 20 percent of the area should be displaced or compacted under circumstances resulting from previous management practices, Including roads and landings Permanent recreation facilities or other permanent facilities are exempt.	P, C, R	P, B, A	EIS Sec. 1.5.2.1 EIS Sec. 2.1.3.4 EIS Sec. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Sec. 4.7.3.4 POD Att. I EIS App. F.2 LRMP Amendment RRNF-6
Soils: Landslide hazard evaluation will be used to assess potential mass wasting risk by the project. The Rogue Rover National Forest landslide, slope stability and hazard rating maps will be used to determine need for detailed slope stability mapping.	P	P, R	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 3.4.3 EIS Sec. 4.1.2.2 POD Att. I

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Soils: Design management activities to retain effective ground cover. The mineral soil exposure should not exceed the following limits overall, based on the erosion hazard rating of the soil type, as defined in the Rogue River National Forest Soil Resource Inventory: a. Twenty percent mineral soil exposed on soils classed as very slight, slight, low or moderate erosion hazard soils. b. Ten percent exposure on high or severe erosion hazard soils. c. Seven percent exposure on very high or very severe erosion hazard soils.	P	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 POD Att. I
Soils: Rehabilitate adversely impacted sites.	P, R	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 POD Att. I
Facilities: The Access Management Objectives Process, as described m Forest Service Handbook 7709 55, will be used to develop Road Design, Road Operation, Road Maintenance, and Off-Road Travel Criteria These in turn will be used to develop. a. Road and Trawl Design Elements, b. Road and Trawl Design Standards, c. Road Maintenance Levels, d. Road and Trail Maintenance Plans, e. Road Traffic Management Strategies, f. Road Restriction Orders and Traffic Control Devices, g. Off-road Vehicle Management Strategies, h. Travel Maps, and i. Closure Orders.	N		
Facilities: Geotechnical input is required for road location, design, and management.	P	P	EIS Sec. 3.4.3 EIS Sec. 4.1.3.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. Y
Facilities: Temporary roads will be planned, located, surveyed, designed, constructed, and operated utilizing the same procedures for renewing, decisions, selecting design elements and standards, and controlling construction, operation, and maintenance as are used for permanent transportation system roads.	P	P, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y
Facilities: Roads may be closed seasonally to prevent resource damage.	P, C, O	P	EIS Sec. 2.4.2.1 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Facilities: Roads that are no longer needed shall be obliterated and properly drained when they are taken out of service Vegetation shall be reestablished within one year.	P, R	P, B,	EIS Sec. 2.1.4 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. Y POD Att. DD
Facilities: Off-Road Vehicles will be restricted to: a. Trails on which the use will neither damage the trail nor the soils. b. Roads closed to highway vehicles on which ORV use will neither damage the road nor the soils.	N		
Facilities: Over snow vehicle use of roads is acceptable when sufficient snow is present to close roads to highway vehicles.	N		
Facilities: Where existing roads or trails are adversely impacting water quality, steps will be taken to mitigate the problem.	P, C, O, R	P, B	EIS Sec. 2.1.4 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. Y
Facilities: Prohibit pit toilets, vault toilets, sewage disposal of any kind, and waste disposal of any kind within this management area.	P, C, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.7.2 POD Att. I POD Att. W
Facilities: Helispots and transmission corridors should be located outside this management area.	P	P, R, A	EIS Sec. 1.5 EIS Secs. 2.1.3.4 EIS Sec. 2.3.2.3 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS App. F.4 EIS App. F.2 LRMP Amendment RRNF-5
Protection: Suppress pests when outbreaks threaten managed resources and/or users. Use methods that minimize site disturbance.	N		
Protection: Plan pest control alternatives to be biologically selective, cost beneficial and to have no irreversible adverse effect on the environment.	N		
Protection: Permit the use of heavy equipment to construct firelines if it results in less total impact on the environment. A resource advisor should be appointed in all such situations to advise the incident commander on the location and standard of equipment work, and rehabilitation techniques.	N		

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Protection: Provide a moderate level of fire prevention activities consisting of: public contact through the use of media and personal contact at campgrounds and dispersed recreation areas; and fire prevention signing at campgrounds, rest areas, main road junctions, information centers and local businesses.	N		
Protection: Treat activity fuels to a level which meets protection standards and resource objectives in a cost-efficient manner.	P, C, R, O	P, B	EIS Sec. 4.4.2.3 EIS Secs. 4.7.3.5 EIS App. F.4 POD Att. K POD Att. R
Protection: Hazard reduction activities will be compatible with management area objectives.	P, C, R, O	P, B	EIS Sec. 2.1.6 EIS Sec. 2.6.2 EIS Sec. 4.5.2.3 EIS Secs. 4.7.3.5 & 4.7.3.6 EIS App. F.3 EIS App. F.2 EIS App. F.4 POD Att. R
Protection: Use prescription fire to obtain the desired ecological characteristics of the area.	P, C, R, O	P, B	EIS Sec. 2.1.6 EIS Sec. 2.6.2 EIS Sec. 4.4.2.3 EIS Secs. 4.7.3.5 & 4.7.3.6 EIS App. F.2 EIS App. F.3 EIS App. F.4 POD Att. R
Protection: Provide for a protective strip of undisturbed surface between the prescribed burn area and specified water courses, considering local topographic, vegetative and soil characteristics.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Secs. 4.5.2.3 & 4.5.2.4 EIS Sec. 4.7.3.5 EIS App. F.4 POD Att. I POD Att. R
Protection: Avoid high intensity prescribed fires on soils that are highly erodible and/or are subject to the development of hydrophobic (non-wettable) conditions.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 4.2.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 POD Att. I POD Att. R
Protection: Construction and maintenance of fuel breaks will be permitted provided low impact methods such as hand tools are used.	P, R	P, B,	EIS Sec. 2.1.4 EIS Sec. 4.7.3.6 EIS App. F.2 EIS App. F.3 POD Att. K POD Att. DD

TABLE 2.2-1

Rogue River National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Protection: Conduct prescribed burning in such a manner that it will conform to applicable provisions of the Federal Clean Air Act, Oregon Smoke Management Plan and the Rogue River National Forest Smoke Management Plan.	P, C, R, O	P, B	EIS Sec. 1.5 EIS Sec. 2.4.2.1 EIS Sec. 2.7.2 EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Sec. 4.4.2.3 EIS Secs. 4.7.3.5 & 4.7.3.6 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 EIS App. F.2 EIS App. F.3 EIS App. F.4 POD Att. I POD Att. R

2.3 WINEMA NATIONAL FOREST LAND AND RESOURCE MANAGEMENT PLAN - 1990

Project Consistency with this LRMP is addressed in Table 2.3-1 below.

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Air Quality			
Management activities shall be planned to maintain air quality at a level adequate for the protection and use of the national forest resources and to meet or to exceed applicable Federal and State standards and regulations (36 CFR 219.27[a][12]).	P	P	EIS Sec. 1.5 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 POD Att. B
The Forest shall coordinate with the appropriate air quality regulatory agencies. Prescribed burning operations shall comply with the procedures identified in the Smoke Management Operations Plan (Oregon State Forestry Directive 1-4-1-601).	P, C, O	P, B	EIS Sec. 1.5 EIS Sec. 4.4.2.3 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 POD Att. B POD Att. I POD Att. R
The Forest shall demonstrate reasonable progress in reducing total suspended particulate (TSP) emissions from prescribed fire.	N		
The best available predictive methods and models and the most cost efficient technology should be used to minimize the impact of prescribed burning on smoke-sensitive areas and designated Federal Class I areas.	P, C, O	P, B	EIS Sec.4.4.2.3 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 POD Att. B POD Att. I POD Att. R

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Three basic strategies may be used to manage prescribed fire smoke: reduction, dilution, and avoidance. The strategy of reduction focuses on reducing the amount of smoke (particulates) produced by increasing the efficiency of burning and reducing the amount of fuel consumed by fire. This may be accomplished by such methods as: 1. Increasing wood utilization standards and the continued use of WM and PUM specifications (yarding or piling unmerchantable material), consistent with the objectives for large woody materia1,'in timber sale contracts. 2. Specifying logging methods that reduce timber breakage and minimize creation of unmerchantable debris (for example, directional felling and tree lining). 3. Selecting fuel moisture parameters that reduce the total consumption of fuel and reduce the smoldering phase of combustion. 4. Selecting ignition (fire-starting) methods and techniques that lower TSP production. 5. Utilizing alternative slash treatment methods, such as chipping or burying, in place of prescribed fire. 6. Requiring, where feasible, prompt and vigorous mop-up (extinguishing remnant traces of fire to prevent its recurrence) 7. Increasing the air supply to slash piles and burn bays (specially created areas along roads for accumulating and treating slash). 8. Changing the merchantability specifications of logs.	P, C, O	P, B	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 POD Att. I POD Att. K POD Att. R POD Att. U
Three basic strategies may be used to manage prescribed fire smoke: reduction, dilution, and avoidance. The third strategy, avoidance, may also be used in a Forest smoke management program. This strategy involves the selection of on-site and meteorological conditions that will put the smoke either up and over smoke-sensitive areas or away from these areas. Practices that may be followed include: 1. Burning when wind direction is favorable to avoid smoke-sensitive areas. 2. Selecting a combination of burning prescription parameters to generate an elevated plume that exceeds the ceiling of the smoke-sensitive area and then moves quickly over or away from the area 3. Using the combination of terrain elevation and inversion layers to prevent smoke from settling into sensitive areas.	P, C, O	P, B	EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 POD Att. R
Public understanding of prescribed fire and smoke management will be most helpful in ensuring that any one of the strategies, or a combination of strategies, is successful. Some measures that may be employed include: 1. Educating the public as to the objectives of prescribed fire use in the local environment, the steps taken to reduce smoke, and how smoke is managed. 2. Informing the public before the ignition of potentially troublesome units	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Coordination with other local agencies that also are responsible for maintaining air quality is a key in ensuring a viable air quality maintenance program for the Forest Some measures that may be taken to ensure overall air quality are: 1. Cooperating with local air pollution authorities in monitoring activities that may result in new or modified sources of emissions which may impact Class I areas. 2. Completing review of any air quality studies that are part of new source permits.	N		
Cultural Resources			
The Forest will comply with all applicable legal requirements for management of cultural resources, including the National Historic Preservation Act of 1966, the National Environmental Policy Act of 1969, the American Indian Religious Freedom Act of 1978, and the Archaeological Resources Protection Act of 1979.	P, C, O	P, B, R	EIS Sec. 1.5 EIS Secs. 4.11.1.1 – 4.11.1.3 EIS Secs. 4.11.3.3 EIS Sec. 4.11.5 POD Att. Z
The Forest cultural resource overview shall be maintained and updated.	N		
A cultural resource inventory program will be conducted under the supervision of a professional archaeologist on a project-specific level before ground-disturbing activities occur, in compliance with applicable Federal historic preservation legislation. The results of project-level cultural resource inventories shall be documented in a cultural resource report and in the project planning records.	P	P	EIS Sec. 1.5 EIS Sec. 4.11.2 EIS Secs. 4.11.3.2 & 4.11.3.3 EIS Sec. 4.11.5
The significance of inventoried sites shall be evaluated by applying the criteria for eligibility to the National Register of Historic Places; qualifying sites ('eligible' cultural resources) should be nominated.	P	P	EIS Sec. 1.5 EIS Sec. 4.11.1.1 EIS Sec. 4.11.2 EIS Secs. 4.11.3.2 & 4.11.3.3 EIS Sec. 4.11.5
The effects of all management activities on significant cultural resources shall be considered, and measures shall be developed to avoid or mitigate any adverse effects. Measures shall be developed in consultation with the Oregon State Historic Preservation Officer (SHPO) and, if necessary, the National Advisory Council to protect significant sites from adverse effects due to ground-disturbing project activities	N		
Eligible cultural resources will be considered for protection from degradation due to vandalism, unauthorized public use, and natural deterioration. They should be monitored by means of a recurring inventory to assess whether their condition has been affected by vandalism, unauthorized use, and natural deterioration. Stabilization or rehabilitation may be carried out on significant sites which have been damaged.	N		
Antiquities permits may be issued to qualifying academic institutions or other organizations and individuals for the study and research of cultural resource sites.	N		
Suitable cultural resource properties may be interpreted for the recreational use and educational benefit of the general public. Preferred methods include brochures, signs, displays, interpretative trails, tours, and video or slide programs.	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Any long-term management of cultural resources shall be coordinated as necessary with the State Historic Preservation Office, the Klamath Tribe, and other groups or individuals.	P, C, O	P, R	EIS Sec. 1.5 EIS Secs. 4.11.1.1 – 4.11.1.3 EIS Secs. 4.11.3.3 EIS Sec. 4.11.5 POD Att. Z
Cultural resources shall be managed according to the following priorities: Non impactive data collection (including mapping, photo documentation, and reporting) to preserve cultural resources for future scientific study and to guide development of the cultural resource program.	N		
Cultural resources shall be managed according to the following priorities: Encouragement of understanding and ownership of the cultural resource program through public information efforts with special emphasis for members of the Klamath Tribe and local publics.	N		
Cultural resources shall be managed according to the following priorities: Adaptive use of historical structures by considering them for interpretative purposes; for example, administrative sites, residences, and interpretative centers.	N		
Cultural resources shall be managed according to the following priorities: Adherence to a consultation process with the Klamath Tribe, recognizing the tribe's interest in sites related to Its tribal history.	N		
Cultural resources shall be managed according to the following priorities: When cultural resource sites are damaged, controlled data recovery by means of testing, excavating, and analyses will be done in consultation with the Klamath Tribe.	N		
Management of culturally significant, traditional use, and religious sites shall be coordinated with the Klamath Tribe. Information about planned project activities shall be presented to the Klamath Tribe for coordination concerning effects on these sites.	N		
Facilities			
Transportation System: Development and management of the Forest transportation system shall be in accordance with an approved transportation system plan. This plan shall be the official description of the transportation system. The plan consists of a series of base maps showing the location of each facility and an inventory record defining their characteristics.	P, C, O, R	P, B, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y POD Att. DD

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Transportation System: Management of the Forest transportation system shall be in accordance with an approved Forest road management plan The purpose of this plan is to determine the proper combination of development, traffic management, and maintenance of the existing road system to meet the management area objectives the best. This plan shall contain specific road management objectives, multiyear development plans, traffic management and maintenance plans, and the road plans of other agencies.	P, C, O	P, B	EIS Sec. 4.10.2.6 POD Att. Y
Transportation System: Temporary roads may be constructed where there is a one-time need for a transportation facility. After the need is fulfilled, the road shall be closed and returned to vegetative production. Temporally roads left from past activities shall be evaluated as they are encountered during project-level analysis	P, C, R, O	P, B, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y
Transportation System: Roads shall be constructed and maintained to the standards and levels necessary to meet the resource management objectives.	P, C, O	P, B	EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y
Transportation System: All roads shall have approved road management objectives contained in the road management plan. These objectives state the intended purpose of the road; the resource objectives sewed; and the selected design, maintenance, and operation criteria that apply to the road.	P	P	EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. Y
Transportation System: Road construction, reconstruction, maintenance, and signing shall be in accordance with management area objectives, and should meet recognized engineering standards contained in Forest Service manuals, design handbooks, and other technical guides.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y
Transportation System: Existing roads not needed for future transportation purposes shall be closed and returned to vegetative productivity.	P, R	P,	EIS Sec. 2.1.4 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.2 POD Att. Y POD Att. DD
Transportation System: Whenever practical, roads should be located in areas with the lowest erosion potential.	P	P, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 4.1.2.1 & 4.1.2.2 EIS Secs. 4.2.2.1 & 4.2.2.5 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. Y
Transportation System: Road construction activities shall be scheduled to minimize soil erosion when heavy rain or heavy surface runoff is most likely to occur.	P, C, O	P	EIS Sec. 2.4.2.1 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Transportation System: Where existing roads or trails are affecting air and water quality, steps should be taken to mitigate the problem.	C, O		EIS Sec. 2.1.4 EIS Sec. 4.7.3.5 EIS Sec. 4.10.2.6 EIS App. F.2 EIS App. F.4 POD Att. Y POD Att. DD
Transportation System: Road drainage shall be designed and maintained to minimize road runoff sediment directly into riparian areas	P, C, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 4.7.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.4 POD Att. I POD Att. Y
Transportation System: Culverts or bridges shall be of adequate size to accommodate anticipated high stream flows and fish passage.	P, R	P,	EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Sec. 4.7.3.5 EIS Sec. 4.10.2.6 EIS App. F.2 EIS App. F.4 POD Att. Y POD Att. BB POD Att. DD
Transportation System: Stream crossings should not change floodplain or stream flow characteristics.	P, C, R, O	P, B,	EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Sec. 4.7.3.5 EIS App. F EIS App. F.4EIS App. F.4 POD Att. BB POD Att. DD
Transportation System: Stream crossing construction shall be scheduled during low stream flow and/or outside spawning periods.	P, C, R, O	P,	EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. BB POD Att. DD
Transportation System: Traffic management shall be considered as an alternative to road reconstruction when the existing facility is inadequate for mixed traffic.	N		
Transportation System: All new major transportation and utility facilities should be placed within or beside existing corridors to the extent practicable.	P	P, R,	EIS Sec. 2.3.2.3 EIS Sec. 3.4.3 EIS Sec. 4.7.3.4 EIS Sec. 4.10.2.6

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Transportation System: Road construction or reconstruction activities within an existing utility corridor shall be coordinated with the appropriate utility company to determine which precautions are necessary to safely cross the corridor.	P, C, O	P	EIS Secs. 2.3.2.1 EIS Sec. 2.4.2.2 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. Y
Transportation System: Existing roads not needed for access should be closed until access is required. Roads should be closed based on one or all of the following criteria: (1) need to protect the road, soil and water, or wildlife; (2) expected access need or road use; (3) safety of expected users; (4) need to protect cultural resources; (5) need to maintain or improve habitat effectiveness for wildlife; (6) need to provide planned recreation experience opportunities; and (7) reduction in road maintenance costs.	N		
Administrative Sites – Site Planning: An approved site development plan must be completed before expenditure of funds on new construction or additions to existing structures, including utilities.	N		
Administrative Sites – Site Planning: New facilities and additions to existing facilities shall be designed to provide barrier-free access.	N		
Administrative Sites – Construction, Reconstruction, and Operational Management: Acquisition, use, and disposal of Forest facilities (including historic structures) shall be in accordance with an approved facilities master plan.	N		
Administrative Sites – Construction, Reconstruction, and Operational Management: Design standards shall be based on site management objectives, including environmental constraints, user safety, national and local uniform building codes, traffic requirements and economics.	P	P, B	EIS Sec. 2.4.2.3 POD Att. I
Administrative Sites – Construction, Reconstruction, and Operational Management: All new sites shall be planned, constructed, and managed to provide the anticipated uses safely with a minimum impact to adjacent uses and landowners. Completed projects shall include provisions for reducing adverse environmental effects of sight, sound, odor, and drainage.	P, C, O	P, B	EIS Sec. 2.4.2.3 EIS Sec. 2.7.3 POD Att. I
Administrative Sites – Construction, Reconstruction, and Operational Management: Site or structure closures may be implemented to meet health and safety needs or to reduce damage and maintenance costs.	N		
Administrative Sites – Construction, Reconstruction, and Operational Management: Facility condition surveys shall be conducted to determine maintenance needs and to identify needed corrective actions.	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Administrative Sites – Construction, Reconstruction, and Operational Management: Building maintenance funds and quarters collections will be allocated to cover operation, maintenance, and management proposals for facilities, and shall be guided by the following: (1) health and safety--hazard elimination; (2) prevention of further deterioration--of facilities, grounds maintenance, and other site improvement; (3) program support maintenance that contributes to increased resource production and/or decreased unit costs for projects; (4) energy conservation; and (5) compliance with other laws and regulations.	N		
Administrative Sites – Construction, Reconstruction, and Operational Management: Protection, stabilization, preservation, rehabilitation, restoration, and reconstruction of buildings and structures that are on, or have been nominated to, the National Register of Historic Places shall follow the Secretary of the Interior's standards for historic preservation projects.	N		
Administrative Sites – Temporary Structures: Construction of 'temporary facilities' should normally be discouraged. Structures planned and constructed as 'temporary' shall be removed or obliterated when the need is satisfied. Methods used and timing should be in accordance with the project plan. Structures that subsequently are needed for additional use or are not removed or obliterated as planned shall be included in the site plan.	N		
Fish, Wildlife, and Sensitive Plants			
At the Forest level, fish and wildlife habitat shall be managed to maintain viable populations of all existing native and desired non-native plant and animal species. Distribution of habitat shall provide for species viability and maintenance of populations throughout their existing range on the Forest.	P, C, R, O	P, R,	EIS Sec. 2.1.4 EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.5.2.3 & 4.5.2.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.2 EIS App. F.3 EIS App. F.7 POD Att. J POD Att. DD
Endangered, Threatened, or Sensitive Species: Endangered, threatened, and sensitive species shall be identified and managed in cooperation with the USDI Fish and Wildlife Service, Oregon Department of Fish and Wildlife (animals), and Oregon Department of Agriculture (plants). Legal and biological requirements for the conservation of endangered and threatened species and species proposed for listing as threatened or endangered status shall be met.	P, C, R, O	P, B, R	EIS Sec. 1.5 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 POD Att. J

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Endangered, Threatened, or Sensitive Species: Habitat for existing federally classified threatened and endangered species shall be managed to achieve objectives of recovery plans.	P, C, O	P, R	EIS Sec. 1.5 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS Sec. 4.7.3.5 & 4.7.3.6 EIS App. F.2 EIS App. F.3 EIS App. F.4 EIS App. F.7 POD Att. J
Endangered, Threatened, or Sensitive Species: All Forest Service projects, programs, and activities conducted, funded, or permitted shall be reviewed for possible effects on threatened, endangered, and sensitive species of animals and plants.	P	P	EIS Sec. 1.5 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS Secs. 4.7.3.5 & 4.7.3.6 EIS App. F.2 EIS App. F.3 EIS App. F.4 EIS App. F.7 POD Att. J
Endangered, Threatened, or Sensitive Species: Biological evaluations shall be prepared for each project authorized, funded, or conducted on National Forest System land to determine the possible effects the proposed activity will have on endangered, threatened, proposed, or sensitive species.	P	P	EIS Sec. 1.5 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 POD Att. J
Endangered, Threatened, or Sensitive Species: If endangered, threatened, or proposed species are found in a project area, consultation requirements with the USDI Fish and Wildlife Service shall be met in accordance with the Endangered Species Act (Public Law 93-205). Before a project can be carried out, protection or mitigation requirements shall be specified (NFMA, 36 CFR 219.27[a][8]).	P, C, O	P, B, R	EIS Sec. 1.5 EIS Secs. 2.1.4 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 POD Att. J POD Att. L
Endangered, Threatened, or Sensitive Species: Lists of endangered, threatened, and sensitive plant and animal species shall be maintained and updated periodically as new information is collected. Pertinent information shall be submitted to the Regional Office for updating the Regional Forester's Sensitive Species Lists and to the appropriate agencies for inclusion in statewide data bases.	N		
Endangered, Threatened, or Sensitive Species: Forest personnel shall not identify (to the public) specific location information that could, jeopardize the welfare of an endangered, threatened, proposed, or sensitive species.	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Endangered, Threatened, or Sensitive Species: Habitat use of the Winema National Forest by these species shall be evaluated. Habitat requirements sufficient to maintain the species shall be provided.	P	P, R	EIS Sec. 1.5 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS Secs. 4.7.3.5 & 4.7.3.6 EIS App. F.2 EIS App. F.3 EIS App. F.4 EIS App. F.7 POD Att. J
Endangered, Threatened, or Sensitive Species: Where appropriate, standards and guidelines developed by the Oregon Department of Fish and Wildlife may be used for species that are considered sensitive by ODFW and that are on the Regional Forester's Sensitive Species List.	P, C, R, O	P, B	EIS Sec. 1.5 EIS Sec. 4.6.3.2 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 POD Att. J
Endangered, Threatened, or Sensitive Species: Where appropriate, standards and guidelines developed by the Klamath Tribe may be used for species that are considered to have traditional cultural significance to the Klamath Tribe.	N		
Raptors and Colonial Nesting Birds: Active roost and nest sites (including rookeries) shall be protected from disturbing human activities during their respective nesting seasons. Table 4-12[18] indicates protection zones and nesting and roosting seasons of some important bird species on the Winema National Forest. Each nest site is assumed potentially active until June 1. If monitoring has shown that no nesting attempt has been initiated or that a nesting attempt has failed by June 1, the nest site will be considered inactive, and nest site restrictions may be waived. Monitoring will be supervised and evaluated by a qualified wildlife biologist. Site management guides shall be developed for all consistently occupied (more than two years) nest sites, roosts, and rookeries	P, C, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.4.1 - 4.6.4.4 EIS App. F.2 EIS App. F.7
Deer and Elk Habitat: Deer (mule and black-tailed deer) habitat shall be managed, considering all factors such as roads, cover, forage, water distribution, and livestock competition so that habitat capability to support deer is maintained or improved. On limited site-specific instances, short-term decreases (less than 10 years) are acceptable to achieve long-term benefits. Effects shall usually be calculated for projects on areas ranging from 8,000 to 60,000 acres. Habitat suitability models, such as the Interagency Technical Advisory Committee Mule Deer Model, 1985 as amended, may be used in projects such as but not limited to timber sales, grazing plans, road construction and water development.	P, C, R, O	P, B, R	EIS Secs. 4.5.1.2 & 4.5.1.3

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[18] Table 4-12: Important Wildlife Nesting and Roosting Seasons and Required Protection Zones, Winema Land and Resource Management Plan

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Deer and Elk Habitat: Road access will be restricted and human activities will be discouraged between May 1 and June 30 in areas that have been identified as having traditional elk calving, only an area on the north end of Klamath District has been identified. Migration corridors of continuous coniferous cover no less than 600 feet wide will be retained to access calving areas as they are identified. Riparian areas and old-growth areas may contribute to migration corridors. As other elk calving areas are identified, this standard will be applied.	P, C, O	P	EIS Secs. 4.5.1.2 & 4.5.1.3
Deer and Elk Habitat: With the exception of calving areas, habitat east of Highway 97 will not be managed specifically for elk until completion of a cooperative elk study and the cooperative development of elk management guidelines.	P	P	EIS Secs. 4.5.1.2 & 4.5.1.3
Deer and Elk Habitat: The Forest shall provide a minimum of 30 percent of Its area as cover for deer. Generally 15 percent of the area will be hiding cover, 10 percent will be thermal cover, and 5 percent will be cover for fawning. Whenever possible, all cover also will be hiding cover. A short-term (10-year) reduction of cover to 15 percent of an area may be justified on a project-specific basis if reduction below 30 percent cover will provide long-term (greater than 10 years) benefits for deer.	P	P	EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Secs. 4.5.1.2 & 4.5.1.3
Deer and Elk Habitat: To provide adequate diversity of forage structure for deer, activities shall be planned to achieve multiple age classes in the brush vegetative component.	P	P	EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Secs. 4.5.1.2 & 4.5.1.3
Deer and Elk Habitat: Wildlife forage will be allocated firstly to meet the needs of big game, secondly to meet the needs of other animals.	P	P	EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Secs. 4.5.1.2 & 4.5.1.3
Fish and Aquatic Habitat: Streams shall be managed to maintain or to improve the present level of native fish habitat capability. Stream inventories shall be maintained and updated to: assess habitat capability; monitor changes due to natural or management-related events; and identify opportunities for rehabilitation or enhancement.	P, C, R, O	P, B,	EIS Sec. 2.1.4 EIS Secs. 2.4.2.2 & 2.4.2.3 EIS Sec. 4.5.2.4 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. BB POD Att. DD
Fish and Aquatic Habitat: Fisheries habitat enhancement shall be conducted according to Forest basin priorities. Basin priorities and plans should be prepared in cooperation with the Klamath Tribe and the Oregon Department of Fish and Wildlife. The plans will evaluate the current condition of habitat, fish populations, opportunities for enhancement, and the associated costs and benefits. Enhancement projects shall be monitored to evaluate effectiveness. Emphasis will be placed on maintenance or improvement of spawning, rearing, and migration habitats.	P, R	P, B,	EIS Sec. 1.5.4.4 EIS Sec. 2.1.4 EIS Sec. 4.5.2.4 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. DD

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife Tree (Snag) Habitat: Habitat capability for woodpeckers (indicators for cavity-nesting species) shall be continually maintained throughout the Forest at not less than 40 percent of potential population levels (Thomas et al1979) in all forested lands except lodgepole pine. In lodgepole pine, the decrease in large diameter trees because of catastrophic mountain pine beetle infestation may preclude achieving the 40 percent level. In lodgepole pine, the highest potential population level possible shall be achieved up to the 40 percent level. With the possible exception of lodgepole pine. This will result in maintenance of self-sustaining populations of cavity-nesting species.	P, C, O	P, R	EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS App. F.7 POD Att. P POD Att. U
Wildlife Tree (Snag) Habitat: In new sale areas, additional individual wildlife trees or wildlife tree clumps shall be left to offset lower numbers in older units in the vicinity. In these situations, the objective is to maintain an average 40 percent habitat level within as small an area as feasible (such as a small drainage basin).	N		
Wildlife Tree (Snag) Habitat: Established for forests in Region 6, wildlife tree management standards shall be followed (1920/2600 letter from Regional Forester dated September 9, 1988). This direction provides, in part, that snag densities needed to meet Management Requirement direction for cavity excavators must be provided within land areas that are generally no larger than normal unit size (not more than 40 acres). These densities will be maintained through the full rotation on these areas by providing for green replacement trees that will become snags of adequate size when existing snags fall.	P, C, O	P, R	EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.6.4.1 & 4.6.4.2 EIS Sec. 4.6.4.4 EIS Sec. 4.7.3.6 EIS App. F.2 POD Att. P POD Att. U
Wildlife Tree (Snag) Habitat: Tables 4-13[19] and 4-14[20] should be used to meet the 40 percent habitat capability level. Table 4-13[2] identifies the number of acres of clumps needed to produce snags at the 40 percent level per 40 acres based on the Forest average for major timber working groups from the timber inventory. Table 4-14[3] identifies the number of snags and green trees needed per 40 acres to meet the objective 40 percent level.	N		
Wildlife Tree (Snag) Habitat: Snags with the largest diameter breast height (DBH) last longer and make the best wildlife habitat, and should be selected whenever possible. However, wildlife trees that will continue to grow for another 30 years to 35 years before becoming snags may be of smaller diameter than those which die at the beginning of a rotation. Snags with diameters (DBH) over 20 inches meet the standard and guideline for large woody material.	P	P, R	EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.7.3.6 EIS App. F.2

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[19] Table 4-13: Estimated Acres for Each 40 Acres to Produce a 40 Percent Potential Population Level for Cavity Nesters, Winema Land and Resource Management Plan

[20] Table 4-14: Number of Snags and Greet Trees for Each 40 Acres to Produce a 40 Percent Potential Population Level for Cavity Nesters, Winema Land and Resource Management Plan

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Wildlife Tree (Snag) Habitat: Wildlife trees designated in riparian areas may be counted toward snag objectives only if they are excess to those needed to provide shade in stream corridors (essential shade trees shall not be killed to provide snag habitat) or large woody debris requirements.	P, C, O	P, B	EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Sec. 4.7.3.5 EIS App. F.4 POD Att. P POD Att. U
Wildlife Tree (Snag) Habitat: Wildlife trees should be clumped where this technique is usable and feasible and meets the 40 percent standard. Individual trees may be used If stand conditions preclude clumping and safety considerations are met.	P	P, R	EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.7.3.5 & 4.7.3.6 EIS App. F.2 EIS App. F.4 POD Att. P POD Att. U
Wildlife Tree (Snag) Habitat: Designated wildlife trees or wildlife tree clumps shall be protected from woodcutting and Forest management activities.	P, C, O	P, B, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Secs. 4.5.1.2 & 4.5.1.3 POD Att. P POD Att. U
Dead and Down Woody Material: Class I or II logs shall be left to maintain dead and down woody material habitat. This material shall be left in the following numbers and size classes by working group. 1. Ponderosa Pine: two or more logs/acre, 12 inches or greater diameter at the small end, greater than 8 feet long. 2. Pine Associated: SM or more logs/acre, 12 inches or greater diameter at the small end, greater than 8 feet long. 3. Mixed Conifer: six or more logs/acre, 12 inches or greater diameter at the small end, greater than 8 feet long. 4. Lodgepole Pine: 10 or more logs/acre, 6 inches or greater diameter at large end, greater than 8 feet long.	N		
Dead and Down Woody Material: Charring of down material should be minimized in prescribed burning where practicable. The suitability of logs as vertebrate and invertebrate habitat is reduced by charring.	P, C, O	P, B	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 POD Att. I POD Att. R
Dead and Down Woody Material: Live or dead standing trees shall be left to become down material when Class I and II logs are not available on the ground. Since these live or dead trees will become dead and down woody material habitat, they must be in addition to the snag or green tree replacement habitat requirements.	P, C, O	P, B	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 EIS Secs. 4.7.3.5 & 4.7.3.6 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. P POD Att. U

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Dead and Down Woody Material: To provide habitat for small animals, at least one pile of slash or natural piles of limbs shall be retained per acre. Slash piles should be at least 3 feet in height and 6 feet in diameter.	C, O	B	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.1 EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Secs. 4.5.1.2 & 4.5.1.3 POD Att. I POD Att. U
Cliffs, Caves, and Talus Habitat: Individual projects shall be designed to protect the value of cliffs (including rimrock), caves, and talus habitat for wildlife. Protection shall include vegetative protection zones: at least 200 feet adjacent to cliff, cave, and talus habitat receiving nesting or denning use by mammals; and at least 200 feet adjacent to this habitat receiving nesting or rearing use by birds.	P	P, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 2.4.2.2 EIS Sec. 4.4.1.3 EIS Sec. 4.5.1.3
Cliffs, Caves, and Talus Habitat: Rock quarries should be located at sites exhibiting the least desirable characteristics as wildlife habitat.	N		
Hardwood Habitat: Maintain or enhance hardwood (aspen and cottonwood) production on the Forest. Maintain a variety of hardwood age classes on the Forest. Hardwood stands mixed with conifers make a substantial contribution to visual, wildlife habitat, and vegetative diversity.	N		
Meadows: Protect and enhance meadows as a forest habitat component. Protection and enhancement includes stopping or reversing forest tree encroachment. A buffer of shrub or tree vegetation may need to be preserved on the perimeter of the opening.	N		
Miscellaneous Wildlife Sites: During the life of this Forest Plan, habitat sites will be found. These sites will have special value for wildlife or botanical resources, and are not otherwise addressed in the standards and guidelines. Management of these sites should be dealt with individually as part of the environmental analysis process for specific management activities. Each Ranger District shall maintain a list of sites to be considered for special management consideration as Wildlife or Botanical Sites at the next revision of the Forest Plan	N		
Plant Collecting (Including Sensitive Species): Federally listed threatened and endangered species are protected by the Federal Endangered Species Act (1982 amendments). The Forest Service cannot issue permits to collect these species for any purpose. This authority is granted only to the US. Fish and Wildlife Service.	N		
Plant Collecting (Including Sensitive Species): The Forest Supervisor may issue permits to collect sensitive or restricted plants or plant pans for legitimate scientific or educational purposes. Such collection must not jeopardize the continued vigor or existence of a plant population. Sensitive or restricted plants shall not be collected for commercial or personal use.	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Plant Collecting (Including Sensitive Species): Collecting plants or plant parts for any commercial purpose requires a commercial use permit issued by the Ranger District where the collecting activity is proposed. District rangers shall issue or deny commercial permits after review of a proposal presented by the collecting party. When evaluating applications for commercial collecting permits, consideration shall be given to the impacts on all Forest resources, including plant and animal diversity.	N		
Plant Collecting (Including Sensitive Species): Botanical collection permits may be issued by the Forest Supervisor to authorize collection of species other than endangered, threatened, sensitive, or restricted species.	N		
Plant Collecting (Including Sensitive Species): The above standards and guidelines regarding plant collection do not apply to the harvest of trees for timber and firewood.	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Lands			
National Forest System and non-Federal lands inside and adjacent to the Winema National Forest boundary shall be classified into one of the five landownership planning groups listed below. The Forest may develop more specific adjustment plans by area or with specific ownerships as a supplement to the Forest Plan. Group 1 - Congressional Direction This group includes those lands in which Congress has directly or indirectly instructed the Forest Service to retain in ownership and to acquire non-Federal lands for a designated purpose, such as wilderness or wild and scenic rivers. Acquisition of less than fee (full) title would be considered if direction and land management objectives could be met. Group 2 - Special Management Areas This group includes those lands that the Forest Service has recognized the need for a special kind of management through the land and resource management planning process. Examples include special interest, roadless recreation, and research natural areas. The landownership direction is to retain National Forest System ownership and to acquire non-Federal land as the opportunity and/or need arises. Acquisition of less than fee title would be considered if land management objectives could be met. Group 3 - General Forest This group includes lands that are characteristically general forestland or general rangeland where management direction emphasizes commodity production. These lands will be available for land adjustment and will usually provide most of the land considered in exchange projects. The basis for group 3 is the assumption that lands in this group will be managed to provide similar types of outputs, whether in private or public ownership. Landownership direction is to acquire and to dispose of lands as necessary to facilitate exchanges. Group 4 - Isolated National Forest Tracts and Intensively Developed Non-Federal Land Land in this group consists of (1) small isolated tracts of National Forest land situated away from contiguous blocks of National Forest land; and (2) non-Federal lands that are managed for intensive uses such as agriculture, residential subdivision, industrial development, ditch lines, and State and county highways. Landownership direction for this group characteristically is to make National Forest land available for acquisition of non-Federal lands in groups 1, 2, or 3. Non-Federal lands in this group will generally not be acquired. Group 5 - Lands Needing Further Study This group includes situations where more intensive study and planning are necessary before landownership decisions can be made. The primary factor that determines the need for intensive study is the necessity for close coordination with local and State governments. Intensive study generally involves private expansion around National Forest ownership Examples are: residential community growth, industrial development, or conversion of timberlands and rangelands to a more intense type of agriculture.	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Land Line Location: Property boundary surveys, posting, and marking shall be accomplished to support planned or ongoing resource projects (such as timber harvest) to solve or to prevent trespass and to identify administrative and private land boundaries. Adjacent landowners should be encouraged to share the costs of surveying common boundaries.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 POD Att. U POD Att. 21
Land Line Location: Land surveying shall be accomplished in accordance with existing objectives, priorities, and standards.	P	P, B	EIS Sec. 2.4.2.1 POD Att. U POD Att. 21
Land Line Location: To protect the values of congressionally designated areas like wilderness, national parks, and wild and scenic rivers, boundaries shall be located before project implementation.	N		
Rights-of-Way: Appropriate rights-of-way shall be acquired for all roads and trails necessary for the operation and administration of the Forest.	N		
Rights-of-Way: In areas where national forest intermixes with large areas of private land or other land under a single ownership, the Forest Service should enter into a Road Rights-of-way Construction and Use Agreement for cost-sharing any joint road system. (This should be done when It is feasible and advantageous to the United States.) Roads within agreement areas shall be added to the agreement by supplement before commercial use commences.	N		
Special Uses: Special use management provides for the use and occupancy of National Forest land when such use is consistent with Forest management area goals and objectives. This use should be permitted only by law, when such uses are in the public interest, and when such uses cannot be served by reasonable development on private land. Special use applications shall be evaluated through environmental analysis before the permit is issued, and appropriate site-specific requirements and mitigation measures shall be developed and included in the permit.	P, R	P, B, ,	EIS Sec. 1.4 EIS Secs. 1.5 EIS Secs. 2.1.4 - 2.1.6 EIS Sec. 3.4.3 EIS Sec. 4.7.3.3 - 4.7.3.6 EIS App. F.2 EIS App. F.3 EIS App. F.4 POD Att. DD
Special Uses: Private landowners shall be granted reasonable access across National Forest System land, subject to applicable regulations and policies. Where reasonable access alternatives across other ownerships exist, authorization to cross National Forest land will not be granted.	N		
Special Uses: Existing withdrawals shall be reviewed by 1991 to determine whether, and for how long, the continuation of the existing withdrawals would be consistent with the statutory objectives of the programs for which the lands were dedicated.	N		
Special Uses: All special-use permits shall be revised when renewed to reflect Forest Plan direction.	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Special Uses: All recreation special uses shall be compatible with the Recreation Opportunity Spectrum classification of the area. Facilities shall be designed to meet the designated services to be provided. The number of permits for a specific use should be limited in order to create or to maintain economical operations, to reduce administrative costs, and to provide high quality services. Prospective permittees must demonstrate that they have the financial resources to undertake the proposed venture, or the permit shall not be issued.	N		
Special Uses: All special uses shall be inspected to ensure compliance with the permit.	P, C, R, O	P, B	EIS Sec. 2.1.6 EIS Sec. 2.6.2
Special Uses: In project planning and execution, care should be taken to prevent damage to permitted uses, such as summer homes, water developments, and private utilities.	P	P, B, R	EIS Sec. 2.4.2.2 POD Att. I
Special Uses: The facilities located within existing transportation and utility corridors shall be managed by the agency that acquired the rights-of-way, in accordance with the requirements of the easement, special-use permit, or authorization.	P, C, O	P, B	EIS Sec. 2.1.6
Special Uses: Additional transportation and utility corridors that major utilities may need shall be designated through an interagency environmental analysis following procedures in the Regional Guide. Future corridor planning and subsequent environmental analysis shall be in accordance with management area goals and objectives. These areas have management goals or environmental constraints that are not, or may not be, compatible with certain types of utility or transportation facilities.	N		
Special Uses: To avoid the proliferation of rights-of-way, the use of existing corridors shall be considered first in determining the best location for a new utility proposal. New transportation and utility proposals shall be accommodated within existing corridors to the maximum extent feasible.	P	P, R	EIS Sec. 1.4 EIS Sec. 1.5 EIS Secs.2.1.6 EIS Sec. 2.3.2.3 EIS Sec. 3.4.3
Special Uses: Existing sites used for electromagnetic communications shall be protected from interferences generated by power transmission lines This may require the power transmission lines to be rerouted or redesigned to protect those sites, or it may otherwise require the proponent of the power line to equitably mitigate the uses established for those sites.	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Special Uses: The following actions should be taken in connection with electronic sites: 1. Develop site plans for existing sites which have facilities in place. 2. Identify potential sites for future development during environmental analyses. 3. Develop site plans for new sites prior to development. 4. Issue new permits to direct use of the sites in the following order: a. Utilize residual capacity of existing sites; b. Utilize identified potential sites; and c. Utilize other sites deemed suitable through environmental analysis after preparation of a site plan	N		
Special Uses: Utilities should be designed and located so that they are not highly visible from sensitive transportation corridors or other sensitive viewer locations.	P, R	P, R, ,	EIS Sec. 2.1.4 EIS Sec. 4.7.3.4 EIS Sec. 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 EIS App. F.8 EIS App. K POD Att. 1 POD Att. DD
Special Uses: Utility lines shall be buried when it is technically and economically feasible.	P, C	P, B	EIS Sec. 2.4.2.1 POD Att. I
Minerals and Energy			
Not Applicable, Excluded From Table			
Native American Rights and Claims			
The Forest is committed to fulfilling its obligations as an agency of the United States under the Klamath Treaty of 1864. Since management of the forest may affect the resources on which the tribe depends for exercise of its treaty rights, the Forest will determine through the NEPA process whether each land and/or resource management decision may affect resources subject to the tribe's treaty rights. The Forest, through the NEPA process, will analyze, disclose, and consider potential effects on the tribe.	P	P, R	EIS Sec. 1.4 EIS Sec. 1.5 EIS Sec. 4.11.1.2 EIS Sec. 4.11.3.3 EIS Secs. 4.11.4 & 4.11.5 POD Att. Z
All management activity on former reservation lands shall meet applicable requirements of the Klamath Treaty of 1864, the Act of August 13, 1954, as amended (Termination of Federal Supervision of the Klamath Tribe), the Restoration Act, and the terms of the Consent Decree of 1981. Appendix D[21] contains the major portions of the treaty and consent decree.	P, C, O	P, B, R	EIS Sec. 1.4 EIS Sec. 1.5 EIS Sec. 4.11.1.2 EIS Sec. 4.11.2.2 EIS Sec. 4.11.5 POD Att. Z
The Forest will inform and invite participation from the Klamath Tribe in planning of resource management activities. This will include holding an annual coordination meeting with the tribe to discuss anticipated projects. This meeting will be used to identify interest in specific projects.	P, C, O	P	EIS Sec. 1.5 EIS Sec. 4.11.1.2 POD Att. Z

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[21] Appendix D: Klamath Indian Treaty and Consent Decree, Winema Land and Resource Management Plan

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
The American Indian Religious Freedom Act shall be complied with on all Forest land.	P, C, O	P	EIS Sec. 1.5 EIS Sec. 4.11.1.2 EIS Sec. 4.11.4 POD Att. Z
Protection			
Fire Management: All wildfires shall receive an appropriate suppression response. The response shall be safe, timely, and cost efficient and shall meet management objectives for the area, including objectives for plant and animal diversity.	N		
Fire Management: Using the lowest cost suppression option, aggressive suppression action shall be applied to control and extinguish wildfires that threaten life, private properly, public safety, improvements, or investments.	N		
Fire Management: An escaped fire situation analysis shall be prepared for any wildfire that escapes initial attack and/or threatens to exceed established parameters, or is no longer consistent with fire management direction.	N		
Fire Management: Retardant drops shall be carefully controlled in proximity to open bodies of water (lakes and streams) to preclude retardant from entering lakes or live streams.	N		
Fire Management: Utility companies shall be notified of any fire situation originating on or threatening their permitted use area to ensure the safety of firefighters and to allow utilities to be prepared to temporarily suspend use if needed.	N		
Fire Management: Prescribed fire may be used in natural fuels: to reduce fire hazard; to enhance diversity in the structure and composition of plant communities: to enhance the production and protection of commercial timber yields: and to enhance other resource outputs such as wildlife habitat, forage, and browse. Prescribed fire may include both planned and unplanned ignitions.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Sec. 4.4.2.3 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 POD Att. I POD Att. R
Fire Management: Prescribed fire in wilderness (see 'Protection,' Management Area 6 - Wilderness).	N		
Fire Management: Proposed activity units (harvest, thinning, conversion, and release, for example) should be designed and coordinated on the ground. This is done to consider size, shape, location, timing, spatial distribution, and management risk for fire management and other resource requirements and to help make the fuel treatment and fire protection of the units as practical and economical as possible.	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Fire Management: Fuel treatments shall conform with all Federal and State standards and regulations for air quality.	P, C, O	P, B	EIS Sec. 1.5 EIS Sec. 2.4.2.1 EIS Sec. 2.7.2 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 POD Att. B POD Att. I POD Att. K POD Att. R
Fire Management: Prescribed fire prescriptions shall be consistent with management area objectives.	P	P, B	EIS Secs. 4.4.1.3 & 4.4.2.3 EIS Sec. 4.8.1.3 EIS Sec. 4.12.1.3 POD Att. B POD Att. R
Integrated Pest Management: All planned activities shall include integrated pest management practices. All insect and disease control projects shall be carried out in ways that meet management area objectives	P, C, R, O	P, B	EIS Sec. 2.7.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS Secs. 4.7.3.5 & 4.7.3.6 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. N
Integrated Pest Management: Silvicultural methods and cultural treatments should be applied to reduce susceptibility to hazards of insects and disease. If normal insect surveillance indicates the threat of an epidemic, project-level detection and control operations, including coordination with other landownerships, shall be accomplished on a forestwide basis.	P, C, R, O	P, B	EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Secs. 4.4.2.2 & 4.4.2.3 POD Att. N
Integrated Pest Management: The Forest Plan incorporates the Pacific Northwest Region's FEIS for Managing Competing and Unwanted Vegetation. In implementing the Forest Plan through project activities, the Forest will comply with the Record of Decision issued by the Regional Forester dated December 8, 1988, and the Mediated Agreement of August 1989. Use of all vegetation management techniques is allowed only when other methods are ineffective, or will unreasonably increase project costs Emphasis must be on prevention and early treatment of unwanted vegetation and on full public involvement in all aspects of project planning and implementation. Information about the vegetation management FEIS, ROD, and Mediated Agreement is available at the Forest Supervisor's Office.	N		
Noxious Weed Control: Treatment priorities and strategies shall be in accordance with the Oregon State Comprehensive Classification List: 'A' Classification (isolated distribution) - eradicate existing populations; 'B' Classification (general distribution) - intensively control or eradicate; and 'C' Classification (general distribution) - control or (It feasible) eradicate.	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Noxious Weed Control: Under any funding level, funds available for weed control activities shall be distributed in the following order: 1. Cooperation with the Oregon State Department of Agriculture; 2. Treatment of Forest infestations through internal funding; and 3. Treatment of waived private lands within Forest boundaries through internal funding.	N		
Noxious Weed Control: In project planning, all available methods of control (for example, manual, mechanical, biological, chemical, cultural, fire, and regulatory methods) shall be fully considered.	P	P, B	EIS Sec. 2.7.3 EIS Secs. 4.7.3.5 & 4.7.3.6 EIS Secs. 4.4.1.2 & 4.4.1.3 EIS Secs. 4.5.1.2 & 4.5.1.3 EIS App. F.2 EIS App. F.4 POD Att. N
Law Enforcement: Aggressive, appropriate actions will be taken to enforce Federal laws, rules, and regulations as set forth in Titles 16, 18, and 21 of the U.S. Federal Code as they pertain to lands managed by the US. Forest Service. These actions will be accomplished by professional law enforcement persons within the Forest Service.	N		
Law Enforcement: Priorities for law enforcement will be: 1. Protection of employees and the public from harassment, bodily injury, and/or death while using the national forest or working on the national forest; 2. Timber theft in the form of sawlogs and firewood; 3. Drug manufacturing and the related violence and contamination; and 4. Cultural resource theft and vandalism and the related losses.	N		
Law Enforcement: The goals of the Forest Law Enforcement Program are: (1) to ensure compliance with Federal laws and regulations pertaining to the national forests; (2) to provide for the protection of the Forest's property and resources: (3) to provide for the safety of Forest visitors and their property in a cooperative effort with local law enforcement agencies; and (4) to provide for the safety of Forest Service employees. These goals will be accomplished by: 1. Prevention - Preventing violations through voluntary compliance by Forest users is the main objective of the program. This can normally be accomplished by means of education. 2. Cooperation - Cooperative Law Enforcement is authorized by Public Law 92-82. Under this law, the Forest Service will reimburse the cooperator for those extraordinary expenditures incurred by providing additional services requested by the Forest Service for recreational users. 3. Enforcement - Line officers are responsible to assure that effective action is taken against persons violating Federal laws and regulations on the Forest.	N		
Range – Not Applicable, Excluded From Table			

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Recreation			
The Forest shall coordinate with adjacent forests and other recreation providers (public and private) to provide a full range of recreation settings and opportunities.	N		
An interpretative plan shall be developed for each district to coordinate efforts to provide interpretation of natural and cultural features and management activities and to provide outdoor education. Interpretative facilities, techniques, and materials selected shall be compatible with the assigned Recreation Opportunity Spectrum (ROS) classes and development levels.	N		
The public shall be informed of recreation opportunities and conditions on a continual basis using a variety of media.	N		
Construction and reconstruction projects shall be planned and implemented as outlined in the Region 6 (R-6) Recreation, Facilities, and Trails Development Process.	N		
Only facility designs that are approved for use in R-6 and that are compatible with the ROS class and designed development level shall be installed. All recreation signs shall be in accordance with applicable Regional standards.	N		
New facilities shall be designed to be barrier-free to the extent feasible. Selected existing facilities shall be modified to remove barriers.	N		
The project feasibility report shall include estimates of existing and potential demand for the type, design, and location of proposed recreation facilities. Demand estimates should be based on market surveys, customer surveys, or user group requests.	N		
New or reconstructed sno-parks should be designed in accordance with the Oregon Department of Transportation 'Guidelines and Criteria for Designating Sno-parks.' Designs and snow-plowing needs should be coordinated with local State or county highway maintenance departments.	N		
Areas that are important to Forest visitors include undeveloped campsites; places with scenic, geologic, or biological values; and other areas that receive significant dispersed recreation use. These special places shall be identified and evaluated for significance during project planning. These areas shall be considered for protection and/or enhancement in project design.	N		
The Forest shall emphasize educating dispersed area users to the principles of minimum-impact use of the Forest, such as the 'Pack it Out,' 'Without a Trace,' and Tread Lightly' programs.	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Off-road vehicle (ORV) use shall be managed to: minimize resource damage; promote user safety; minimize conflicts with others; and, be compatible with management area objectives. Where ORV use is causing resource or facility damage, use may be restricted or prohibited. An ORV implementation schedule shall be developed with user groups to designate ORV travelways and to list restricted and closed areas.	P, C, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.6.2 EIS Sec. 2.7.3 EIS Secs. 4.2.2.1 & 4.2.2.5 EIS Sec. 4.2.3 EIS Sec. 4.4.1.3 EIS Secs. 4.5.1.3 & 4.5.2.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Sec. 4.8.2.3 EIS Secs. 4.10.2.5 & 4.10.2.6 POD Att. I POD Att. S POD Att. Y
Trails shall be planned, designed, constructed, and maintained as recreation facilities that complement the objectives of the management areas being served, in accordance with documented trail management objectives.	N		
The Forest trail system shall be designed to provide users with a wide range of ROS and WRS settings and difficulty levels. The system shall provide for a wide variety of user types, including both summer and winter users.	N		
A trail management plan shall be developed for each district. These plans shall include a trail inventory, trail management objectives for each trail, and a prioritized listing of construction and reconstruction needs.	N		
Trails and related facilities shall be protected with appropriate mitigation measures during management activities. Measures that may be used to mitigate effects of activities include vegetative screening, temporary or permanent rerouting, temporary closure, interpretative signing, and modification of treatments along the trail corridor.	N		
Trail and road locations shall be planned to minimize conflicts. New road crossings of existing trails should be avoided.	??		
Displacement of system trails by new roads or other management activities should be avoided. Where displacement occurs, trails shall be relocated to maintain the integrity of the system and to ensure the quality of the recreation experience.	N		
An automated recreation information system (RGRIM) shall be maintained. This includes an inventory of facilities and a record of estimated use by site or area.	N		
Scenic Resources			
A higher visual quality objective than that stated in the management area may be met when consistent with management area objectives.	N		
Treatment of catastrophic occurrences, such as insect or disease outbreaks or major wildfires, may suggest a deviation from scenic management direction. This will be documented through the environmental analysis process before implementation.	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Landscape architects should assist with the planning and design of those projects that have the potential to affect the scenic resources, especially considering cumulative effects.	P, R	P, R, M,	EIS Sec. 2.1.4 EIS Sec. 3.4.1.32 EIS Sec. 4.7.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 EIS Secs. 4.14.2.8 & 4.14.3 EIS App. F.8 EIS App. K POD Att. A POD Att. DD
All management activities, as practicable, shall be shaped and blended to fit the natural landscape character as viewed from background distances.	N		
Inventories of visual quality shall be maintained or updated; existing visual condition and desired condition, as a minimum, shall be mapped. Use and demand for scenic quality will be reflected in mapping.	N		
Evidence of management activities throughout project implementation, such as signing, tagging, tree marking, and staking, should be located to minimize negative effects on scenery and recreation settings. These should be removed following completion of projects.	P, C, R, O	P, B	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.8.1.3 & 4.8.2.3 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. A POD Att. I POD Att. U POD Att. T POD Att. BB
During project environmental analyses, identified existing conditions that do not meet scenic management direction shall be considered for rehabilitation.	P, R	P, M,	EIS Sec. 2.1.4 EIS Sec. 4.7.3.4 EIS Secs. 4.8.1.3 & 4.8.2.3 EIS App. F.8 EIS App. K POD Att. A POD Att. DD
For project planning, the 'National Forest Landscape Management Series' handbooks may be used for technical guidance.	N		
The State Highway 140 viewshed Implementation Guide shall be used for guidance in project planning within that viewshed.	N		
Soil and Water			
The Forest shall cooperate with local Soil and Water Conservation Districts and other agencies to improve soil, water, and riparian resources.	N		
Cooperative snow courses, buffers, and improvements shall be protected as required by current agreement with the Soil Conservation Service. Existing sites include Billie Creek, Chemult, Cold Springs, Fourmile Lake, Sevenmile Marsh, and Taylor Butte.	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Land management activities shall be planned and conducted to maintain or to improve soil productivity and stability.	P, C, R, O	P, B, M, A	EIS Sec. 2.1.3.5 EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.2.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Sec. 4.7.3.4 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. U POD Att. BB POD Att. DD LRMP Amendments WNF-4 & WNF-5
Forest management activities shall meet or exceed the stated objectives in the Organic Act of 1897, the Multiple Use Sustained Yield Act of 1960, and the National Forest Management Act of 1976. Floodplains and wetlands on the Forest shall be managed according to Executive Order 11 988 (Floodplain Management) and Executive Order 11 990 (Protection of Wetlands).	P, C, R, O	P, B, R, M,	EIS Secs. 1.4 EIS Secs. 1.5 EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 – 2.4.2.3 EIS Sec. 4.7.3.4 EIS App. F.4 POD Att. I POD Att. BB POD Att. DD
The current Soil Resource Inventory shall be revised and updated as needed to meet management needs.	N		
Detrimental Soil Conditions: The cumulative effects of detrimental soil conditions should not exceed 20 percent of the total acreage within the activity area: any reason for exceeding the limitation shall be documented in an environmental assessment. Detrimental soil conditions include compaction, displacement, puddling, and moderately or severely burned soil from all activities (including roads, skid trails, and landings). Sites where the standards for displacement, puddling, and compaction are not currently met will require rehabilitation such as ripping, backblading, or fertilization. The potential for creating detrimental soil conditions will be specifically addressed through project environmental analyses. If needed, alternative management practices will be developed, and mitigating measures will be planned and implemented.	P, C, R, O	P, B, A	EIS Sec. 1.5 EIS Secs. 2.1.3.5 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Secs. 4.7.3.4 EIS Sec. 4.14.2.3 EIS Secs. 4.14.3.1 & 4.14.3.4 POD Att. I EIS App. F.2 EIS App. F.4 LRMP Amendments WNF-4 & WNF-5

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Detrimental Soil Conditions: Detrimental conditions occur when one or more of the following criteria are exceeded. 1. Compaction: Detrimental compaction is that beyond the following limits--(a) on volcanic ash/pumice soils, an increase in soil bulk density of 20 percent or more over the undisturbed level; (b) on other soils, an increase in soil bulk density of 15 percent or more over the undisturbed level, a macropore space reduction of 50 percent or more, and/or a reduction below the 15 percent level as measured by an air permeameter. 2. Puddling: Soil puddling is a physical change in soil properties due to shearing forces that destroy soil structure and reduce porosity. 3. Displacement: Detrimental displacement is the removal of more than 50 percent of the topsoil- or humus-enriched AI or AC horizons from an area of 100 square feet or more which is at least 5 feet in width. 4. Severely burned soil: Leave a minimum of 90 percent of a project area unaffected by severely burned conditions, Soils are considered to be severely burned when the top layer of mineral soil is significantly changed in color, usually to a reddish color, and the next 0 5 inch is blackened from organic matter charred by heat conducted through the top layer.	P, C, R, O	P, B, A	EIS Sec. 1.5 EIS Secs. 2.1.3.5 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Sec. 4.7.3.4 EIS App. F.2 EIS App. F.4 LRMP Amendments WNF-4 & WNF-5
Soil Erosion: To stay within acceptable levels of soil loss and meet soil management objectives, the minimum percent effective ground cover after any soil disturbing activity should be as follows in Table 4-18[22]. Exceptions to these standards may be made after completing the environmental assessment process with input from a soil specialist.	P, R	P, B	EIS Secs. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 POD Att. I
Soil Erosion: Tractor logging should generally not be prescribed when slopes exceed 35 percent.	N		
Organic Residues: Management activities should be planned to retain small woody (dead and down) material to sustain soil nutrients and a healthy forest ecosystem. As a goal, 10 tons or more per acre of 9-inch diameter or smaller woody material should be maintained where practicable.	P	P, B	EIS Sec. 2.4.2.1 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Sec. 4.4.2.3 POD Att. I POD Att. U
Riparian Ecosystems (Streams, Stream-Side Areas, Floodplains, and Wetlands): For those projects that could adversely affect riparian ecosystems, water quality, or stream structure and function, specific objectives for the management of riparian areas shall be developed during project environmental analysis. These objectives will be based on: stream classification, site-specific topographic and vegetative characteristics, water quality standards and goals, and other resource objectives (as appropriate).	P	P, A	EIS Sec. 2.1.3.5 EIS Sec. 2.4.2.2 EIS Sec. 4.3.4.1 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. BB LRMP Amendments WNF-1 & WNF-5.

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[22] Table 4-18: Minimum Percent Effective Ground Cover, Winema Land and Resource Management Plan

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Riparian Ecosystems (Streams, Stream-Side Areas, Floodplains, and Wetlands): In riparian ecosystems, hydrologic conditions and riparian habitat shall be maintained or improved.	P, C, R, O	P, B, M,	EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. BB POD Att. DD
Riparian Ecosystems (Streams, Stream-Side Areas, Floodplains, and Wetlands): No management practices shall be permitted within riparian areas that cause detrimental changes in water temperature or chemical composition, blockages of water courses, or deposits of sediment which seriously and adversely affect water conditions or fish habitat.	P	P, B,	EIS Sec. 2.4.2.2 EIS Sec. 4.3.4.1 EIS Secs. 4.7.3.4 & 4.7.3.5 EIS App. F.4 POD Att. I POD Att. BB
Riparian Ecosystems – Vegetation Management: Sufficient amounts of ground cover should be maintained within a riparian area to prevent erosion and the direct movement of potential pollutants into a stream. Refer to table 4-18[23].	P, C, R, O	P, B	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.4.1.3 POD Att. I POD Att. BB
Riparian Ecosystems – Vegetation Management: Riparian areas should be managed to maintain stream banks in a stable condition along at least 85 percent of a stream's length in any given drainage.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. BB POD Att. DD
Riparian Ecosystems – Vegetation Management: In stream-side areas for Class I, II, and III streams, present and future sources of large woody material should be provided. Existing instream material should be maintained or enhanced. Specific quantitative criteria should be developed on a stream-by-stream basis.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.5.2.4 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. P POD Att. U POD Att. BB POD Att. DD

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[23] Table 4-18: Minimum Percent Effective Ground Cover, Winema Land and Resource Management Plan

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Riparian Ecosystems – Vegetation Management: Vegetation should be managed to provide adequate shading in areas along streams to meet State of Oregon temperature standards. Shade may be provided by overhanging grasses, shrubs, trees, and topography.	P, C, R, O	P, B, M	EIS Sec. 1.5 EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Sec. 4.1.3.5 EIS Secs. 4.4.4.1 & 4.4.4.3 EIS Sec. 4.6.2.4 EIS App. F.2 EIS App. F.4 POD Att. BB POD Att. DD
Riparian Ecosystems – Vegetation Management: Riparian areas should be managed to maintain or achieve a range forage condition class of good.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.4.1.3 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. BB POD Att. DD
Riparian Ecosystems – Vegetation Management: Riparian areas should be managed to maintain or improve the habitat of fish and aquatic and terrestrial wildlife. Vegetation and natural debris should be maintained and managed to: (1) maintain or enhance stream channel and bank structure so as to maintain or enhance water quality and (2) provide structural fish habitat to support natural populations of fish in Class I and II streams.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.4.1.3 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. BB POD Att. DD
Riparian Ecosystems: Management activities shall meet the aquatic resource protection standards of Oregon's Removal-Fill Law (ORs 541.695) unless otherwise exempted.	P, C, R	P, B	EIS Sec. 1.5 EIS Sec. 2.4.2.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.7.3.5 EIS App. F.4 POD Att. CC
Riparian Ecosystems: New water developments and reconstruction of existing developments shall be coordinated through the environmental analysis process. Water developments may need to be fenced to protect riparian vegetation and wildlife habitat from damage by livestock or other resource activities.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Secs. 4.5.2.3 & 4.5.2.4 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. BB POD Att. DD

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Stream-Side Areas and Floodplains: Activities that could have short-term adverse effects on floodplain values may occur only if specific mitigation measures designed to minimize the effects are implemented and documented in project planning records. Natural floodplain characteristics shall be restored shortly after the activity has stopped. Floodplain values include those characteristics of a floodplain that facilitate the safe passage of flood flows with minimal damage on-site or downstream. Vegetation, topography, and other features that contribute to the safe dissipation and release of peak flows and maintenance of base flows should be maintained or improved.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Secs. 4.5.2.3 & 4.5.2.4 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. BB POD Att. DD
Stream-Side Areas and Floodplains: Intensity of harvest treatments and spatial distribution of cutting units shall ensure that hydrologic conditions are maintained or improved.	N		
Water Quality (Best Management Practices): The Forest shall comply with State requirements in accordance with the Clean Water Act for protecting waters of the State of Oregon through planning, applying, and monitoring Best Management Practices (BMPs) in conformance with the Clean Water Act, regulations, and Federal guidance.	P, C, R, O	P, B	EIS Sec. 1.5 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.3.2.2 & 4.3.3.2 EIS Secs. 4.3.4.1 & 4.3.4.3 POD Att. I POD Att. M POD Att. CC
Water Quality (Best Management Practices): In cooperation with the State of Oregon, the Forest shall use the following process: 1. Select and design BMPs based on site-specific conditions; technical, economic, and institutional feasibility; and the water quality standards for those waters potentially impacted. 2. Implement and enforce BMPs. 3. Monitor to ensure that practices are correctly applied as designed. 4. Monitor to determine the effectiveness of practices in meeting design expectations and in attaining water quality standards. 5. Evaluate monitoring results and mitigate where necessary to minimize impacts from activities where BMPs do not perform as expected 6. Adjust BMP design standards and application when it is found that beneficial uses (including domestic, recreation, irrigation, industrial, and fish and wildlife habitat uses) are not being protected and water quality standards are not being achieved to the desired level or if it is found that BMPs are more restrictive than necessary. Evaluate the appropriateness of water quality criteria for reasonably assuring protection of beneficial uses. Consider recommending adjustment of water quality standards.	P, C, R, O	P, B	EIS Sec. 1.5 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.7.2 EIS Secs. 4.3.2.2 & 4.3.3.2 EIS Secs. 4.3.4.1 & 4.3.4.3 POD Att. I POD Att. M POD Att. CC

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Water Quality (Best Management Practices): Use the existing arranged process to implement the State Water Quality Management Plan on lands administered by the Forest Service as described in Memoranda of Understanding (MOU) between the Oregon Department of Environmental Quality and U.S. Department of Agriculture, Forest Service (February 12, 1979, and December 7, 1982), and 'Attachments A and B' referred to in this MOU ('Implementation Plan for Water Quality Planning on National Forest Lands in the Pacific Northwest' (December 1978) and 'Best Management Practices for Range and Grazing Activities on Federal Lands,' respectively).	P, C, R, O	P, B	EIS Sec. 1.5 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 2.7.2 EIS Secs. 4.3.2.2 & 4.3.3.2 EIS Secs. 4.3.4.1 & 4.3.4.3 POD Att. I POD Att. M POD Att. BB
Water Quality (Best Management Practices): Individual, general Best Management Practices are described in 'General Water Quality Best Management Practices,' Pacific Northwest Region, November 1988. Site specific BMPs are developed at the project level.	P	P, B	EIS Secs. 2.4.2.1 & 2.4.2.2 POD Att. I POD Att. M POD Att. X POD Att. BB
Water Quality (Best Management Practices): BMPs relating to protection of water quality shall be followed for any chemical application projects. In the event of an accidental spill of hazardous materials, procedures shall be followed as set forth in the Oil and Hazardous Substances Pollution Contingency Plan.	P, C, R, O	P, B	EIS Sec. 1.5 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.3.2.2 & 4.3.3.2 POD Att. I POD Att. N POD Att. X POD Att. BB
Water Quality (Best Management Practices): Management activities in and around Class I and II streams shall not cause a measurable water temperature increase when the existing stream temperatures are 58 degrees F or greater, or cause more than a 2 degrees F increase due to cumulative effects when the existing stream temperatures are 56 degrees F or less.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.3.2.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.5.2.4 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. BB POD Att. DD
Water Quality (Best Management Practices): No more than 10 percent increase over natural stream turbidities should occur. Temporary changes to the above standard may occur, but must be transitory in nature. Changes as a result of management activities must be minimal and adequately monitored.	P, C	P, B	EIS Sec. 2.4.2.2 EIS Sec. 2.6.2 EIS Sec. 4.3.2.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Secs. 4.5.2.3 & 4.5.2.4 POD Att. I POD Att. M POD Att. BB

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Water Quality (Best Management Practices): Management activities in and around Class III and IV streams will not contribute to the deterioration of water quality for downstream Class I and II streams. However, these activities are allowed, provided the standards for Class I and II streams continue to be met.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Sec. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.3.2.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.5.2.4 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. BB POD Att. DD
Water Quality (Best Management Practices): Management activities, particularly timing of road building and timber harvest, shall be scheduled to minimize long-term detrimental changes in watershed conditions. Spatial distribution and timing of activities will be the principle factors used to avoid unacceptable cumulative impacts.	P, C, O	P, B	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.7.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS Sec. 4.14.2.4 EIS App. F.4 POD Att. I POD Att. U POD Att. Y POD Att. BB
Water Quality (Best Management Practices): Areas in which water quality is being adversely affected shall be given high priority for treatment to minimize the effects and eliminate the cause.	P, C, R, O	P, M	EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.3.2.2 & 4.3.3.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.5.2.4 EIS Secs. 4.7.3.5 & 4.7.3.6 EIS App. F.2 EIS App. F.4 POD Att. 9 POD Att. BB POD Att. DD
Water Quality (Best Management Practices): Effluents shall be disposed of in a manner which will prevent the contamination of surface or subsurface water. Sewage treatment and disposal facilities shall be approved by the Oregon Department of Environmental Quality or Its contract agents and shall be in compliance with the rules of the Environmental Quality Commission.	P, C, R, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 2.6.2 POD Att. I POD Att. M POD Att. W3

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Instream Flow: Wetland, floodplain, riparian, and watershed characteristics shall be maintained to provide for storage and routing of ground and surface water, including floodwaters.	P, C, R, O	P, B, M	EIS Sec. 2.1.4 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.3.2.2 & 4.3.3.2 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.5.2.4 EIS Secs. 4.7.3.5 & 4.7.3.6 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. BB POD Att. DD
Instream Flow: The Forest shall follow national and regional policy when obtaining water rights, protecting existing water rights, and protecting instream flows.	N		
Instream Flow: The Forest shall conform with any minimum stream flow established by law.	N		
Cumulative Effects: A cumulative effects assessment shall be made in watersheds where project scoping identifies an issue or concern regarding the cumulative effects of activities on water quality or stream structure and function. This will include land in all ownerships in the watershed. Activities on National Forest System lands in these watersheds should be dispersed in time and space to the extent practicable and at least to the extent necessary to meet management requirements. On intermingled ownerships, scheduling efforts shall be coordinated to the extent practicable.	P	P	EIS Secs. 4.7.3.5 & 4.7.3.6 EIS Secs. 4.14 .2.4 & 4.14.3.4 EIS App. F.2 EIS App. F.4
Coordinate Federal Water Claim: The Forest will coordinate the development, timing, and content of its water rights claim in the Klamath Basin Adjudication with those of the Klamath Tribe and other Federal agencies (including U S Fish and Wildlife Service, National Parks Service, and US. Bureau of Reclamation).	N		
Timber: Programmed timber harvest activities shall occur only on lands classified as suited for timber production However, harvest activities may occur on other lands for the following purposes: 1. Removal of timber from road locations. 2. Construction or protection of capital improvements like campgrounds, buildings, fuelbreaks, and dispersed recreation sites; or projects designed to enhance other resource values. 3. Removal of hazards to human life and health. 4. Removal of timber killed by catastrophic events, such as fife, windthrow, drought, insects or disease (36 CFR 219.27[c][1]). The decision to salvage harvest an area shall be based on an analysis of existing conditions following the disturbance. 5. Where small inclusions in harvest units that otherwise are suitable will allow use of more logical management units and road locations resulting in less resource impacts. 6. As part of a research study to test the feasibility of silvicultural and harvesting practices that could be successful on these lands.	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: During project-level planning, the inventory of suitable lands shall be corrected as needed using the following process: 1. Boundary adjustments to refine mapping lines shall be documented in the project planning records and maintained in the Ranger District resource inventory system. 2. Where changes in classification are needed, the analysis and rationale for the needed change shall be documented by the Ranger District and sent to the Forest Supervisor for inclusion in the Forest planning process records. These changes shall be reviewed by the Forest Supervisor for consistency, and amendments will be made to the Forest Plan as needed.	N		
Timber: The selection of the appropriate harvest cutting method shall be guided by the criteria provided in the Regional Guide on page 3-2.	N		
Timber: A silvicultural prescription shall be written for all stands scheduled for silvicultural treatment. A prescription will describe the proposed treatment following an analysis of present stand conditions, physical site factors, management direction, and silvicultural objectives. Information needed to evaluate stand conditions and to develop and verify silvicultural prescriptions should be gathered from a stand examination or other type of adequate data collection survey.	N		
Timber: Logging systems shall be compatible with silvicultural systems and resource protection objectives. Timber sales requiring special logging systems shall be planned by a person trained in logging systems.	P	P, B	EIS Sec. 2.4.2.1 POD Att. I POD Att. U
Timber: Tractor logging generally should not be prescribed when slopes exceed 35 percent.	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Forest openings created by the application of even-aged silviculture shall not exceed 40 acres. The openings should be shaped or blended with the natural terrain to achieve scenic, plant and animal diversity, and wildlife habitat objectives to the extent practicable. Exceptions are permitted for catastrophic events (such as windstorms, or insect and disease attacks) or on an individual basis after a 60-day public notice period and review by the Regional Forester. In addition, the 40-acre limit may be exceeded by as much as 50 percent without necessitating review by the Regional Forester or a 60-day public notice when exceeding the lima will produce a more desirable combination of net public benefits and when any one of the following criteria is met: 1. When a larger created opening will enable the use of an economically feasible logging system that will lessen the disturbance to soil, water, wildlife, fish, riparian resources, or residual vegetation. 2. When created openings meeting this size limit cannot completely encompass groups of trees infected with dwarf mistletoe or root disease and, therefore, need to be expanded to include these trees in order to avoid infection of adjacent susceptible timber. 3. Where visual quality objectives require shaping and blending of openings to fit the landform. 4. When larger openings are needed to achieve regeneration objectives in harvest areas being cut by the shelterwood method and when destruction of the newly created stand of reproduction would occur as a result of delayed removal of shelter trees. This exception applies only to existing sheltewood units and shelterwood units under contract before approval of the Forest Plan. Newly planned shelterwood units should not exceed the opening size limitations.	N		
Timber: Created openings shall be separated by areas generally not classed as created openings. The areas between created openings shall contain one or more logical harvest units. These areas shall be large enough and contain a stand structure to meet resource requirements. Resource requirements may include needs for wildlife habitat, watershed, scenic management, and other resources.	N		
Timber: Created openings adjacent to 30-acre or larger natural openings should be limited to an area not exceeding one-third the size of the natural opening and not occupying more than one-third of the natural opening perimeter. Openings created adjacent to any natural openings should be designed to protect wildlife values and visual quality levels.	N		
Timber: A harvest area shall no longer be considered a created opening for silvicultural purposes when stocking surveys carried out in accordance with Regional instructions indicate prescribed crop tree stocking at or above 4.5 feet in height and free to grow. Where other resource management considerations are limiting, such as wildlife habitat and scenic requirements, a created opening shall no longer be considered an opening when the vegetation in it meets the management area prescription objectives.	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Acreage of continuous stand management activity in any one decade for uneven-aged management treatments, intermediate treatments for even-aged stands, overwood removal treatments, and precommercial thinning shall be determined through the interdisciplinary process considering wildlife, scenic, and other resource standards and guidelines for the management area.	N		
Timber: Lands should be reforested within five years of final harvest, except where permanent openings are created for wildlife habitat improvement, vistas, recreation uses, and similar practices Five years after final harvest means five years after clearcutting, five years after final overstory removal, five years after seed tree removal in seed tree harvesting, or five years after selection harvesting where stocking is reduced below minimum levels.	N		
Timber: A regeneration prescription shall contain the minimum number, size distribution, and species composition of planned regeneration. The prescription shall plan to prevent unwanted vegetation and animal damage to the seedlings. The prescription shall plan for monitoring the plantation, and aggressive action shall be taken to eliminate unwanted vegetative competition, animal damage, and any other threat that would prevent meeting the reforestation objective.	N		
Timber: Natural regeneration opportunities should be prescribed where experience indicates natural regeneration will be successful meeting the standards of 13-11 above.	N		
Timber: With a goal of satisfactory stocking within three years, site preparation units should be planted within one year of scarification, except where such units have been prepared for natural regeneration.	N		
Timber: Regional or local stocking guides shall be used to assess stocking adequacy on all regeneration units prior to certifying them as satisfactorily reforested	N		
Timber: Where stocking levels are lower than optimum but above minimums, interplanting should be done when it is a manageable and economically feasible method to meet growth requirements.	N		
Timber: Stocking level control shall be based on Regional or local site-specific stocking guides.	N		
Timber: Stocking level control should be maintained on all acres with a programmed harvest.	N		
Timber: Existing stands of seedlings and saplings less than 5 inches DBH may be precommercially thinned. Existing stands of poles that exceed 5 inches DBH should be planned for commercial thinning.	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	**Applicable**	**Consistency**	**Comment**
Timber: Clearcuts may be prescribed when. 1. Regenerating shade-intolerant species and planning to reforest by natural regeneration or planting; 2. Regenerating shade-intermediate tolerance species and planning to reforest by planting; 3. Regenerating shade-intolerant species in heavily diseased or insect infested stands; or 4. Openings created in the forest do not conflict with wildlife, scenic, or other management objectives.	N		
Timber: Seed tree harvests may be prescribed when: 1. Regenerating shade-intolerant species; 2. Regenerating shade-intolerant species and planning to supplement planted stock with natural seeding of another species; 3. Regenerating shade-intolerant species where anticipated mortality will be high and supplementing planted stock to ensure adequate stocking is achieved; 4. Regenerating in areas physically unsuited for plantings such as rocky areas or areas with high potential for animal damage (also see 13-13); or 5. Openings created in the forest do not conflict with wildlife, scenic, or other management objectives.	N		
Timber: Shelterwood harvests may be prescribed when: 1. Sites need amelioration (for example, reduction in temperature extremes) for establishment of desired species. 2. Sites need to be modified to reduce the potential for animal damage or vegetative competition. 3. Scenic, wildlife, or other management objectives can best be met by delaying removal of all trees in an area.	N		
Timber: Final removal of shelter trees should occur as rapidly as possible, providing the following criteria are met: 1. Reproduction no longer requires protection of overstory shelter trees. 2. Reproduction has gone through a minimum of two growing seasons, is healthy, and meets or exceeds minimum stocking levels. 3. Removal of overstory shelter trees meets other resource objectives.	N		
Timber: Uneven-aged management shall be the preferred silvicultural system on climax ponderosa pine stands and on healthy pine associated stands.	N		
Climax Ponderosa Pine Stands And Healthy Pine Associated Stands: Even-aged stands of ponderosa pine and pine associated stands should be treated to develop uneven-aged stand structures whenever possible.	N		
Climax Ponderosa Pine Stands And Healthy Pine Associated Stands: Uneven-aged pine associated stands should be planted as needed to maintain at least 50 percent ponderosa pine species composition.	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Climax Ponderosa Pine Stands And Healthy Pine Associated Stands: Uneven-aged management should be used where stands are free of dwarf mistletoe and root rots. Where stands are lightly infected, uneven-aged management shall be employed only where the dwarf mistletoe and root rot can be managed to maintain stand growth within 80 percent of its disease-free potential. Disease centers should be managed using even-aged silvicultural practices at a large enough scale to prevent reinfection from the perimeter. In stands with small scattered disease centers, group selection may be an appropriate silvicultural practice as long as the disease centers are effectively treated to prevent spread. A recordkeeping system will be developed to record the location and past treatment of known disease centers to schedule future treatments to control and to prevent the spread of the disease.	N		
Climax Ponderosa Pine Stands And Healthy Pine Associated Stands: Silvicultural prescriptions should be designed to maintain or to improve the existing size class diversity and uneven-aged structure.	N		
Climax Ponderosa Pine Stands And Healthy Pine Associated Stands: Group selection may be used to: treat diseased stands, convert even-aged stands to uneven-aged stand structures, and maintain or develop early successional species such as ponderosa pine in the pine associated and mixed conifer stands. Group selections shall be 0.25 acre to 2 acres in size.	N		
Climax Ponderosa Pine Stands And Healthy Pine Associated Stands: Timber harvest should not occur before the stand density equals 45 percent of the maximum stand density index or 60 percent maximum basal area.	N		
Climax Ponderosa Pine Stands And Healthy Pine Associated Stands: Individual tree selection shall not reduce stocking levels below 25 percent of the maximum stand density index or 45 percent maximum basal area.	N		
Climax Ponderosa Pine Stands And Healthy Pine Associated Stands: Timber harvest and post-sale activities should generally be planned on a 30-year entry cycle for individual tree selection and on a 20-year cycle for group selection. All post sale activities should be completed within five years following the harvest entry.	N		
Climax Ponderosa Pine Stands And Healthy Pine Associated Stands: Stands should not be salvage logged at other than the prescribed entry cycle; the exception is where wildfire, bark beetles, disease, or other conditions have created catastrophic mortality.	N		
Climax Ponderosa Pine Stands And Healthy Pine Associated Stands: Timber marking guidelines should be developed which retain the most vigorous trees of best quality. First priority for leave trees are those with demonstrated good vigor. Second priority is those trees which will produce high value products in the future.	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Climax Ponderosa Pine Stands And Healthy Pine Associated Stands: Following each commercial harvest entry, post-sale activities should emphasize natural regeneration and stocking level control. Where natural regeneration is a planned objective, post-sale activities should be closely coordinated to produce disturbance to the litter and vegetation as necessary for natural regeneration to occur.	N		
Climax Ponderosa Pine Stands And Healthy Pine Associated Stands: Selection harvest units should be planted as needed to maintain stocking levels and to maintain disease-free healthy stands.	N		
Timber harvest, fuels treatment, and site preparation activities should strive not to damage residual crop trees.	N		
Stands receiving overstory removal treatments should meet or exceed minimum crop tree stocking following completion of harvest and post-sale activities.	N		
Prescriptions for regeneration harvest should feature maintenance of existing reproduction that has crop tree potential.	N		
Minimum utilization standards to be used in timber harvest operations for all commercial species shall be: (1) 9 inch DBH to a 6 inch top for regeneration harvest, (2) 7 inch DBH to a 5 inch top for commercial thinning and selection harvest, and (3) 7 inch DBH to a 4 inch top for all lodgepole pine harvest.	N		
Where individual market areas or specific products present opportunities for utilizing a higher proportion of the tree, these standards could be exceeded. In some cases, other resource objectives may require leaving a higher proportion of woody material on site. These utilization standards do not apply to materials left to meet fish, wildlife, and soil management objectives.	N		
Miscellaneous forest products such as poles, boughs, Christmas trees, and house logs should be made available to the level compatible with meeting management area objectives.	N		
Management Area 1 -Semiprimitive Recreation			
Not Applicable, Excluded From Table			
Management Area 1A – Yamsay Mountain Semiprimitive Recreation Area			
Not Applicable, Excluded From Table			
Management Area 1 B – Brown Mountain Semiprimitive Recreation Area – Not Applicable, Excluded From Table			
Not Applicable, Excluded From Table			
Management Area 1 C – Pelican Butte Semiprimitive Recreation Area			
Not Applicable, Excluded From Table			

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Management Area 2 - Developed Recreation			
Recreation: Areas shall generally be managed to provide roaded natural or rural Recreation Opportunity Spectrum (ROS) settings	N		
Recreation: Motorized vehicles shall be restricted to designated routes and areas. Some trails or areas may be designated for nonmotorized activities only, such as hiking, biking, or cross-county skiing.	N		
Recreation: A site plan for any recreation development shall be prepared before construction. The plan shall be prepared or reviewed by a journey-level landscape architect and approved by the Forest Supervisor. 'As built' site plans for existing sites shall be prepared or updated to show current and proposed facilities.	N		
Recreation: Developed recreation sites shall be designed, administered, and maintained to provide a quality experience for the visitor, to provide for public health and safety, to protect the site resources and facilities, and to minimize operation and maintenance costs (FSM 2330).	N		
Recreation: Existing sites should be upgraded and/or expanded to accommodate user needs before new sites are constructed. Compatible facilities and sites should be concentrated in recreation complexes to provide a variety of opportunities in one area and to minimize operating costs.	N		
Recreation: New or additional facilities to add capacity shall be planned when the average weekend use exceeds 90 percent of the designed persons-at-one-time (PAOT) of the site or when use for the managed peak use season exceeds 90 percent of the Practical Maximum Capacity.	N		
Scenic: Management activities in the environment surrounding recreation sites shall achieve the retention visual quality level, except in lodgepole pine salvage areas.	N P, C, R, O	P, B, ,	EIS Sec. 2.1.4 EIS Sec. 4.7.3.4 EIS Sec. 4.8.1.3 EIS Secs. 4.8.2.2 & 4.8.2.3 EIS App. F.8 EIS App. K POD Att. B POD Att. DD
Timber: Timber harvest shall not be programmed.	N		
Timber: Timber management activities shall be utilized to maintain overall, healthy stand conditions and to maintain or to enhance recreational values in accordance with an approved vegetation management plan. Such activities within existing sites normally shall occur during non-use or low-use periods	N		
Timber: Hazardous trees or limbs will be removed before opening sites to public use.	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Water, Soil, and Air: Comply with State requirements in accordance with the Clean Water Act for protection of waters of the State of Oregon, including the antidegradation policy for high quality waters, through implementation of General Water Quality Best Management Practices.	N		
Water, Soil, and Air: In areas with concentrated recreation use, the percent of area impacted by detrimental soil conditions (compaction) may exceed forestwide standards. Facilities should be designed and arranged to concentrate and to direct traffic flow to reduce impacts. Site-hardening measures used should be appropriate for the designed development level.	N		
Minerals and Energy: Salable mineral material sources should not be developed.	N		
Minerals and Energy: Dead and down logs for firewood may be gathered within a recreation area or site for use in that area.	N		
Lands: Landownership classification group 2 applies to this management area.	N		
Lands: This management area is an avoidance area for new transportation and utility corridors.	N		
Facilities: With full consideration to public safety, roads and trails shall be constructed and maintained to standards that are consistent with recreation opportunities and the level of service needed.	N P, C, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 4.8.1.3 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. I POD Att. S POD Att. Y
Facilities: New facilities shall be designed to blend with the natural setting and to visually complement existing structures.	N		
Protection: All wildfires shall be aggressively suppressed by using low-impact methods as much as practical. During high fire danger periods, rapid attack may be appropriate, using all available tactics to ensure public safety and to protect improvements.	N		
Protection: Fuel treatment methods that minimize adverse effects like removal and chipping shall be used within developments. Treatment normally would occur during non-use or low-use periods.	N		
Management Area 2A – Developed Recreation, Low Level Development			
Not Applicable, Excluded From Table			
Management Area 2B – Developed Recreation, Moderate Level Development			
Not Applicable, Excluded From Table			
Management Area 2C – Developed Recreation, High Level Development			
Not Applicable, Excluded From Table			

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Management Area 2D – Developed Recreation, Special-Use Permit Areas			
Not Applicable, Excluded From Table			
Management Area 3 - Scenic Management			
Recreation: The area shall be managed to provide a semiprimitive or roaded natural recreation opportunity setting.	N		
Recreation: Recreation facilities may be placed in this management area, provided they are designed to achieve the visual quality objectives.	N		
Recreation: Viewshed guides shall be prepared to provide project-level direction for Forest Plan implementation. These guides shall provide guidance regarding the following elements: large trees, distinctive bark, spring and fall color, variety of tree species, shrubs and ground covers, emphasis on special landscape features, vista creation, rotation of view openings, and rehabilitation needs.	N		
Recreation: Because of existing negative visual elements like skid roads, activity residues, or cable corridors, landscapes or portions of landscapes not meeting visual quality objectives should be rehabilitated with consideration for the resource values present.	N		
Recreation: Enhancement of selected areas or views may be conducted through vegetative manipulation, landform alteration, or inclusion of structural elements when needed to achieve objectives of the management area.	N		
Range: Structural and nonstructural range improvements shall be constructed of native materials or designed to blend with the landscape.	N		
Timber: Timber harvest shall be programmed.	N		
Timber: A mix of naturally occurring species should be maintained in regenerated harvest units in pine associated and mixed conifer working groups with emphasis on ponderosa pine, Douglas-fir, and sugar pine.	N		
Timber: Aspen, ponderosa pine, and white fir should be emphasized where they occur in predominantly lodgepole stands. Presence of ponderosa pine in ecotones should be maintained.	N		
Timber: Screening vegetation should be perpetuated for areas such as rock quarries, road cut and fill slopes, utility ways, structures, or unhealed harvest areas.	P, C, R, O	P, B,	EIS Sec. 4.7.3.4 EIS Secs. 4.8.1 2 & 4.8.1.3 EIS Secs. 4.8.2.2 - 4.8.2.4 EIS Sec. 4.12.2.5 POD Att. B
Timber: Created openings shall be shaped to appear natural in the landscape.	N		
Timber: Size of timber harvest units should be in scale with the surrounding landscape character, considering distance from viewer and dispersion needs to achieve desired variety.	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Clumps or islands of vegetation/leave trees within natural-shaped clearcut units may be retained to reduce contrast of visual elements.	N		
Timber: Individual tree selection, group selection, or combinations of both shall be used to achieve the desired future condition in ponderosa pine and pine associated species.	N		
Timber: In ponderosa pine and pine associated species where uneven-aged management is applied, from 30 percent to 35 percent of an area shall be considered for treatment at any one time, and treatments shall be dispersed over the total area. All lands should be entered, as needed, on a 20- to 30-year cutting cycle.	N		
Timber: Management of armillana root rot in mixed conifer and mountain pine beetle in lodgepole pine should focus on long-term diversity and visual quality achievement. Consideration should be given to short-term mitigation such as design of harvest units (which includes maintenance of vegetated clumps). Some natural mortality also should be accepted until stand conversion can be implemented over time.	N		
Minerals and Energy: New salable mineral material sources should not be developed.	N		
Minerals and Energy: Existing mineral material sources should not be expanded into scenic areas.	N		
Minerals and Energy: Existing mineral material sources shall be analyzed for short-term mitigations to achieve scenic objectives and long-term rehabilitation measures. Partial rehabilitation of a material source should be considered when that part no longer is of use for development.	N		
Minerals and Energy: Reasonable access for the exploration and/or development of locatable and leasable minerals shall be allowed but shall be highly controlled to protect scenic values.	N		
Minerals and Energy: Except for road access, surface occupancy should not be allowed.	N		
Lands: Landownership classification group 3 applies to this management area. Disposal of lands should occur only if lands of equal or higher scenic quality shall be acquired.	N		
Lands: Special-use permits shall be permitted for structures that existed before designation of lands to scenic emphasis. Rehabilitation should be emphasized for any structures that do not blend with the landscape.	N		
Lands: New special uses may be permitted when they are consistent with the management objectives and are justified through an environmental analysis.	P	P, B,	EIS Secs. 2.1.6 EIS Sec. 4.7.3.4 EIS Secs. 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. A

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Lands: This management area is an avoidance area for new transportation and utility corridors.	P	P, R, A	EIS Sec. 2.1.3.5 EIS Sec. 4.7.3.4 EIS Secs. 4.8.1.2 & 4.8.1.3 EIs Secs. 4.8.2.3 & 4.8.2.4 POD Att. A EIS App.F.2 LRMP Amendment WNF-1
Facilities: Roads, parking lots, and other necessary facilities shall be designed to flow with the typical lines and slopes in the landscape and/or shall be screened by natural vegetation	P, R	P, B, R	EIS Secs. 2.3.2.2 & 2.3.2.3 EIS Sec. 2.4.2.3 EIS Sec. 4.8.1.3 EIS Secs. 4.8.2.3 & 4.8.2.4 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. A POD Att. Y
Facilities: Closed roads should appear natural with large logs and boulders partially buried to blend with the area and should be tilled and revegetated with trees, shrubs and grasses, as appropriate to the location.	N		
Management Area 3A – Scenic Management, Foreground Retention			
Scenic: Evidence of management activities from projects that produce slash (tree harvest) or charred bark (underburning) will not be noticeable one year after the work has been completed.	C, R, O	B, A	EIS Sec. 2.1.3.5 EIS Sec. 2.4.2.1 EIS Sec. 4.7.3.4 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. A POD Att. I POD Att. R POD Att. U EIS App. F.2 EIS App. F.8 LRMP Amendment WNF 2
Timber: Large tree character will be perpetually retained in the foreground retention area in all species, except lodgepole pine, through maintaining three to five large diameter trees (between 30 inches and 36 inches DBH) on the average per acre. These should be distributed in groupings for greatest visual effect. Some areas may have high numbers of large diameter trees, and other areas may have fewer small clumps. Openings may or may not have mature large-diameter trees, if not, more trees will be retained on other acres to maintain the three-to-five-trees-per-acre average in the foreground overall.	N		EIS Sec. 2.3.2.1 EIS Sec. 4.4.1.2 EIS Secs. 4.7.3.5 & 4.7.3.6 EIS Secs. 4.8.2.3 & 4.8.2.4 EIS App. F.2 EIS App. F.4 POD Att. P POD Att. U

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: In ponderosa pine and pine associated areas where uneven-aged management will prevail, the objective is to achieve a healthy, multi-aged forest with timber stands that contain a variety of tree sizes up to 36 inches DBH following harvest. At least three canopy levels or size classes are present within each stand.	N		
Timber: For even-aged and group selection management, the long-term objective is to achieve the mix of tree size classes shown in Table 4-22[24].	N		
Timber: Stumps, If visible, shall be cut to approximately 6 inches or less in height on the uphill side of the stump.	C, O	B	EIS Sec. 2.4.2.1 POD Att. A POD Att. I POD Att. U
Timber: Thinning units should be irregularly marked (vary the density of leave trees) in the immediate foreground to break up the viewing distance and to provide diversity.	N		
Timber: Landings, decks, major skid roads, temporary roads, and slash piles shall be located to utilize vegetative or landform screening opportunities. These should be located away from critical line-of-sight viewing areas.	P	P, R	EIS Sec. 2.4.2.1 EIS Secs. 4.8.1.3 & 4.8.2.3 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. A POD Att. I POD Att. U POD Att. Y
Protection: Fire suppression efforts in the immediate foreground should use low-impact methods. If heavy equipment is needed on high-intensity fires, rehabilitation may be needed to mitigate the effect on the visual resource.	P, C, O	P, B	EIS Sec. 2.4.2.1 EIS Sec. 4.8.2.3 POD Att. I POD Att. K
Protection: Harvest residues resulting from management activities should not be evident after residues treatment.	C, R, O	B	EIS Sec. 2.4.2.1 EIS Sec. 4.8.2.3 POD Att. A POD Att. I POD Att. U

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[24] Table 4-22: Scenic Foreground Retention Tree Size Class Objectives: Even-Aged and Group Selection Management Strategies, Winema Land and Resource Management Plan

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Management Area 3B – Scenic Management, Foreground Partial Retention			
Scenic: Evidence of management activities from projects that produce slash (tree harvest) or charred bark (underburning) should not be noticeable from two to three years after the work has been completed.	C, R, O	B, A	EIS Sec. 2.1.3.5 EIS Sec. 2.4.2.1 EIS Sec. 4.7.3.4 EIS Secs. 4.8.2.3 & 4.8.2.4 POD Att. A POD Att. I POD Att. R POD Att. EIS App. F.2 EIS App. F.8 LRMP Amendment WNF-3
Timber: Large tree character will be retained in the foreground area in all species, except lodgepole pine, through maintaining three to five large diameter trees (between 24 inches and 30 inches DBH) on the average per acre. These should be distributed in groupings for greatest visual effect. Some areas may have high numbers of large diameter trees, and other areas may have fewer small clumps. Openings may or may not have mature large diameter trees; if not, more trees will be retained on other acres to maintain the three-to-five trees-per-acre average in the foreground overall.	N		EIS Sec. 2.3.2.1 EIS Sec. 4.4.1.2 EIS Secs. 4.7.3.5 & 4.7.3.6 EIS Secs. 4.8.2.3 & 4.8.2.4 EIS App. F.2 EIS App. F.4 POD Att. I POD Att. P POD Att. U
Timber: In ponderosa pine and pine associated areas where uneven-aged management will prevail, the objective is to achieve a healthy, multi-aged forest with timber stands that contain a variety of size classes up to 30 inches DBH following harvest. At least three canopy levels or size classes are present within each stand.	N		
Timber: For even-aged and group selection management, the long-term objective is to achieve the mix of tree size classes shown in Table 4-24[25].	N		
Timber: Stumps, if visible, shall be cut to approximately 6 inches or less in height on the uphill side of the tree.	C, O	B	EIS Sec. 2.4.2.1 POD Att. A POD Att. I POD Att. U
Timber: Thinning units should be irregularly marked (vary the density of leave trees) in the immediate foreground to break up the viewing distance and to provide diversity.	N		

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[25] Table 4-24: Scenic Foreground Partial Retention Tree Size Class Objectives: Even-Aged and Group Selection Management Strategies, Winema Land and Resource Management Plan

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Landings, decks, major skid roads, temporary roads, and slash piles should be located to the rear of the stands to use vegetative or landform screening opportunities. These should be located away from critical line-of-sight viewing areas.	P	P, R	EIS Sec. 2.4.2.1 EIS Secs. 4.8.2.3 EIS Secs. 4.10.2.1 & 4.10.2.6 POD Att. A POD Att. I POD Att. U POD Att. Y
Protection: Harvest residues resulting from stand management activities may be evident but should blend, where possible, with the surrounding landscape characteristics.	C, R, O	B	EIS Sec. 2.4.2.1 EIS Sec. 4.8.2.3 POD Att. A POD Att. I POD Att. U
Protection: Hand tools are the preferred method for fire suppression in the immediate foreground. Mitigation or rehabilitation measures may be necessary for high-intensity fires.	P, C, R, O	B	EIS Sec. 2.4.2.1 EIS Sec. 4.8.2.3 POD Att. I POD Att. K
Management Area 3C – Scenic Management, Middleground Partial Retention – Not Applicable, Excluded From Table			
Not Applicable, Excluded From Table			
Management Area 4 - Unique Management Areas			
Not Applicable, Excluded From Table			
Management Intensity 4A – The Pinnacles and Devils Garden Geologic Areas			
Not Applicable, Excluded From Table			
Management Intensity 4B - Mare’s Egg Spring Botanical Area			
Not Applicable, Excluded From Table			
Management Intensity 4C – Williamson River Gorge Scenic Area			
Not Applicable, Excluded From Table			
Management Area 5 - Sycan National Wild and Scenic River			
Not Applicable, Excluded From Table			
Management Area 6 – Wilderness			
Not Applicable, Excluded From Table			
Management Area 6A – Mount Thielsen Wilderness			
Not Applicable, Excluded From Table			
Management Area 6B – Sky Lakes Wilderness			
Not Applicable, Excluded From Table			

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Management Area 6C – Mountain Lakes Wilderness			
Not Applicable, Excluded From Table			
Management Area 7 – Old-Growth Ecosystems			
Not Applicable, Excluded From Table			
Management Area 8 - Riparian Areas			
Recreation: The area shall be managed for a full range of recreation opportunity settings.	N		
Recreation: Primary recreation emphasis shall be placed in dispersed recreation.	N		
Recreation: The visual quality level shall be consistent with adjacent area objectives, and typically will be partial retention or better as a result of other riparian area standards and guidelines.	N		
Recreation: Recreation facilities placed in riparian areas shall be designed to protect riparian values.	N		
Wildlife and Fish: Dead woody material and cavity-nester habitat shall be provided by managing dead trees at the 80 percent potential population level for cavity nesters (Thomas 1979) in forested areas Green trees shall be managed for future replacements for dead trees.	N		
Wildlife and Fish: New roads within 0.25 mile of a riparian area shall be located in a manner as to provide for greatest topographic and vegetative screening of the riparian area.	P	P, R	Secs. 2.3.2.1 & 2.3.2.3 EIS Sec. 4.7.3.5 EIS Sec. 4.8.2.3 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.4 POD Att. A POD Att. Y
Wildlife and Fish: Wildlife habitat improvements may be permitted.	P, R	P,	EIS Sec. 2.1.4 EIS Sec. 4.5.1.3 EIS Secs. 4.7.3.5 & 4.7.3.6 EIS App. F.2 EIS App. F.3 EIS App. F.4 POD Att. DD
Range: Where a combination of high soil moisture and fine soil texture results in stream banks susceptible to early season trampling damage, grazing shall be delayed to a late season period (Claly and Webster 1989).	N		
Range: Where stream banks or channels are highly erodible, the stubble height at the end of the grazing period shall exceed 4 inches. Under extreme conditions, the area may need permanent protection or removal of grazing for long periods (Claly and Webster 1989).	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Range: Water developments for livestock or wildlife in riparian areas shall be designed to protect riparian values.	N		
Range: Salting areas shall be located on uplands outside of riparian areas.	N		
Range: Sheep bedding areas shall be located on uplands outside of riparian areas.	N		
Soil and Water: Riparian area management objectives shall be described for a specific zone along a stream or wetland within the proposed project area. As a minimum, the following areas shall be evaluated during the preparation of the objectives: 1. an area within 100 feet of the normal high water line of Class I, II, or 111 streams (for protection of water quality and wildlife habitat); 2. an area within 25 feet on each side of Class IV streams; 3. any timbered area within 200 feet of wet meadows (to provide wildlife hiding cover); 4. the entire area of a wetland, including the farthest reaches of the riparian vegetative influence; and 5. any seeps and springs	P	P	EIS Secs. 4.3.1.2, 4.3.2.2 & 4.3.3.2 EIS Secs. 4.5.1.3 & 4.5.2.4 EIS Sec. 4.7.3.5 EIS App. F.4
Soil and Water: The cumulative total area of detrimental soil conditions in riparian areas shall not exceed 10 percent of the total riparian acreage within an activity area. Detrimental soil conditions include compaction, displacement, puddling, and moderately or severely burned soil.	P, C, R, O	P, B, A	EIS Sec. 1.5 EIS Sec. 2.1.3.5 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Secs. 4.2.3.1 & 4.2.3.2 EIS Sec. 4.7.3.4 EIS Sec. 4.14.2.3 EIS Secs. 4.14.3.1 & 4.14.3.4 POD Att. I EIS App. F.2 EIS App. F.4 LRMP Amendment WNF-5
Soil and Water: Fish habitat and riparian area improvement projects shall be permitted.	P, R	P,	EIS Sec. 2.1.4 EIS Secs. 4.3.4.1 & 4.3.4.3 EIS Sec. 4.5.2.4 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. DD
Timber: Timber harvest shall not be programmed within 100 feet of Class I and II streams and within 50 feet of Class III streams. In other riparian areas, timber harvest shall be programmed.	N		
Timber: Stocking level control may be delayed If necessary to provide big game cover or habitat diversity.	N		
Timber: Directional fell and yard away from all stream channels (classes I-IV) and wet areas. Logs yarded over streams shall be fully suspended where practicable.	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Timber: Landings should not be located within riparian associations as defined by 'Riparian Zone Associations' (R6 Ecol TP-279-87, Kovalchik).	N		
Timber: Uneven-aged management in the ponderosa pine, pine associated, and mixed conifer working groups shall be designed to maintain healthy, multistoried stands that contain various size classes up to 36 inches DEH following harvest. The lodgepole pine working group shall receive a variety of silvicultural treatments to meet the management area objectives.	N		
Timber: Existing stands of hardwood species should be protected or enhanced.	N		
Minerals and Energy: New salable mineral material sources should not be developed, and existing developments should not be expanded into riparian areas.	N		
Minerals and Energy: Reasonable access for the exploration and/or development of locatable and leasable minerals shall be allowed but shall be highly controlled to protect riparian values.	N		
Minerals and Energy: Except for road access, surface occupancy should not be allowed.	N		
Lands: Landownership classification group III applies to this management area. Disposal of lands shall occur only if riparian lands of equal or higher quality shall be acquired.	N		
Facilities: New road construction in riparian areas should be avoided. Where road construction is unavoidable, roads should cross riparian areas perpendicular to the landform. System and temporary roads should not be constructed through the length of a riparian area System and temporary roads crossing a riparian area shall not alter stream or ground water flow characteristics to a degree that will adversely affect the riparian characteristics.	P, C, R, O	P, B, R	EIS Secs. 2.3.2.1 & 2.3.2.3 EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.7.3.5 EIS Secs. 4.10.2.1 & 4.10.2.6 EIS App. F.4 POD Att. I POD Att. Y POD Att. BB
Facilities: Existing roads within riparian areas should be evaluated for opportunities to reduce impacts on riparian values.	P, R	P,	EIS Sec. 2.1.4 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. DD
Facilities: New water developments and reconstruction of developments for road dust abatement and fire control, for example, in riparian areas shall be designed to protect riparian values.	P	P	EIS Secs. 2.4.2.1 & 2.4.2.2 EIS Sec. 4.7.3.5 EIS Sec. 4.10.2.6 EIS App. F.4 POD Att. A POD Att. I POD Att. BB
Protection: Wildfire suppression methods that minimize effects on the soil and on riparian ecosystems shall be used. High-impact methods shall be used only on fires that threaten human life and property and riparian resources.	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Management Area 8A – Riparian Areas Adjacent to Class I, II, and III Streams			
Recreation: Vehicles, including off-road vehicles, shall not be allowed in stream channels or on sensitive stream banks.	N		
Wildlife and Fish: Water use during low water periods shall be limited to emergency fire suppression situations only.	P, C, O	P, B	EIS Sec. 2.4.2.2 POD Att. B POD Att. M
Wildlife and Fish: Fish habitat improvements may be permitted but must be coordinated with range, watershed, and recreation resources, and the Oregon Department of Fish and Wildlife.	P, R	P,	EIS Sec.1.5 EIS Sec. 2.1.4 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. DD
Wildlife and Fish: Shrubs and trees shall be managed to maintain at least 50 percent of the riparian area in hiding cover for big game.	N		
Wildlife and Fish: Wildlife improvements encouraging streamside cover may be permitted.	P, R	P,	EIS Sec. 2.1.4 EIS Sec. 4.7.3.5 EIS App. F.2 EIS App. F.4 POD Att. DD
Wildlife and Fish: Reservoirs may be planned for fisheries and other compatible uses where feasible.	N		
Range: Livestock shall be managed so that no more than 5 percent of the stream banks in a stream reach (see glossary) exhibit degradation caused or perpetuated by livestock.	N		
Timber: All logging slash/residue shall be removed from within the high water level. Large logs may be left or introduced as large woody debris.	N		
Timber: Created openings, which may be necessary to treat lodgepole pine, shall not occur directly across a stream from an existing opening. Openings shall not encompass more than 600 feet of a stream length.	N		
Timber: Selected hardwoods or conifer trees adjacent to the stream channel shall be retained.	N		
Facilities: To provide for fish passage, arch culverts, bridges, or similar open bottom structures should be required on permanent road crossings on all Class I and II perennial streams.	N		
Protection: Heavy equipment generally shall not be allowed in stream channels. Based on resource analysis, exceptions such as dry crossings or fords may be allowed upon approval of appropriate line officer or designated resource adviser.	N		
Protection: Fuels shall be disposed of so that they will not reach stream courses. Slash piles shall not be located within the normal high-water flow area of either natural or created drainages.	N		

TABLE 2.3-1

Winema National Forest Land and Resource Management Plan

Element	Applicable	Consistency	Comment
Protection: Only low intensity fire should be prescribed within 100 feet horizontal distance on either side of Class I, 11, or III stream channels.	N		
Management Area 8B – Riparian Areas Adjacent to Class IV Streams			
Not Applicable, Excluded From Table			
Management Area 8C – Moist and Wet Meadows			
Not Applicable, Excluded From Table			
Management Area 8D - Moist and Wet Forested Riparian Areas (Hardwood, Lodgepole, or Other Conifer)			
Not Applicable, Excluded From Table			
Management Area 9 – Bald Eagle Habitat			
Not Applicable, Excluded From Table			
Management Area 9A – Bald Eagle Nest Sites and Recovery Sites			
Not Applicable, Excluded From Table			
Management Area 9B – Bald Eagle Replacement Habitat			
Not Applicable, Excluded From Table			
Management Area 9C – Bald Eagle Winter Roosting Habitat			
Not Applicable, Excluded From Table			
Management Area 10 – Big Game Winter Range			
Not Applicable, Excluded From Table			
Management Area 12 - Timber Production			
Not Applicable, Excluded From Table			
Management Area 13 - Research Natural Areas			
Not Applicable, Excluded From Table			
Management Area 14 - Minimum Management			
Not Applicable, Excluded From Table			
Management Area 15 - Upper Williamson			

3.0 AMENDMENT OF THE UMPQUA, ROGUE RIVER AND WINEMA LAND AND RESOURCE MANAGEMENT PLANS BY THE RECORD OF DECISION FOR AMENDMENTS TO FOREST SERVICE AND BUREAU OF LAND MANAGEMENT PLANNING DOCUMENTS WITHIN THE RANGE OF THE NORTHERN SPOTTED OWL (NORTHWEST FOREST PLAN).

In April 1994, the management plans of the BLM and Forest Service administrative units within the range of the northern spotted owl were amended by the Northwest Forest Plan (NWFP) to provide additional protections to for species dependent on late-successional and old-growth (LSOG) forests.[26] The NWFP provided new standards and guidelines for management of habitat for late-successional and old-growth related species. Existing management direction not related to LSOG forests such as visual management objectives remained unchanged, as did management direction that provided additional or more restrictive protections for LSOG habitat dependent species. Table 3.0-1 tracks key elements of the NFWP that apply to the Pacific Connector project.

TABLE 3.0-1

Key Elements of the Umpqua, Rogue River and Winema National Forest LRMPs as amended by the Northwest Forest Plan Applicable to the Pacific Connector Project

Element	Applicable	Consistency	Comment
Aquatic Conservation Strategy and applicable implementing standards and guidelines (NWFP B-9).	P, C, R, O	P, B, R	Actions must not prevent attainment of ACS objectives. Standard and Guideline LH4 (NWFP C-37) is the guiding standard rights of way that cross Riparian Reserves. Rights of way are permitted so long as they do not retard or prevent attainment of the ACS objectives (see EIS section 4.7.3.5). See also Appendix F.4 Aquatic Conservation Strategy Assessment.
Late Successional Reserves (LSR) and applicable implementing standards and guidelines (NWFP C-9).	P, C, R, O	P, B, R, A	New developments in LSRs are permitted provided effects can be minimized and mitigated (NWFP C-17). Amendment UNF-4 on the Umpqua NF and RRNF -7 on the Rogue River NF are proposed to reallocate matrix lands to the LSR land allocation to offset impacts to LSRs by the pipeline corridor (see EIS section 4.7.3.6). See also Appendix F.3, Late Successional Reserve Assessment.

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[26] Originally the NWFP covered federal lands managed by the Bureau of Land Management (BLM) and Forest Service within the range of the NSO. However, in August 2016, the BLM issued new Resource Management Plans that replaced the management direction for BLM lands in Oregon. Therefore, the management direction in the NWFP no longer applies to Oregon BLM lands.

TABLE 3.0-1

Key Elements of the Umpqua, Rogue River and Winema National Forest LRMPs as amended by the Northwest Forest Plan Applicable to the Pacific Connector Project

Element	Applicable	Consistency	Comment
Survey and Manage Species and applicable implementing standards and guidelines (NWFP C-4). See also the Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (2001) which amended the management direction for Survey and Manage species in the forest plans of the Umpqua, Rogue River and Winema National Forests.	P, C, R, O	P, B, R, A	Known sites of Survey and Manage species cannot be avoided because of the linear nature of the project. Amendment FS-1 of the Umpqua, Rogue River and Winema National Forests is proposed to waive the Management Recommendations to protect known sites so long as persistence of affected Survey and Manage species is not threatened by the project (see EIS section 4.6.4.3).. See also Appendix F.5, Survey and Manage Species Assessment.

APPENDIX F.2

Forest Service Proposed Amendments and CMP

Jordan Cove Natural Gas Liquefaction and
Pacific Connector Gas Pipeline Project
Final EIS

Appendix F.2

Forest Service Proposed Amendments and CMP

Pacific Connector Gas Pipeline

Prepared for:
USDI Bureau of Land Management

Prepared by:

Stantec Consulting Services Inc.

November 2019

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1.0 INTRODUCTION

1.1 LAND AND RESOURCE MANAGEMENT PLAN AMENDMENTS

The Umpqua, Rogue River, and Winema National Forest are managed under a Land and Resource Management Plan (LRMP) or (Forest Plan) required by the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the National Forest Management Act of 1976 (NFMA) and incorporated into the agency planning regulations (36 CFR 219, [2012 version]). A land management plan provides a framework for integrated resource management and for guiding project and activity decision-making on a national forest, grassland, prairie, or other administrative unit. Consistent with the Multiple-Use Sustained-Yield Act of 1960 (MUSYA), the Forest Service manages National Forest System (NFS) lands to sustain the multiple use of its renewable resources in perpetuity while maintaining the long-term health and productivity of the land. Resources are managed through a combination of approaches and concepts for the benefit of human communities and natural resources. Land management plans guide sustainable, integrated resource management of the resources within the plan area in the context of the broader landscape, giving due consideration to the relative values of the various resources in particular areas. Plans guide management of NFS lands so that they are ecologically sustainable and contribute to social and economic sustainability; consist of ecosystems and watersheds with ecological integrity and diverse plant and animal communities; and have the capacity to provide people and communities with ecosystem services and multiple uses that provide a range of social, economic, and ecological benefits for the present and into the future. A Forest Plan does not authorize projects or activities or commit the Forest Service to take action. A plan may constrain the agency from authorizing or carrying out projects and activities, or the manner in which they may occur.

The NFMA requires that proposed projects, including third-party proposals subject to permits or rights-of-way grants, be consistent with the Forest Plan of the National Forest (NF) where the project would occur (36 CFR 219.15). When a project is not consistent with the Forest Plan where the project would occur, the Forest Service has the following options: (1) modify the proposed project to make it consistent with the Forest Plan; (2) reject the proposal; (3) amend the Forest Plan so that the project would be consistent with the plan as amended; or (4) amend the Forest Plan contemporaneously with the approval of the project so the project would be consistent with the plan as amended. The fourth option may be limited to apply only to the project (36 CFR 219.15(c)).

For the Pacific Connector pipeline project the Forest Service worked cooperatively with the Federal Energy Regulatory Commission (FERC) staff, other cooperating agencies, and the applicant to incorporate best management practices (BMPs), design features and project requirements which would avoid, minimize, rectify, reduce or eliminate environmental consequences (40 CFR 1502.14(f) and 1508.20(a-d)). The BMPs, design features, or requirements specific to national forest system lands are included as attachments to the project proponent's Plan of Development (POD). There are 28 appendices in the POD; they include draft monitoring elements to ensure that the actions are implemented. Collectively, the POD is incorporated into the project's description, and is summarized in section 2.6.3 of the FEIS.

The Pacific Connector pipeline project, which proposes the most up-to-date engineering and technological practices for pipeline construction and operation, cannot meet some of the standards in the Forest Plans for the Umpqua, Rogue River, and Winema NFs as amended by the Northwest Forest Plan (NWFP) (USDA USDI 1994) (see also FEIS Appendix F1). Standards are mandatory constraints on project and activity decision-making, established to help achieve or maintain desired conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements (36 CFR 219.7(e)(1)(iii)).

Given the linear nature of the pipeline corridor and the topography of the Umpqua, Rogue River, and Winema NFs, it is difficult to avoid every circumstance that would be inconsistent with the management direction and standards and guidelines in the respective Forest Plans. Pacific Connector has cooperated with the Forest Service to make its proposal consistent with the Forest Plans as much as is feasible, but even with route adjustments, modified project design features, and BMPs, it has been determined that if the Right-of-Way Grant were approved for the proposed route crossing these national forests, the Forest Plans would require amendments.

In order to address these inconsistencies, the Forest Service is evaluating Forest Plan amendments to make provision for construction and operation of the Pacific Connector pipeline project. With the exception of boundary changes that add acres to Late Successional Reserves (LSRs) in the Umpqua and Rogue River NFs, the proposed amendments are project-specific and would apply only to the Pacific Connector pipeline project. With the amendments described below, the Pacific Connector pipeline would then be consistent with the Forest Plans.

Forest Plan amendments are guided by direction in the NFMA and its' corresponding regulations. In this appendix proposed amendments to Forest Plans are independently evaluated in the context of the provisions of the forest planning regulations at 36 CFR 219 (2012) as amended in 2016 (planning rule). On December 15, 2016 the Department of Agriculture Under Secretary for Natural Resources and Environment issued a final rule that amended the planning rule (81 FR 90723, 90737). The amendment to the planning rule clarified the Department's direction for amending Forest Plans. The Department also added a requirement for amending a plan for the responsible official to provide in the initial notice "which substantive requirements of §§ 219.8 through 219.11 are likely to be directly related to the amendment" (36 CFR 219.13(b)(2), 81 FR at 90738). This initial notice was provided in the June 26, 2018 Notice of Intent that was Filed by the FERC and the cooperating agencies. Whether a rule provision is directly related to an amendment is determined by any one of the following: the purpose for the amendment, a beneficial effect of the amendment, a substantial adverse effect of the amendment, or a lessening of plan protections by the amendment. If a proposed amendment is determined to be "directly related" to a substantive rule requirement, the Responsible Official must apply that requirement within the scope and scale of the proposed amendment and, if necessary, make adjustments to the proposed amendment to meet the requirement (36 CFR 219.13 (b)(5) and (6)). In other words, additional Forest Plan components may need to be added to the amendment. The proposed Forest Service plan amendments described in the following sections, include an evaluation of the "substantive requirements of §§ 219.8 through 219.11" that are directly related to each amendment.

1.2 COMPENSATORY MITIGATION PLANS

In this appendix Forest Service compensatory mitigation plans (CMPs) are also evaluated in relation to the proposed Forest Plan amendments. The CMPs are in addition to the BMPs, mitigation requirements, and project design requirements described above. Forest Service interdisciplinary teams have developed CMPs for the Pacific Connector pipeline project that are based on the respective Forest Plans, the recommendations of the (2011) northern spotted owl (NSO) recovery plan, the recommendations of the final Southern Oregon and Northern California Coast Coho Salmon Recovery Plan (2014), applicable Late Successional Reserve (LSR) Assessments, and 5th field Watershed Analyses (WA) for watersheds where impacts of the Pacific Connector pipeline Project would occur. The CMPs are also informed by the NWFP monitoring reports and the Synthesis of Science to Inform Land Management within the Forest Plan Area (Spies et. al. 2018). Members of the interdisciplinary team used professional judgment and knowledge of the affected landscapes to develop the mitigation actions described in this appendix. Mitigation measures reduce or compensate for environmental consequences of an action. Offsite mitigation is a supplemental mitigation to address important Forest Plan management objectives that cannot be fully mitigated on-site. Proposed mitigation actions are intended to be responsive to:

- Compliance with the Aquatic Conservation Strategy of the NWFP
- Habitat for Threatened or Endangered (T&E) species including the northern spotted owl and Coho salmon
- Compliance with standards and guidelines for LSRs in the NWFP
- Direction in the National Forest Management Act 2012 planning rule's substantive requirements at 36 CFR §§ 219.8 through 219.11.
- Specific resource issues as they occur by watershed.

The CMP projects are evaluated for each Forest in sections 2.1, 2.2, and 2.3 below. The analysis includes descriptions of the proposed actions, locations (maps), and quantities. The descriptions include an evaluation of the likely short-term impacts and long-term beneficial effects. Although this analysis includes site-specific information, additional surveys and/or environmental analysis may be necessary for some of the projects. These mitigation projects are therefore being analyzed programmatically as a part of the Proposed Action, and may require a secondary site-specific project-level NEPA analysis prior to implementation. The CEQ regulations for NEPA specifically provide for the second phase of a project, such as mitigation, to tier to the EIS of a larger specific action when those subsequent actions are ripe for decision (40 CFR 1508.28). It is anticipated that any NEPA analysis for the proposed mitigation actions would tier to this EIS as site-specific assessments and final project designs are completed. The public would have opportunity to comment on specific project proposals at that time.

The Forest Service does not have funding for the projects in the CMP. The projects would be funded by the applicant (including any planning costs) and would be enforced through conditions in the Right-of-Way grant. The projects in the CMP have been planned to occur within the watersheds impacted by the proposed pipeline in order to compensate for unavoidable adverse impacts in those watersheds. Expecting future federal funding for these projects would be highly speculative especially in light of funding levels for watershed restoration over the last decade. Also there are watersheds in these Forests with higher priority for federal watershed restoration funding. The CMPs discussed in this appendix are summarized in section 2.1.5 of the FEIS. They evolved from previous versions that were independently developed by the Forest Service. A central provision of the Forest Service CMPs is that they remain adaptable to new information and changed conditions.

2.0 FOREST PLAN AMENDMENTS

Proposed amendments and related compensatory mitigation are evaluated in this section. Amendments and compensatory mitigation are unique for each forest and are addressed separately in the following sections.

2.1 UMPQUA NF

There are four proposed amendments to the Umpqua NF Land and Resource Management Plan (1990) (UNF LRMP) for the Pacific Connector pipeline project on the Umpqua NF.[1] An evaluation of how the proposed amendments relate to the planning requirements in 36 CFR 219.8 – 219.11 is discussed in section 2.1.1 below. These proposed amendments are summarized in table 2.1.1-1 along with the project impacts and related project design features (PDF) and compensatory mitigation.[2] The proposed CMP projects are listed in table 2.1.1-2 and evaluated in table 2.1.1-3, table 2.1.1-4 and figure 2.1-5 below. Maps of the proposed CMP projects by watershed are displayed in figures 2.1-1 through 2.1-4.

2.1.1 Evaluation of Umpqua NF Proposed Forest Plan Amendments

The proposed Pacific Connector pipeline incorporates the most up-to-date engineering and technological practices for pipeline construction and operation. However, even with following these practices, it has been determined that one Forest Plan standard associated with rare and/or isolated species (Survey and Manage), and two Forest Plan standards associated with the soil, water, and riparian resources, would need to be modified so that the proposed construction and operation of the Pacific Connector pipeline can be in compliance with the Umpqua NF LRMP as amended by the NWFP and the January 2001 Record of Decision for Amendments to the Survey and Manage Protection Buffer, and Other Mitigation Measures Standards and Guidelines (Survey and Manage ROD).

2.1.1.1 Forest Plan Amendments Related to Rare Aquatic and Terrestrial Plant and Animal Communities (FS-1, UNF-4):

Amendment FS-1: Project-Specific Amendment to Exempt Management Recommendations for Survey and Manage Species on the Umpqua NF.

One Forest Plan standard associated with rare and/or isolated species (Survey and Manage) would need to be modified so that the proposed construction and operation of the Pacific Connector pipeline can be in compliance with the Umpqua NF LRMP as amended. This standard is:

- Management Direction: Manage All Known Sites (Survey and Manage ROD, Standards and Guidelines Page 8). Current and future known sites will be managed according to the Management Recommendation for the species. Professional judgment, Appendix J2 in

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[1] In the DEIS there was a fifth proposed amendment (UNF-2) that would have amended a standard that stated "Utility/transportation corridors, roads or transmission lines may cross but must not parallel streams and lake shores within the riparian unit". The reroute of the pipeline in the East Fork Cow Creek eliminated the parallel alignment and therefore the amendment is no longer needed (see FEIS section 3.4.2.8).

[2] The CMP for the Umpqua NF has been revised from previous versions due to changed conditions from the 2015 Stouts Creek Fire. Additional information is included in Appendix F3 which includes a Stouts Creek Fire Report that discusses the changed conditions and CMP revisions.

the Northwest Forest Plan Final SEIS, and appropriate literature will be used to guide individual site management for those species that do not have Management Recommendations.

The proposed amendment to this standard is:

- Management Direction: Manage All Known Sites (Survey and Manage ROD, Standards and Guidelines Page 8). Current and future known sites will be managed according to the Management Recommendation for the species, **with the exception of the operational right-of-way and the construction zone for the Pacific Connector Pipeline, for which the applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented.** Professional judgment, Appendix J2 in the Northwest Forest Plan Final SEIS, and appropriate literature will be used to guide individual site management for those species that do not have Management Recommendations. (Proposed amendment FS-1 on the Umpqua NF)

While the amendment would provide an exception to meeting this standard, there would also be requirements to do what is appropriate, applicable and feasible to minimize, maintain or restore, maintain or restore any effects of the pipeline's construction and operation on Survey and Manage species within the area affected by the pipeline. Consequently, each amended standard includes the requirement that the "applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented".

The purpose of this project-level amendment is to make the proposed Pacific Connector pipeline project consistent with the Umpqua NF LRMP. Thus, the substantive planning rule requirements that are directly related to this amendment are:

- 36 CFR 219.9(a)(2)(ii) – [the plan must include plan components to maintain or restore] "Rare aquatic and terrestrial plant and animal communities."
- 36 CFR 219.9(b)(1) – "The responsible official shall determine whether or not the plan components required by paragraph (a) provide ecological conditions necessary to: …maintain viable populations of each species of conservation concern within the plan area."

Because the proposed amendment is "directly related" to these two substantive requirements, the Responsible Official must apply the requirements within the scope and scale of the proposed amendment (36 CFR 219.13 (b)(5)).

In considering the "scope and scale" of the amendment, it is important to recognize that the applicable sections of 36 CFR 219.9(a) and (b) that are described above, requires plan components to maintain or restore rare aquatic and terrestrial plant and animal communities, across the entire planning area (i.e., the Umpqua NF). This plan amendment does not alter these LRMP plan requirements for managing rare plant and animal communities across 99.98% of the Umpqua NF. The proposed pipeline construction corridor including the temporary extra work areas (TEWAs) and the uncleared storage areas (UCSAs) is approximately 209acres of the 983,129 acre Umpqua NF. Within this 209 acre construction corridor surveys have identified 69 Survey and Manage sites that could be potentially impacted by construction activities. The proposed amendment does not waive the persistence objective for Survey and Manage species.

The analysis that was conducted (see section 4.6.4.3 of the FEIS and Appendix F5) determined the Survey and Manage persistence objectives would be met. This means that for Umpqua NF lands within the project area, individual sites of Survey and Manage species may be impacted or lost to construction activities, but affected species are expected to persist within the range of the NSO despite the loss of these individual sites.

The amendment modifies this standard so that in the 209 acres of the project construction area the project need not be in compliance with this standard' specific requirements but instead, it is the "applicable mitigation measures identified in the POD and the Pacific Connector Project design requirements" that must be implemented. Or stated in another way, for the 209 acres of National Forest lands that would be within the operational right-of-way and construction zone for the Pacific Connector Pipeline, the management requirement described above would be replaced with the full set of management requirements that comprise the "applicable mitigation measures identified in the POD and Pacific Connector Project Design requirements". The inclusion of these management requirements as a part of the plan component language for the LRMP in this plan amendment, addresses the applicable 36 CFR 219.9(a) and (b) rule requirements within the "scope and scale" of the proposed plan amendments. The sections below describe in more detail how the applicable 36 CFR 219.9(a) and (b) requirements are being addressed.

How the Required Mitigation Measures would Maintain or Restore Effects to Rare Aquatic and Terrestrial Plant and Animal Communities and Meet the Applicable 36 CFR 219.9(a) and 36 CFR 219.9 (b) Requirements

The Forest Service has worked to inventory, analyze, and evaluate rare aquatic, terrestrial plant and animal communities that could be affected by this project. In addition, a third-party consultant for technical support was also utilized in reviewing the information gathered for the project. The POD is a document developed between the FS, BLM, FERC, and PCGP that contains the design features, mitigation measures, roles and responsibilities, monitoring, and procedures for the construction and operation of the pipeline on NFS lands. In addition, FERC's applicant prepared Plan and Procedures for construction and restoration enforceable, where applicable, for additional design features and mitigation. The design requirements and mitigation measures of the POD would be required by the modified standards and incorporated into BLM's ROW grant.

The mitigation measures incorporated into amendments for Survey and Manage species are designed to minimize, maintain or restore the potential for habitat fragmentation, edge effects, and loss of long-term habitats associated with effected species. To ensure adequate restoration and revegetation of the ROW, design features are identified in the *Erosion Control and Revegetation Plan* (POD I), *Right-of-Way Clearing Plan* (POD U), *Leave Tree Protection Plan* (POD P). In addition, routing considerations were identified during project development to ensure avoidance of known populations of rare plant and animal communities (See Chapter 3.4.2 of the FEIS). As well as, Appendix F.5, *Survey and Manage Persistence Evaluations*, and proposed amendment UNF-4 Reallocation of Matrix Lands to LSR.

As a basis for Survey and Manage determinations, Appendix F.5 provides background research on Survey and Manage species that could be affected by the PCGP Project; a review of survey reports prepared by others for the PCGP Project; and processing and analysis of spatial data obtained from the Bureau of Land Management (BLM), Forest Service, and other sources over the past 12 years. Background information was used in combination with new information available as a result of surveys for the PCGP Project and recent surveys in other portions of old growth forests to discuss the currently known distribution of the species in old growth forests within the NSO range. Impacts to sites as a result of the PCGP Project were analyzed to determine if the species would continue to have a reasonable assurance of persistence in the NSO range following implementation of the PCGP Project, taking into consideration the status and distribution of the species and general habitat in the NSO range.

Some of the required mitigation measures in the POD sections to protect rare plant and animal communities include: flagging existing snags on the edges of the construction right-of-way or TEWAs where feasible to save from clearing; snags would be saved as and used in LWD placement post-construction to benefit primary and secondary cavity nesting birds, mammals, reptiles, and amphibians; other large diameter trees on the edges of the construction right-of-way and TEWAs would also be flagged to save/protect as green recruitment or habitat/shade trees, where feasible; trees would be girdled to create snags to augment the number of snags along the right-of-way to benefit cavity nesting birds, mammals, reptiles, and amphibians. See POD's P & U and section 2.6.3 — Monitoring by Land Managing Agencies on Federal Lands of the FEIS for a complete list of applicable mitigation measures for pipeline construction. Additional measures include low ground weight (pressure) vehicles would be used; logging machinery would be restricted to the 30-foot permanent right-of-way wherever possible to prevent soil compaction; the removal of soil duff layers would be avoided in order to maintain a cushion between the soil and the logs and the logging equipment; designed skid trails would be used to restrict detrimental soil disturbance (compaction and displacement) to a smaller area of the right-of-way over the pipeline trenching area; and the temporary construction area would be restored and revegetated using native seeds, to the extent possible, and saplings (POD I).

In an effort to minimize, maintain or restore the impacts to Survey and Manage species, PCGP adopted route variations to avoid certain species identified in the Survey and Manage Persistence Evaluations by co-locating the proposed construction corridor adjacent to existing roads, through managed timber stands or otherwise avoid unique LSOG habitats to the maximum extent practicable (See Chapter 3.4.2, FEIS).

During construction of the Project, Compliance Monitors representing FERC are present on a full-time basis to inspect construction procedures and mitigation measures and provide regular feedback on compliance issues to FERC and the Forest Service. Objectives of the Compliance Monitoring program are to facilitate the timely resolution of compliance issues in the field; provide continuous information to FERC regarding noncompliance issues and their resolution; and review, process, and track construction-related variance requests. Changes to previously approved mitigation measures, construction procedures, and construction work areas due to unforeseen or unavoidable site conditions would require various levels of regulatory approval from the applicable land management agencies. FERC would have the authority to stop any activity that violates an environmental condition of the FERC authorization issued to PCGP.

Additionally, environmental compliance oversight responsibilities for PCGP, FERC, FS and BLM are described in the POD (Environmental Briefings and Compliance Plan, POD G) that would apply to the construction, operation, and maintenance of the project specifically on NFS lands. The FS Authorized Officer would coordinate with the BLM in administering and enforcing ROW grant provisions and would have stop-work authority. The FS Authorized Officer's designated representatives would ensure that the stipulations and mitigation measures included in the POD that are designed to minimize, maintain or restore the effects to soil, water and riparian resources, are adhered to during project construction, operation, and maintenance. The BLM Authorized Officer would coordinate with the FS to ensure the work is being conducted in accordance with the ROW grant and agreed upon conditions. BLM and the FS would have stop-work authority. Field variance requests would be coordinated with the Authorized Officers.

Amendment UNF-4: Reallocation of Matrix Lands to LSR

The other proposed Forest Plan amendment related to rare aquatic and terrestrial plant and animal communities on the Umpqua NF is UNF-4. This proposed amendment would change the designation of approximately 585 acres from the Matrix land allocation to the LSR land allocation in Sections 7, 18, and 19, T.32S., R.2W.; and Sections 13 and 24, T.32S., R.3W., W.M., OR. (see figure 2.1-4). This change in land allocation is proposed as mitigation for the potential adverse impact of the Pacific Connector Pipeline project on LSR 223 on the Umpqua NF. This is a plan level amendment that would change future management direction for the lands reallocated from Matrix to LSR (for additional information on consistency with LSR Standards and Guidelines see section 4.7.3.6. and Appendix F.3 of the FEIS).

The purpose of this amendment is to make the proposed Pacific Connector pipeline project consistent with the Umpqua NF LRMP. Thus, the substantive planning rule requirements that are directly related to this amendment are:

- 36 CFR 219.8(a)(1)(i) – [the plan must include plan components to maintain or restore] "Interdependence of terrestrial and aquatic ecosystems in the plan area."
- 36 CFR 219.8(b)(1) – [the plan must include plan components to guide the plan area's contribution to social and economic sustainability] "Social, cultural and economic conditions relevant to the area influenced by the plan."
- 36 CFR219.9(b)(1) "The responsible official shall determine whether or not the plan components required by paragraph (a) of this section provide the ecological conditions necessary to: contribute to the recovery of federally listed threatened and endangered species, conserve proposed and candidate species, and maintain a viable population of each species of conservation concern within the plan area,"
- 36 CFR 219.9(a)(2)(ii) – [the plan must include plan components to maintain or restore] "Rare aquatic and terrestrial plant and animal communities."

Because the proposed amendment is "directly related" to these four substantive requirements, the Responsible Official must apply the requirements within the scope and scale of the proposed amendment (36 CFR 219.13 (b)(5)). However, because this proposed amendment would simply modify the area to which existing direction applies, the existing formatting for the planning requirements listed above would be retained (36 CFR 219.13(b)(4)).

In considering the "scope and scale" of the amendment, it is important to recognize that the applicable sections of 36 CFR 219.8 and 219.9 that are described above, requires plan components to maintain or restore rare aquatic and terrestrial plant and animal communities, and provide for social and economic sustainability across the entire planning area (i.e., the Umpqua NF). This plan amendment does not alter these LRMP plan requirements across 99.94% of the Umpqua NF. The proposed land reallocation is approximately 585 acres of the 983,129 acre Umpqua NF. The proposed amendment would benefit rare aquatic and terrestrial plant and animal communities by placing these acres in a late successional reserve where providing habitat for these species is the primary goal.

The timber probable sale quantity (directly related to economic conditions) would not be affected before the Umpqua NF LRMP is revised because the Forest has the capacity to maintain probable sale quantity without the acres of matrix lands that would be reallocated to LSR. If a linear relationship between acres and outputs is assumed, the potential effect would be less than two-tenths of one percent of the Forest's probable sale quantity since this proposed amendment would affect less than two-tenths of one percent of the Forest's matrix land base. This proposed amendment would not prevent future vegetation management activities such as thinning that would benefit LSR habitat and could also contribute to the local forest products industry.

How the Compensatory Mitigation Actions would help to Maintain or Restore Rare Aquatic and Terrestrial Plant and Animal Communities in the Plan Area (36 CFR 219.9(a), 36 CFR 219.9 (b)).

In addition to reallocation of 585 acres of Matrix to LSR, the CMP on the Umpqua NF includes proposals for stand density fuel breaks on 3,105 acres, stand density management on 816 acres, terrestrial habitat improvements on 478 acres and decommissioning approximately 5 miles of roads that would benefit rare plant and animal communities. The CMP on the Umpqua NF also includes proposals to improve aquatic and riparian habitat that would benefit rare aquatic plant and animal communities (see the discussion of *How the Compensatory Mitigation Actions would help to Maintain or Restore the Ecological Integrity of Riparian Areas, Soils, and Soil productivity in the Plan Area (36 CFR 219.8(a)(3)(i), (36 CFR 219.8(a)(2)(ii))* below for a discussion of benefits to aquatic habitats).

Stand density fuel breaks would reduce the threat of losing late-successional habitat to fire. High intensity fire has been identified as the single factor most impacting late successional and old growth forest habitats on federal lands in the area of the NWFP. Construction of the pipeline and associated activities removes both mature and developing stands and would increase fire suppression complexity; however the corridor also provides a fuel break. Fuels reduction adjacent to the corridor would increase the effectiveness of the corridor as a fuel break. Density management would increase longevity of existing mature stands by reducing losses from disease, insects and fire. Stand density management and fuels reduction would lower the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire.

Stand density management would enhance LSOG habitat by increasing the growth, health, and vigor of the trees remaining in the stands, and restoring species and structural diversity to those considered characteristic under a natural disturbance regime. Thinning of young stands is a recognized treatment within LSR if designed to accelerate development of late-successional habitat characteristics. The proposed treatments include 228 acres of pre-commercial thinning, 288 acres of commercial thinning and 300 acres of off-site pine removal. The Pacific Connector pipeline would result in additional fragmentation and preclude the recovery of fragmented habitat for those stands adjacent to the pipeline corridor. Both mature stands and developing stands would be removed during pipeline construction. Density management of forested stands would assist in the recovery of late-seral habitat, impact from fragmentation, reduction in edge effects and enhance resilience of mature stands over time. Accelerating development of mature forest characteristics would shorten the impacts of those biological services loss due to pipeline construction.

Terrestrial habitat improvements include proposals for large woody debris placement on 164 acres, snag creation on 324 acres, noxious weed treatments on 6.7 miles of road and 124 acres of Lupine meadow restoration. Large wood replacement would partially mitigate for the barrier effect of the corridor by creating structure across the corridor for use by small wildlife species. Placement in wood deficient areas adjacent to the corridor allows for scattering of stockpiled wood, reducing localized fuel loads while improving habitat in deficient stands. Larger logs maintain moisture longer and are less likely to be fully consumed by fire. Managing for the proposed levels provide for a greater assurance of species abundance. The objective of snag creation is to mitigate for the immediate and future impacts to snag habitat from the clearing of the pipeline right-of-way. The construction and operation of the pipeline project has the potential to create vectors for noxious weeds. The proposed noxious weed treatments are intended to reduce populations of noxious weeds that are in close proximity to the pipeline project right-of-way. The long-term benefits of meadow restoration would include the restoring of native plant populations and species diversity. Restoring native plant communities and increasing vegetation diversity generally contributes to restoring habitat for a broad group of plant and animal species.

Although the Pacific Connector project has been routed to avoid LSOG habitat as much as possible, the project would cause habitat fragmentation within LSR 223. Road decommissioning reduces the edge effects over time by revegetating road surfaces and eliminating road corridors. Revegetating selected roads in conjunction with the density management proposed for adjacent plantations would create larger blocks of late successional habitat in the future.

These projects have been designed by an interdisciplinary team of resource professionals on the Umpqua NF with input and coordination with the U.S. Fish and Wildlife Service, NOAA Fisheries, and State agencies. They were planned within the watersheds that would be affected by the Pacific Connector pipeline project. They are a component of the PCGP application and would be a requirement of the Right-of-Way grant. Overall, these projects would help maintain and restore rare aquatic and terrestrial plant and animal communities on the Umpqua NF (see tables 2.1.1-3 and 2.1.1-4 and figures 2.1-1 through 2.1-5 for additional information).

2.1.1.2 Forest Plan Amendments Related to Soil, Water and Riparian Areas (UNF-1, and UNF-3):[3]

Two Forest Plan standards associated with the soil, water, and riparian resources would need to be modified so that the proposed construction and operation of the Pacific Connector pipeline can be in compliance with the Umpqua NF LRMP. These standards are:

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[3] The DEIS included (UNF-2) that would have amended a standard that stated “Utility/transportation corridors, roads or transmission lines may cross but must not parallel streams and lake shores within the riparian unit”. The reroute of the pipeline in the East Fork Cow Creek eliminated the parallel alignment and therefore the amendment is no longer needed (see FEIS section 3.4.2.8).

- Standard & Guideline 1 (UNF LRMP IV-33). Maintain all effective shading vegetation on perennial streams. Utilize silvicultural practices to establish shade on perennial streams where currently lacking.
- Standard & Guideline 1 (UNF LRMP IV-67). The combined total amount of unacceptable soil condition (detrimental compaction, displacement, puddling or severely burned) within an activity area (e g., cutting unit, range allotment, site preparation area) should not exceed 20 percent. All roads and landings, unless rehabilitated to natural conditions, are considered to be in detrimental condition, and are included as part of this 20 percent.

The proposed amendments to these standards are:

- Standard & Guideline 1 (UNF LRMP IV-33). Maintain all effective shading vegetation on perennial streams, **with the exception of the operational right-of-way and the construction zone for the Pacific Connector Pipeline, for which the applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented.** Utilize silvicultural practices to establish shade on perennial streams where currently lacking. (proposed amendment UNF-1)
- Standard and Guideline 1 (UNF LRMP IV-67). The combined total amount of unacceptable soil condition (detrimental compaction, displacement, puddling or severely burned) within an activity area (e g., cutting unit, range allotment, site preparation area) should not exceed 20 percent. All roads and landings, unless rehabilitated to natural conditions, are considered to be in detrimental condition, and are included as part of this 20 percent, **with the exception of the operational right-of-way and the construction zone for the Pacific Connector Pipeline, for which the applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented.** (proposed amendment UNF-3)

While the amendments would provide an exception to meeting these standards, there would also be requirements to do what is appropriate, applicable and feasible to minimize, maintain or restore any effects of the pipeline's construction and operation on the soil, water and riparian resources within the area affected by the pipeline. Consequently, each amended standard includes the requirement that the "applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented".

The purpose of these two project-level amendments is to make the proposed Pacific Connector pipeline project consistent with the Umpqua NF LRMP. Thus, the substantive planning rule requirements that are directly related to these two amendments are:

- 36 CFR 219.8(a)(3)(i) – The plan must include plan components "to maintain or restore the ecological integrity of riparian areas in the plan area, including plan components to maintain or restore structure, function, composition, and connectivity.
- 36 CFR 219.8(a)(2)(ii) – [The plan must include plan components to maintain or restore] "soils and soil productivity, including guidance to reduce soil erosion and sedimentation."

Because the two proposed amendments are "directly related" to these two substantive requirements, the Responsible Official must apply the requirements within the scope and scale of the proposed amendments (36 CFR 219.13 (b)(5)).

In considering the "scope and scale" of the two amendments, it is important to recognize that the applicable sections of 36 CFR 219.8(a) that are described above, requires plan components to "maintain or restore" the soil, water and riparian resources across the entire planning area (i.e., the Umpqua NF). These plan amendments do not alter these LRMP plan requirements for managing the soil, water, and riparian resources across 99.98% of the Umpqua NF. The proposed pipeline construction corridor including the TEWAs and the UCSAs is approximately 209 acres of the 983,129 acre Umpqua NF. Of the 209 acres of pipeline corridor construction it is estimated that approximately 3 of these acres would not meet the standards for riparian area management described above and approximately 54 to 127 acres would not meet standards for soils described above.

The amendments modify two standards so that in the 209 acres of the project construction area the project need not be in compliance with these standards' specific requirements but instead, it is the "applicable mitigation measures identified in the POD and the Pacific Connector Project design requirements" that must be implemented. Or stated in another way, for the 209 acres of National Forest lands that would be within the operational right-of-way and construction zone for the Pacific Connector Pipeline, the two management requirements described above would be replaced with the full set of management requirements that comprise the "applicable mitigation measures identified in the POD and Pacific Connector Project Design requirements". The inclusion of these management requirements as a part of the plan component language for the LRMP in this plan amendment, addresses the applicable 36 CFR 219.8(a) rule requirements within the "scope and scale" of these proposed plan amendments. The sections below describe in more detail how the applicable 36 CFR 219.8(a) requirements are being addressed.

How the Required Mitigation Measures would Maintain or Restore Effects to Soil, Water, and Riparian Resources and Meet the Applicable 36 CFR 219.8(a) Requirements

The Forest Service has worked with Pacific Connector Gas Pipeline (PCGP) to inventory, analyze, and evaluate the geologic, soil, and hydrologic resources that could be affected by this project. In addition, a third-party consultant for technical support was also utilized in reviewing the information gathered for the project. The POD is a document developed between the FS, BLM, FERC, and PCGP that contains the design features, mitigation measures, roles and responsibilities, monitoring, and procedures for the construction and operation of the pipeline on NFS lands. In addition, FERC's applicant prepared Plan and Procedures for construction and restoration are enforceable, where applicable, for additional design features and mitigation. The design requirements and mitigation measures of the POD would be required by the modified standards and incorporated into BLM's ROW grant.

The mitigation measures, incorporated into amendments for soil, water, and riparian resources are designed to minimize, maintain or restore the potential for soil movement, slope stability, water quality, and to ensure adequate restoration and revegetation. These measures are identified in: the *Erosion Control and Revegetation Plan* (POD I); *Right-of-Way Clearing Plan* (POD U); *Wetland and Waterbody Crossing Plan* (POD BB); the *Forest Service Site Specific Stream Crossing Prescriptions* (NSR 2014); the *Stream Crossing Risk Analysis*; and *Stream Crossing*

Risk Analysis Addendum (GeoEngineers2017d, 2018a). PCGP would also follow the FERC's applicant prepared Wetland Procedures and the Best Management Practices for the State of Oregon. To further reduce potential for landslides on steep slopes, the Forest Service, BLM, and FERC are also recommending additional industry best management practices and measures identified from the *Technical Report on Soil Risk and Sensitivity Assessment* (NSR 2014) be incorporated into PCGP's terms and conditions of the Right-of-Way Grant as described in the POD's identified above. See 4.2.3.3 of the FEIS for a description of soil risk and sensitivity assessment.

Areas with soils rated moderate to very high for risk or sensitivity (39 acres total) would be recommended for more site-specific validation of the risk criteria used in the *Technical Report on Soil Risk and Sensitivity Assessment* (NSR 2014) to confirm that specific locations merit consideration of the more aggressive soil remediation measures, such as: a 2- to 3-inch organic mulch surface application (80 percent coverage) of woodchips, logging slash, and/or straw; adaptive seed mixes and vegetation to better fit site conditions; deep subsoil decompaction with hydraulic excavators that leave constructed corridor mounded and rough with maximum water infiltration so that water cannot flow downhill for any appreciable distance; more aggressive use of constructed surface water runoff dispersion structures such as closely placed and more pronounced slope dips and water bars, etc.; more aggressive use of constructed surface runoff entrapments such as silt fencing, sediment settling basins, or straw bale structures, etc.; more aggressive placement (100 percent coverage) and depth (3 to 4 inches) of ground cover using woodchips, logging slash, straw bales, wattles (see POD's U and I). In efforts to protect soil productivity, topsoil segregation would be required for pipeline construction at wetland and waterbody crossings on NFS lands (POD U).

Some of the required mitigation measures in the POD BB and *Forest Service Site Specific Stream Crossing Prescriptions* (NSR 2014) to protect wetlands and minimize, maintain or restore compaction include: limiting the construction right-of-way width to 75 feet through wetlands; placing equipment on mats; using low-pressure ground equipment; limiting equipment operation and construction traffic along the right-of-way; locating temporary workspace (TEWAS) more than 50 feet away from wetland boundaries; cutting vegetation at ground level; limiting stump removal to the construction trench; segregating the top 12 inches of soil, or to the depth of the topsoil horizon; using "push-pull" techniques in saturated wetlands; limiting the amount of time that the trench is open by not trenching until the pipe is assembled and ready for installation; not using imported rock and soils for backfill; and not using fertilizer, lime, or mulch during restoration in wetlands. PCGP must also follow the FERC Waterbody and Wetland Construction and Mitigation Procedures. See 4.3.3.2 of the FEIS for a complete list of applicable mitigation measures for pipeline construction at specific waterbody and stream crossings.

In an effort to minimize, maintain or restore the impacts to streams and riparian areas, PCGP adopted route variations to co-locate the proposed construction corridor adjacent to existing roads and along dry ridge tops (See Chapter 3.4.2, FEIS). In addition, PCGP has committed to limit construction at waterbody crossings to times of dry weather or low water flow. PCGP would implement the required erosion control measures at the proposed stream crossings to minimize, maintain or restore potential erosion and sedimentation impacts. The applicable mitigation measures and monitoring requirements in the POD relating to water waterbody crossings are included in the *Site Specific Forest Service Stream Crossing Prescriptions, and Wetland and Waterbody Crossing Plan* (POD BB). In addition, applicable mitigation measures from the FERC approved applicant prepared Procedures for Wetland and Waterbody Crossings would be required.

During construction of the Project, Compliance Monitors representing FERC are present on a full-time basis to inspect construction procedures and mitigation measures and provide regular feedback on compliance issues to FERC and the Forest Service. Objectives of the Compliance Monitoring program are to: facilitate the timely resolution of compliance issues in the field; provide continuous information to FERC regarding noncompliance issues and their resolution; and review, process, and track construction-related variance requests. Changes to previously approved mitigation measures, construction procedures, and construction work areas due to unforeseen or unavoidable site conditions would require various levels of regulatory approval from the applicable land management agencies. FERC would have the authority to stop any activity that violates an environmental condition of the FERC authorization issued to PCGP.

Additionally, environmental compliance oversight responsibilities for PCGP, FERC, FS and BLM are described in the POD (Environmental Briefings and Compliance Plan, POD G) that would apply to the construction, operation, and maintenance of the project specifically on NFS lands. The FS Authorized Officer would coordinate with the BLM in administering and enforcing ROW grant provisions and would have stop-work authority. The FS Authorized Officer's designated representatives would ensure that the stipulations and mitigation measures included in the POD that are designed to minimize, maintain or restore the effects to soil, water and riparian resources, are adhered to during project construction, operation, and maintenance. The BLM Authorized Officer would coordinate with the FS to ensure the work is being conducted in accordance with the ROW grant and agreed upon conditions. BLM and the FS would have stop-work authority. Field variance requests would be coordinated with the Authorized Officers.

How the Compensatory Mitigation Actions would help to Maintain or Restore the Ecological Integrity of Riparian Areas, Soils, and Soil productivity in the Plan Area (36 CFR 219.8(a)(3)(i), (36 CFR 219.8(a)(2)(ii)).

Part of the CMP on the Umpqua NF includes proposals to remove eleven old culverts that may block fish passage either by poor design or by failure over time, decommission approximately 7.2 miles and storm proof approximately 11.4 miles of road.

Removing culverts that block fish passage and replacing them with fish-friendly designs can allow fish and other aquatic organisms to access previously unavailable habitat. Stream crossing replacement would directly improve stream connectivity and habitat for aquatic species by immediately restoring access to formerly inaccessible habitats. Indirectly, these projects would reduce potential sediment levels in the long term by decreasing the potential for road failure. Stream crossing projects also reduce stream velocities by increasing stream crossing sizes, eliminating flow restrictions and allowing passage to additional reaches of habitat by removing barriers to aquatic species which improves access to spawning and rearing habitat and allows unrestricted movement throughout stream reaches during seasonal changes in water levels (Hoffman 2007).

Decommissioning and storm proofing roads can substantially reduce sediment delivery to streams (Madej 2000; Keppeler et al. 2007). Proposed road decommissioning and storm proofing would increase infiltration of precipitation, reduce surface runoff, and reduce sediment production from road-related surface erosion in the watershed where the impacts from the Project would occur. Decommissioning roads would restore natural drainage patterns and thereby avoid large volumes of added sediment to the stream network that would be likely to eventually occur. In addition limited road maintenance dollars could be focused on the remaining road systems resulting in more maintenance of culverts and ditchlines resulting in less potential for catastrophic failure. Madej (2000) concluded that by eliminating the risk of stream diversions and culvert failures, road removal treatments significantly reduce long-term sediment production from retired logging roads.

These projects have been designed by an interdisciplinary team of resource professionals on the Umpqua NF with input and coordination with the U.S. Fish and Wildlife Service, NOAA Fisheries, and State agencies. They were planned within the watersheds that would be affected by the Pacific Connector pipeline project. They are a component of the PCGP application and would be a requirement of the Right-of-Way grant. Overall, these projects would help maintain and restore riparian and soil resources on the Umpqua NF (see tables 2.1.1-3 and 2.1.1-4 and figures 2.1-1 through 2.1-5 for additional information).

TABLE 2.1.1-1

Proposed LRMP Amendments on the Umpqua NF

Amendment	**Description**	**Text of Proposed Amendment**	**Related Planning Rule Requirements**	**Pacific Connector pipeline Impacts**	**Project Design Features**	**Compensatory Mitigation**[4]
FS-1: Project-Specific Amendment to Exempt Management Recommendations for Survey and Manage Species on the Umpqua NF.	The Umpqua NF LRMP (UNF LRMP 1990) would be amended to exempt certain known sites within the area of the proposed Pacific Connector right-of-way grant from the Management Recommendations required by the 2001 "Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (Survey and Manage ROD) (USDA USDI 2001). For known sites within the proposed right-of-way that cannot be avoided, the 2001 Management Recommendations for protection of known sites of Survey and Manage species would not apply. For known sites located outside the proposed right-of-way but with an overlapping protection buffer only that portion of the buffer within the right-of-way would be exempt from the protection requirements of the Management Recommendations. Those Management Recommendations would remain in effect for that portion of the protection buffer that is outside of the right of way. The proposed amendment would not exempt the Forest Service from the requirements of the Survey and Manage ROD, as modified, to maintain species persistence for affected Survey and Manage species within the range of the northern spotted owl. This is a project-specific plan amendment applicable only to the Pacific Connector Pipeline Project and would not change future management direction for any other project. The amendment would provide an exception from these standards for the Pacific Connector Project and include specific mitigation measures and project design requirements for the project.	Management Direction: Manage All Known Sites (Survey and Manage ROD, Standards and Guidelines Page 8). Current and future known sites will be managed according to the Management Recommendation for the species, **with the exception of the operational right-of-way and the construction zone for the Pacific Connector Pipeline, for which the applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented.** Professional judgment, Appendix J2 in the Northwest Forest Plan Final SEIS, and appropriate literature will be used to guide individual site management for those species that do not have Management Recommendations.	The 36 CFR 219 planning rule requirements that are directly related to this amendment include: § 219.9(a)(2)(ii) – [the plan must include plan components to maintain or restore] "Rare aquatic and terrestrial plant and animal communities." § 219.9(b)(1) – "The responsible official shall determine whether or not the plan components required by paragraph (a) provide ecological conditions necessary to: …maintain viable populations of each species of conservation concern within the plan area."	68 acres of late successional and old growth (LSOG) habitat directly impacted from construction activity[5] 209 total acres directly impacted from construction activity 69 survey and manage sites potentially impacted This amendment would affect less than 0.02% of the Umpqua NF	POD (I) Erosion Control and Revegetation Plan POD (J) Plant Conservation Plan POD (P) Leave Tree Protection Plan POD (U) Right-of-Way Clearing Plan Chapter 3, FEIS Route Design and Modifications on NFS lands Appendix F5, Survey and Manage Persistence Evaluations	Reallocation of Matrix Lands to LSR – 585 Acres Stand Density Fuel Break - 3,105 acres Stand Density Management – 816 acres Terrestrial Habitat Improvements – 478 acres Road Decommissioning in LSR – 5 miles
UNF-1: Project-Specific Amendment to Allow Removal of Effective Shade on Perennial Streams.	The Umpqua NF LRMP would be amended to exempt the Standards and Guidelines for Fisheries (Umpqua NF LRMP, page IV-33, Forest-Wide) to allow the removal of effective shading vegetation where perennial streams are crossed by the Pacific Connector right-of-way. This change would potentially affect an estimated total of three acres of	Standard & Guideline 1 (UNF LRMP IV-33). Maintain all effective shading vegetation on perennial streams, **with the exception of the operational right-of-way and the construction zone for**	The 36 CFR 219 planning rule requirements that are directly related to this amendment include: § 219.8(a)(3)(i) – The plan must include plan components "to maintain or restore the ecological integrity	3 acres of effective shading vegetation would be removed This amendment would affect less than 0.001% of the Umpqua NF	POD (I) Erosion Control and Revegetation Plan POD (U) Right-of-Way Clearing Plan	Aquatic and Riparian Habitat – fish passage improvement - 11 sites Road Decommissioning – 7.2 miles

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[4] The compensatory mitigation listed in this column reflects the mitigation most related to the proposed amendment. It should be noted that other actions in the CMP may also be beneficial.

[5] Direct Impacts include acres cleared for construction in the construction corridor and temporary extra work areas (TEWA), as well as acres modified from uncleared storage areas (UCSA)

TABLE 2.1.1-1

Proposed LRMP Amendments on the Umpqua NF

Amendment	Description	Text of Proposed Amendment	Related Planning Rule Requirements	Pacific Connector pipeline Impacts	Project Design Features	Compensatory Mitigation[4]
	effective shading vegetation at approximately five perennial stream crossings in the East Fork of Cow Creek subwatershed from pipeline mileposts (MP) 109 to 110 in Sections 16 and 21, T.32S., R.2W., W.M., OR. The amendment would provide an exception from these standards for the Pacific Connector Pipeline Project and include specific mitigation measures and project design requirements for the project. This is a project-specific plan amendment applicable only to the Pacific Connector Pipeline Project and would not change future management direction for any other project.	**the Pacific Connector Pipeline, for which the applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented.** Utilize silvicultural practices to establish shade on perennial streams where currently lacking.	of riparian areas in the plan area, including plan components to maintain or restore structure, function, composition, and connectivity."		POD (BB) Wetland and Waterbody Crossing Plan Forest Service Site Specific Stream Crossing Prescriptions (NSR 2014) Stream Crossing Risk Analysis; and Stream Crossing Risk Analysis Addendum (GeoEngineers2017d, 2018a) Chapter 3,FEIS Route Design and Modifications on Forest Service Managed Lands	Road Storm-proofing 11.4 miles
UNF-3: Project-Specific Amendment to Exempt Limitations on Detrimental Soil Conditions within the Pacific Connector Right-of-Way in All Management Areas.	The Umpqua NF LRMP would be amended to exempt limitations on the area affected by detrimental soil conditions from displacement and compaction within the Pacific Connector right-of-way. Standards and Guidelines for Soils (LRMP page IV-67) requires that not more than 20 percent of the project area have detrimental compaction, displacement, or puddling after completion of a project. The amendment would provide an exception from these standards for the Pacific Connector Pipeline Project and include specific mitigation measures and project design requirements for the project. This is a project-specific plan amendment applicable only to the Pacific Connector Pipeline Project and would not change future management direction for any other project.	Standard and Guideline 1 (UNF LRMP IV-67). The combined total amount of unacceptable soil condition (detrimental compaction, displacement, puddling or severely burned) within an activity area (e g., cutting unit, range allotment, site preparation area) should not exceed 20 percent. All roads and landings, unless rehabilitated to natural conditions, are considered to be in detrimental condition, and are included as part of this 20 percent, **with the exception of the operational right-of-way and the construction zone for the Pacific Connector Pipeline, for which the applicable mitigation measures identified in the POD and Pacific Connector project design requirements must**	The 36 CFR 219 planning rule requirements that are directly related to this amendment include: § 219.8(a)(2)(ii) – [The plan must include plan components to maintain or restore] "soils and soil productivity, including guidance to reduce soil erosion and sedimentation."	Approximately between 54 and 127 acres of detrimental soil conditions could result from the pipeline construction This amendment would affect approximately 0.01% of the Umpqua NF	POD (I) Erosion Control and Revegetation Plan POD (U) Right-of-Way Clearing Plan Technical Report on Soil Risk and Sensitivity Assessment (NSR 2014)	Road Decommissioning – approximately 7.2 miles Road Storm-proofing approximately 11.4 miles

TABLE 2.1.1-1

Proposed LRMP Amendments on the Umpqua NF

Amendment	**Description**	**Text of Proposed Amendment**	**Related Planning Rule Requirements**	**Pacific Connector pipeline Impacts**	**Project Design Features**	**Compensatory Mitigation[4]**
		be implemented.				
UNF-4: Reallocation of Matrix Lands to LSR	The Umpqua NF LRMP would be amended to change the designation of approximately 585 acres from Matrix land allocations to the LSR land allocation in Sections 7, 18, and 19, T.32S., R.2W.; and Sections 13 and 24, T.32S., R.3W., W.M., OR. This change in land allocation is proposed to partially mitigate the potential adverse impact of the Pacific Connector Pipeline Project on LSR 223 on the Umpqua NF. This is a plan level amendment that would change future management direction for the lands reallocated from Matrix to LSR.		The 36 CFR 219 planning rule requirements that are directly related to this amendment include: § 219.8(a)(1)(i) – [the plan must include plan components to maintain or restore] "Interdependence of terrestrial and aquatic ecosystems in the plan area." § 219.8(b)(1) – [the plan must include plan components to guide the plan area's contribution to social and economic sustainability] "Social, cultural and economic conditions relevant to the area influenced by the plan." § 219.9(b)(1) "The responsible official shall determine whether or not the plan components required by paragraph (a) of this section provide the ecological conditions necessary to: contribute to the recovery of federally listed threatened and endangered species, conserve proposed and candidate species, and maintain a viable population of each species of conservation concern within the plan area," and § 219.9(a)(2)(ii) – [the plan must include plan components to maintain or restore] "Rare aquatic and terrestrial plant and animal communities."	Approximately 20 acres of LSOG and 48 acres of Non-LSOG habitat would be cleared within LSR 223 This amendment would affect approximately 0.06% of the Umpqua NF	POD (I) Erosion Control and Revegetation Plan POD (U) Right-of-Way Clearing Plan	Reallocation of Matrix Lands to LSR – approximately 296 acres of LSOG and 289 acres of Non-LSOG habitat would be reallocated from matrix to LSR 223 Stand Density Fuel Break - 3,105 acres Stand Density Management – 816 acre Terrestrial Habitat Improvement – 478 acres Road Decommissioning in LSR – 5 miles

TABLE 2.1.1-2

Mitigation Projects to Address LRMP Objectives on the Umpqua NF

Unit	Watershed	Mitigation Group	Project Type	Project Name	Quantity a/	Unit
Umpqua NF	Days Creek - South Umpqua	Stand Density Fuel Break	Fuels Reduction	Days Creek - South Umpqua Matrix Integrated Fuels Reduction	194	acres
		Stand Density Fuel Break	Fuels Reduction	Days Creek - South Umpqua LSR Integrated Fuels Reduction	254	acres
		Terrestrial Habitat Improvement	Snag Creation	Days Creek - South Umpqua LSR Snag Creation	32	acres
		Terrestrial Habitat Improvement	Snag Creation	Days Creek - South Umpqua Matrix Snag Creation	14	acres
		Terrestrial Habitat Improvement	Lupine Meadow Restoration	Upper Cow Creek Lupine Meadow Restoration	23	acres
	Elk Creek - South Umpqua	Aquatic and Riparian Habitat	Fish Passage	Elk Creek Fish Passage Culverts	5	sites
		Road sediment reduction	Road Storm-proofing	Elk Creek Road Storm-proofing	9.2	miles
		Road sediment reduction	Road Decommissioning	Elk Cr. Road Decommissioning	5.9	miles
		Stand Density Fuel Break	Fuels Reduction	Elk Creek Matrix Integrated Fuels Reduction	176	acres
		Stand Density Management	Commercial Thinning	Elk Creek LSR Enhancement	91	acres
		Stand Density Management	Off-site Pine Removal	Elk Creek LSR Off-site Pine Removal	300	acres
		Terrestrial Habitat Improvement	LWD Upland Placement	Elk Creek LSR LWD Placement	99	acres
		Terrestrial Habitat Improvement	Lupine Meadow Restoration	Elk Creek LSR Lupine Meadow Restoration	101	acres
		Terrestrial Habitat Improvement	Noxious Weed Treatment	Elk Creek Roadside Noxious Weeds	6.7	miles
		Terrestrial Habitat Improvement	Snag Creation	Elk Creek LSR Snag Creation	68	acres
		Fire Suppression	Water Source Improvement	Elk Creek Pump Chance	2	sites
	Evans Creek	Stand Density Fuel Break	Road Shaded Fuel Break	Evans Cr LSR Road Shaded Fuel Break	63	acres
	Trail Creek	Road sediment reduction	Road Decommissioning	Trail Creek Road Decommissioning	0.3	miles
		Road sediment reduction	Road Storm-proofing	Trail Creek Storm-proofing	2.2	miles
		Stand Density Fuel Break	Fuels Reduction	Trail Creek Matrix Integrated Fuels Reduction	500	acres
		Stand Density Fuel Break	Road Shaded Fuel Break	Trail Creek LSR Road Shaded Fuel Break	175	acres
		Terrestrial Habitat Improvement	Snag Creation	Trail Creek Matrix Snag Creation	109	acres
		Stand Density Management	Pre-commercial Thinning	Trail Creek LSR PCT Enhancement	112	acres
	Upper Cow Creek	Aquatic and Riparian Habitat	Fish Passage	Upper Cow Creek Fish Passage Culverts	6	sites
		Fire Suppression	Water Source Improvement	Upper Cow Creek Pump Chance	1	site
		Road Sediment Reduction	Road Closure	Upper Cow Creek Road Closure	1.2	miles
		Road Sediment Reduction	Road Decommissioning	Upper Cow Creek Road Decommissioning	1.0	miles
		Stand Density Fuel Break	Fuels Reduction	Upper Cow Creek LSR Integrated Fuels Reduction	635	acres

TABLE 2.1.1-2

Mitigation Projects to Address LRMP Objectives on the Umpqua NF

Unit	Watershed	Mitigation Group	Project Type	Project Name	Quantity a/	Unit
		Stand Density Fuel Break	Fuels Reduction	Upper Cow Creek Matrix Integrated Fuels Reduction	730	acres
		Stand Density Fuel Break	Road Shaded Fuel Break	Upper Cow Creek LSR Road Shaded Fuel Break	378	acres
		Stand Density Management	Commercial Thin	Upper Cow Creek LSR Enhancement	197	acres
		Stand Density Management	Pre-commercial Thinning	Elk Creek LSR PCT Enhancement	116	acres
		Terrestrial Habitat Improvement	LWD Upland Placement	Upper Cow Creek LSR LWD Placement	65	acres
		Terrestrial Habitat Improvement	Snag Creation	Upper Cow Creek LSR Snag Creation	90	acres
		Terrestrial Habitat Improvement	Snag Creation	Upper Cow Creek Matrix Snag Creation	11	acres
		Reallocation of Matrix Lands to LSR	Land Re-Allocation from Matrix to LSR	LRMP Amendment UNF 4 LSR 223 Reallocation	585	acres

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a/ Acres are rounded to the nearest whole acre and miles to the nearest tenth of a mile.

Figure 2.1-1. Map of CMP Projects in the Days Creek Watershed on the Umpqua NF

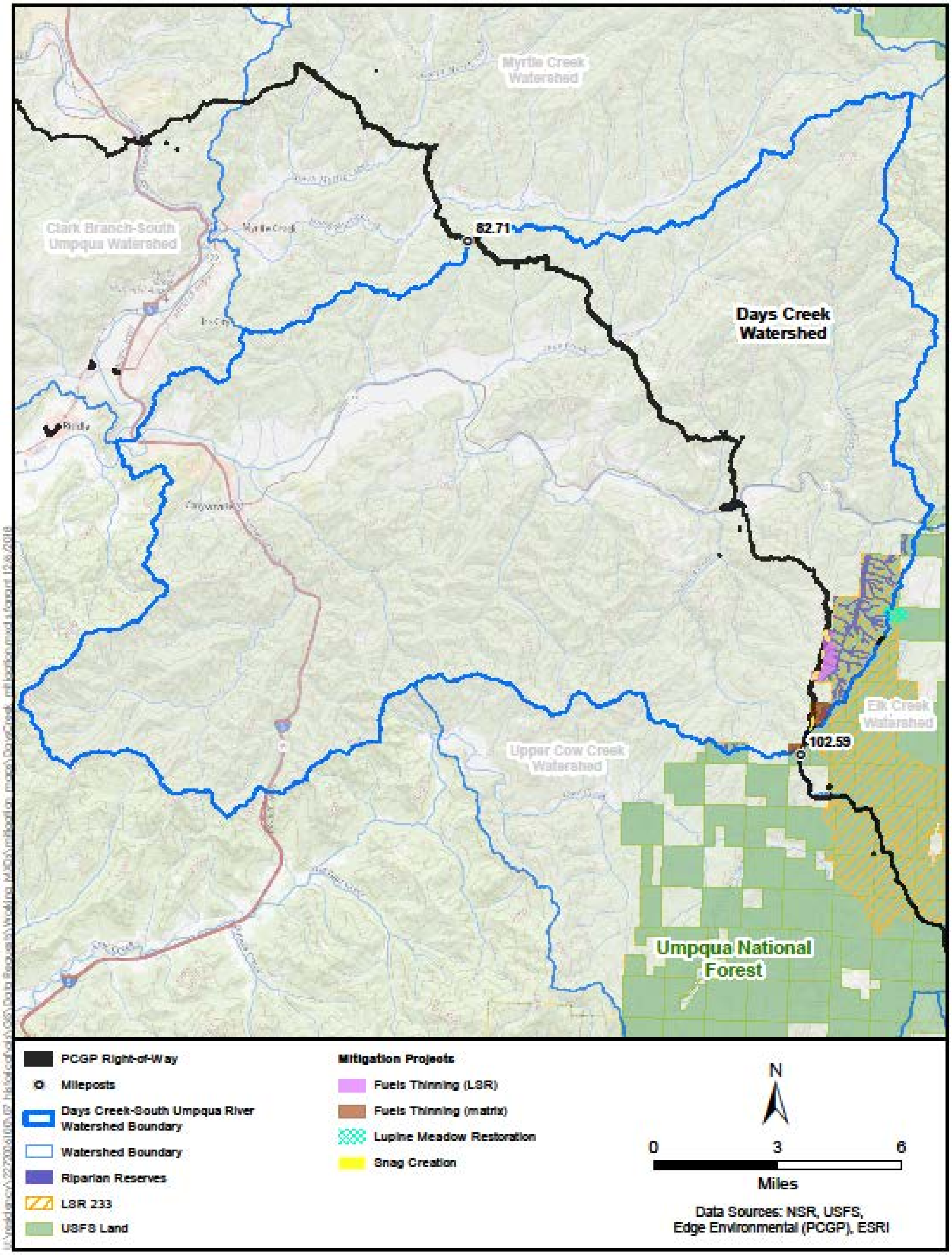


Figure 2.1-2. Map of CMP Projects in the ELK Creek Watershed on the Umpqua NF

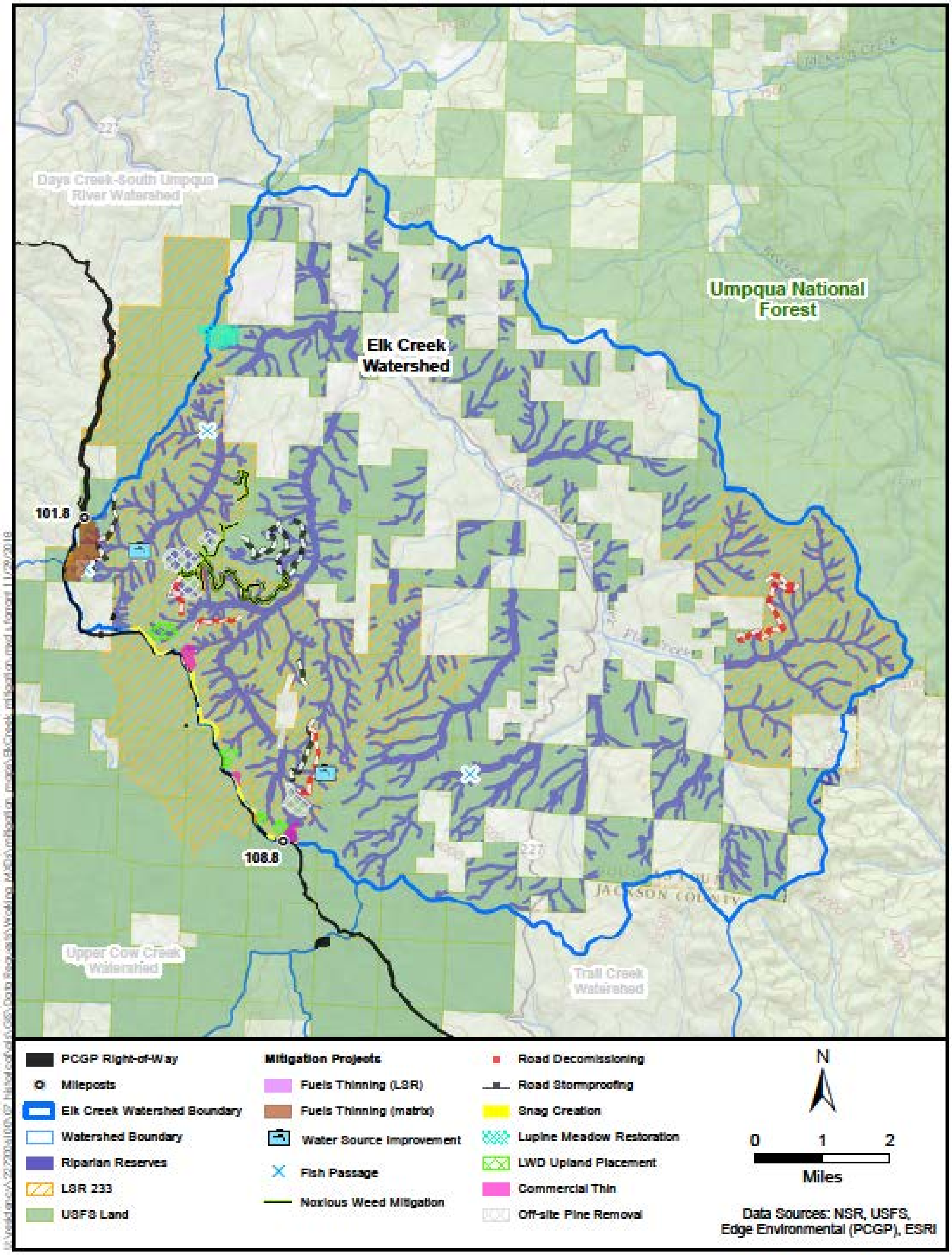


Figure 2.1-3. Map of CMP Projects in the Upper Cow Creek Watershed on the Umpqua NF

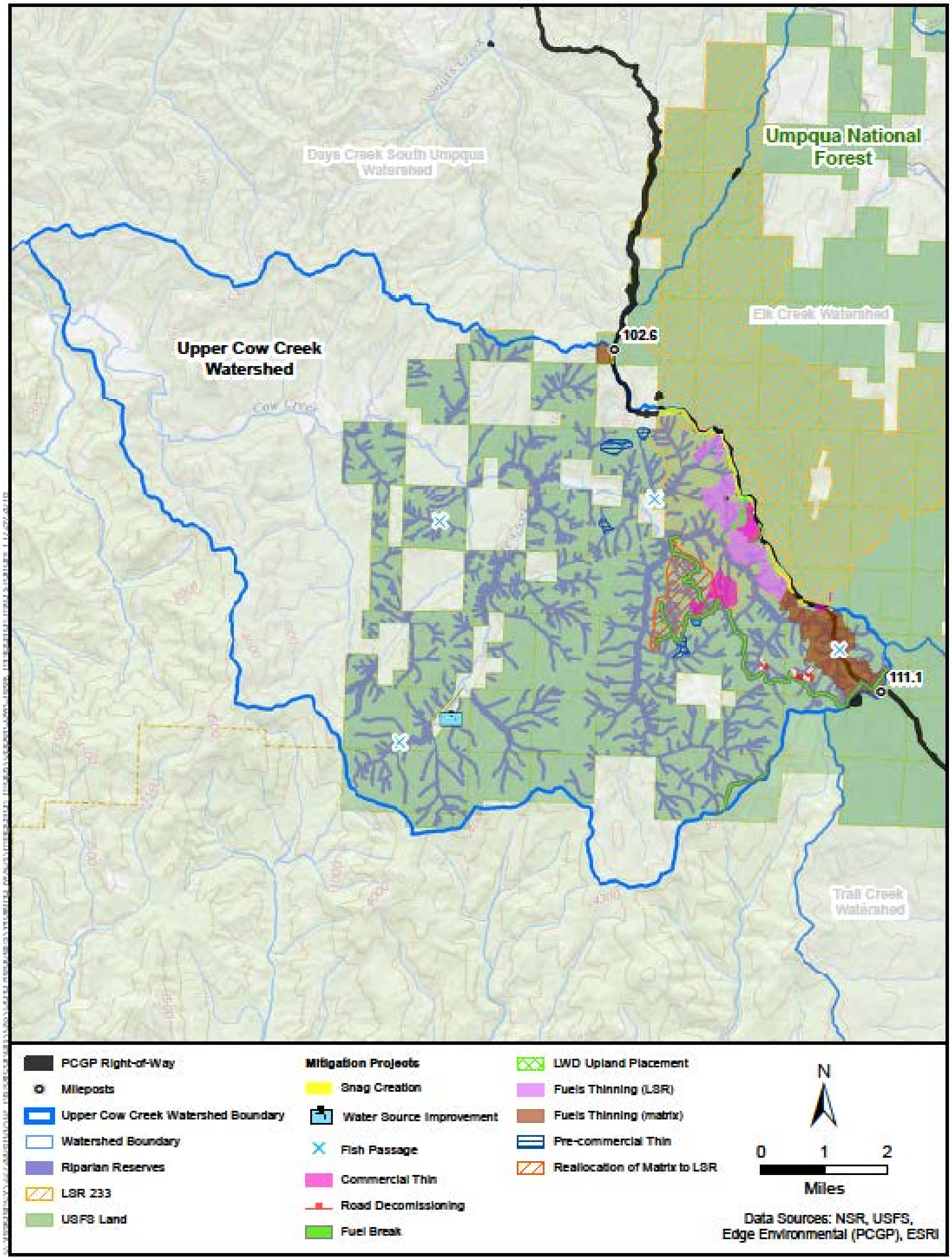


Figure 2.1-4. Map of CMP Projects in the Trail Creek Watershed on the Umpqua NF

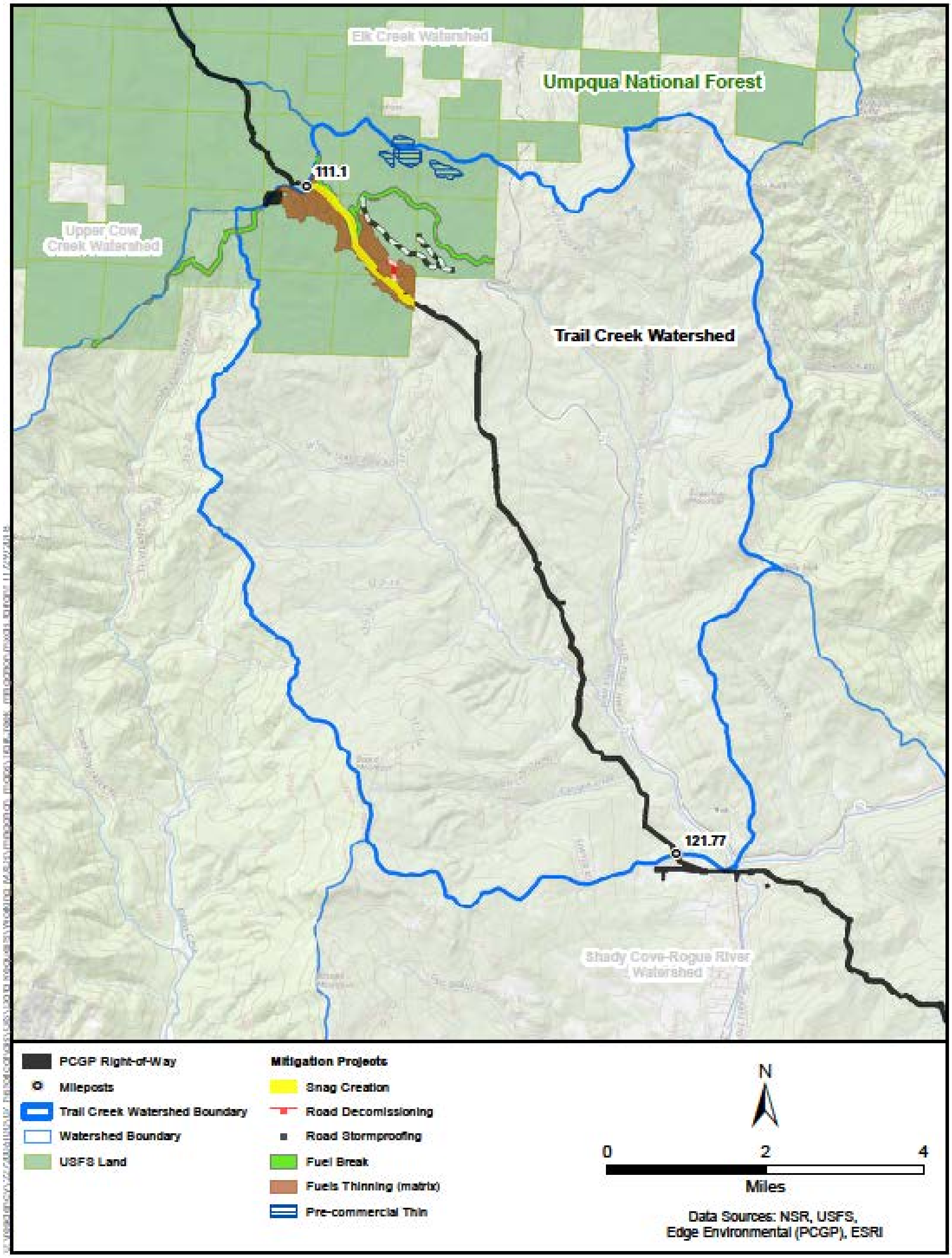


TABLE 2.1.1-3

Evaluation of Umpqua NF Mitigation Projects by Mitigation Group and Project Type

Mitigation Group	Project Type	Amount	Rationale	Environmental Consequences
Aquatic and Riparian Habitat	Fish Passage	11 Sites	Old culverts may block fish passage either by poor design or by failure over time. Removing these blockages and replacing them with fish-friendly designs can allow fish and other aquatic organisms to access previously unavailable habitat. This is responsive to ACS Objectives 1, 2, 3, and 9 (see appendix F4).	Short-term adverse effects: Removing old culverts and restoring stream/road crossings would result in short-term adverse effects since it involves the use of heavy equipment in and around the stream channel. The work would be done during low summer flow periods to minimize impacts to aquatic species and PDFs would be designed to minimize disturbance for Northern Spotted Owl (NSO). Long-term beneficial effects: Stream crossing replacement would directly improve stream connectivity and habitat for aquatic species by immediately restoring access to formerly inaccessible habitats. Indirectly, these projects would reduce potential sediment levels in the long term by decreasing the potential for road failure. Stream crossing projects also reduce stream velocities by increasing stream crossing sizes, eliminating flow restrictions and allowing passage to additional reaches of habitat by removing barriers to aquatic species which improves access to spawning and rearing habitat and allows unrestricted movement throughout stream reaches during seasonal changes in water levels (Hoffman 2007).
Road Sediment Reduction	Road Closure Road Decommissioning Road Stormproofing	1.2 Miles 7.2 Miles 11.4 Miles	Road closure reduces fine grained sediments by eliminating traffic impacts. Decommissioning roads can substantially reduce sediment delivery to streams (Madej 2000; Keppeler et al. 2007). Proposed road decommissioning would increase infiltration of precipitation, reduce surface runoff, and reduce sediment production from road-related surface erosion in the watershed where the impacts from the Project occur. Storm-proofing reduces sediment from roads by increasing the resistance of a road to failure during high intensity rainfall events. Storm-proofing strategies include improving drainage, reducing diversion potential at culverts, out-sloping road surfaces, and replacing culverts with hardened low water fords.	Short-term adverse effects: Road decommissioning methods generally include actions utilizing mechanized construction equipment to physically stabilize the road prism, restore natural drainage patterns, and allow for revegetation of the roadbed. Mechanized construction equipment might include excavators, backhoes and truck mounted loaders. Road closure is a method of preventing access to a road so that regular maintenance is no longer needed and future erosion is largely prevented by restoring drainage patterns if necessary and eliminating road traffic. Road decommissioning has the potential to cause short-term degradation of water quality by increasing sediment delivery to streams as roads are de-compacted by heavy equipment, culverts and cross drains are removed, and other restoration activities are implemented. The use of heavy mechanized equipment near streams could disturb the stream influence zone, deliver sediment, create turbidity, and cause stream bank erosion. There is also the potential of an accidental fuel/oil spill. These projects may cause a short-term degradation of water quality due to sediment input and chemical contamination. Stream bank condition and habitat substrate may also be adversely affected in the short term. However with careful project design and seasonal timing, these affects are expected to be of a limited extent and duration. Road decommissioning would create noise from heavy equipment that could disturb NSO. The potential for disturbance is mainly associated with breeding behavior at active nest sites. The PDFs would focus disturbance outside the critical nesting period and beyond critical distances for both NSO. These PDFs would reduce impacts from noise to acceptable levels. Long-term beneficial effects: Proposed road decommissioning and stormproofing would increase infiltration of precipitation, reduce surface runoff, and reduce sediment production from road-related surface erosion in the watershed where the impacts from the Project would occur. Decommissioning roads would restore natural drainage patterns and thereby avoid large volumes of added sediment to the stream network that would be likely to eventually occur. In addition limited road maintenance dollars could be focused on the remaining road systems resulting in more maintenance of culverts and ditchlines resulting in less potential for catastrophic failure. Madej (2000) concluded that by eliminating the risk of stream diversions and culvert failures, road removal treatments significantly reduce long-term sediment production from retired logging roads.
Fire Suppression	Water Source Improvement	3 Sites	The pipeline project would create fire suppression complexity by creation of a continuous corridor of early seral plant communities. High intensity stand-replacement fire has been identified as the single largest factor causing the loss of LSOG forests in the first	Short-term adverse effects: By employing appropriate BMPs and PDFs, the risk of erosion, sediment delivery, and detrimental soil damage within the treatment areas is expected to be minimal and within LMP standards and guidelines. Long-term beneficial effects: Pump chance developments provide readily available water sources

TABLE 2.1.1-3

Evaluation of Umpqua NF Mitigation Projects by Mitigation Group and Project Type

Mitigation Group	Project Type	Amount	Rationale	Environmental Consequences
			15 years of implementation of the Northwest Forest Plan (NWFP; Moeur et al. 2011). Pump chance developments and helicopter dipping ponds provide readily available water sources to support fire suppression efforts.	to support fire suppression efforts. These projects would help to reduce the threat of losing late-successional habitat to stand-replacement fire.
Stand Density Fuel Break	Fuels Reduction Road Shaded Fuel Break	2,489 Acres 616 acres	High intensity fire has been identified as the single factor most impacting late successional and old growth forest habitats on federal lands in the area of the NWFP. Construction of the pipeline and associated activities removes both mature and developing stands and will increase fire suppression complexity, however the corridor also provides a fuel break. Fuels reduction adjacent to the corridor will increase the effectiveness of the corridor as a fuel break. Density management will increase longevity of existing mature stands by reducing losses from disease, insects and fire. Stand density management and fuels reduction will lower the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire.	<u>Short-term adverse effects:</u> Stand density management and fuels reduction activities include the use of heavy equipment for cutting, skidding, slash piling, and hauling forest vegetation. Soil erosion risk would increase with the proposed activities because bare soil would be exposed during implementation. As the amount of bare/compacted soil increases, so does the risk of soil movement. Impacts caused by heavy equipment would increase the amount of detrimental soil damage within the treatment areas. By maintaining proper amounts of protective groundcover along with appropriate BMPs and PDFs, the risk of erosion, sediment delivery, and detrimental soil damage within the treatment areas is expected to be minimal and within LMP standards and guidelines. Stand density fuels reduction treatments would not be expected to adversely affect nesting habitat for the NSO since the treatments would not remove constituent elements of their nesting habitat. The proposed treatments could temporarily impact acres of dispersal habitat. This habitat would be impacted by reduction of canopy cover as well as the loss of some down wood, shrubs and snags, which provide habitat for prey species. Integrated stand density treatments would create noise from heavy equipment that could disturb the NSO. The potential for disturbance is mainly associated with breeding behavior at active nest sites. The PDFs would focus disturbance outside the critical nesting period and beyond critical distances for NSO. These PDFs would reduce impacts from noise to acceptable levels. <u>Long-term beneficial effects:</u> By creating less dense stands with less tree competition, residual trees would benefit from the increased availability of sunlight, nutrients, and water. With the increase of available nutrients, trees should be more vigorous and less susceptible to large scale insect/disease outbreaks. The proposed treatments would move the vegetation towards conditions that would have occurred under a natural disturbance regime. This would lower flame lengths, reduce fire spread and lower the probability of tree mortality in the event of a wildfire, leading to more successful suppression efforts. Aerial delivered retardant or water would be more effective in lighter fuels and a more open canopy, making it safer for firefighters to successfully anchor and contain wildfires. These actions would reduce the threat of losing late-successional habitat to fire.
Stand Density Management	Pre-commercial Thinning LSR Commercial Thin LSR Off-site Pine Removal	228 Acres 288 Acres 300 Acres	Pacific Connector pipeline will cause direct impacts to existing interior, developing interior habitat. The project will result in additional fragmentation and preclude the recovery of fragmented habitat for those stands adjacent to the pipeline corridor. Both mature stands and developing stands will be removed during pipeline construction. Density management of forested stands will assist in the recovery of late-seral habitat, impact from fragmentation, reduction in edge effects and enhance resilience of mature stands. Accelerating development of mature forest characteristics will shorten the impacts of those biological services loss due to pipeline construction. Stand density management is intended to enhance LSOG habitat by increasing the growth, health, and vigor of the trees remaining in the stands; restoring stand density, species diversity, and structural diversity	<u>Short-term adverse effects:</u> Stand density management activities include the use of heavy equipment for cutting, skidding, slash piling, and hauling forest vegetation. Soil erosion risk would increase with the proposed activities because bare soil would be exposed during implementation. As the amount of bare/compacted soil increases, so does the risk of soil movement. Impacts caused by heavy equipment would increase the amount of detrimental soil damage within the treatment areas. By maintaining proper amounts of protective groundcover along with appropriate BMPs and PDFs, the risk of erosion, sediment delivery, and detrimental soil damage within the treatment areas is expected to be minimal and within LMP standards and guidelines. Stand treatments would not be expected to adversely affect nesting habitat for the NSO since the treatments would not remove constituent elements of their nesting habitat. The proposed treatments could temporarily impact acres of dispersal habitat. This habitat would be impacted by reduction of canopy cover as well as the loss of some down wood, shrubs and snags, which provide habitat for prey species. Integrated stand density treatments would create noise from heavy equipment that could disturb the NSO. The potential for disturbance is mainly associated

TABLE 2.1.1-3

Evaluation of Umpqua NF Mitigation Projects by Mitigation Group and Project Type

Mitigation Group	Project Type	Amount	Rationale	Environmental Consequences
			to those considered characteristic under a natural disturbance regime. Thinning of young stands is a recognized treatment within LSR if designed to accelerate development of late-successional habitat characteristics.	with breeding behavior at active nest sites. The PDFs would focus disturbance outside the critical nesting period and beyond critical distances for NSO. These PDFs would reduce impacts from noise to acceptable levels. Long-term beneficial effects: By creating less dense stands with less tree competition, residual trees would benefit from the increased availability of sunlight, nutrients, and water. With the increase of available nutrients, trees should be more vigorous and less susceptible to large scale insect/disease outbreaks. The proposed treatments would enhance LSOG habitat by increasing the growth, health, and vigor of the trees remaining in the stands; restoring stand density, species diversity, and structural diversity to those considered characteristic under a natural disturbance regime.
Terrestrial Habitat Improvement	LWD Upland Placement LSR	164 Acres	The objective is to mitigate for the loss of recruitment of large down wood to adjacent stands and within the construction clearing zone. The project will forgo the development of large down wood for the life of the project and for decades after. Downed wood is a critical component of mature forest ecosystems. Large wood replacement will partially mitigate for the barrier effect of the corridor by creating structure across the corridor for use by small wildlife species. Placement in wood deficient areas adjacent to the corridor allows for scattering of stockpiled wood, reducing localized fuel loads while improving habitat in deficient stands. Larger logs maintain moisture longer and are less likely to be fully consumed by fire. Managing for the proposed levels provide for a greater assurance of species abundance.	Short-term adverse effects: Placement of LWD within and adjacent to the pipeline corridor would typically be done with heavy equipment that would drag the material into place. Heavy equipment use would increase the amount of detrimental soil damage within the treatment areas. By maintaining proper amounts of protective groundcover along with appropriate BMPs and PDFs, the risk of erosion, sediment delivery, and detrimental soil damage within the treatment areas is expected to be minimal and within LMP standards and guidelines. LWD placement would create noise from heavy equipment that could disturb the NSO. The potential for disturbance is mainly associated with breeding behavior at active nest sites. The PDFs would focus disturbance outside the critical nesting period and beyond critical distances for NSO. These PDFs would reduce impacts from noise to acceptable levels. Long-term beneficial effects: Beneficial effects include improving habitat for late-successional and other species and providing for long-term soil productivity.
Terrestrial Habitat Improvement	Snag Creation	324 Acres	Objective is to mitigate immediate and future impacts to snag habitat from the clearing of the pipeline right-of-way. The project prevents development of large snags during the life of the project and for decades after. Corridor construction will result in loss of snag habitat. As snags are a critical component of spotted owl habitat, replacement is needed. Replacement would be immediate though there would be a 10 year delay as snag decay develops.	Short-term adverse effects: Snag creation typically employs the use of chainsaws or inoculum to kill live trees. As such there is little if any ground disturbance and only minimal noise disturbance. The potential for noise disturbance is mainly associated with breeding behavior at active NSO nest sites. The PDFs would focus disturbance outside the critical nesting period and beyond critical distances for NSO. These PDFs would reduce impacts from noise to acceptable levels. Any adverse environmental impacts would be de minimus and very short term. Long-term beneficial effects: Beneficial impacts include the improvement of habitat for snag dependent species and in particular those species dependent on LSOG forests. Long-term benefits would also accrue as the created snags decay over time and eventually provide for LWD on the forest floor improving habitat for many other species and contributing to long-term soil productivity.
Terrestrial Habitat Improvement	Noxious Weed Treatments	6.7 Miles	The construction and operation of the pipeline project has the potential to create vectors for noxious weeds. These treatments are intended to reduce populations of noxious weeds that are in close proximity to the pipeline project right-of-way, as well as restore meadow habitats in the fifth-field watersheds that are currently impacted by noxious weeds	Short-term adverse effects: Treatments typically involve the cutting, pulling or spraying of noxious weeds. Since the work is typically done by hand there is minimal if any ground or noise disturbance. All activities would be conducted consistent with the most recent direction and plans for weed management and integrated vegetation management on BLM and Forest Service lands to minimize adverse impacts to plant and animal communities as well as water quality and aquatic habitats. Long-term beneficial effects: Long-term benefits would include the restoring of native plant populations and species diversity. Restoring native plant communities and increasing vegetation diversity generally contributes to restoring habitat for a broad group of plant and animal species.

TABLE 2.1.1-3

Evaluation of Umpqua NF Mitigation Projects by Mitigation Group and Project Type

Mitigation Group	Project Type	Amount	Rationale	Environmental Consequences
Terrestrial Habitat Improvement	Lupine Meadow Restoration	124 Acres	The Objective is to mitigate impacts to Unique habitats affected by the project. There will be loss of forest habitat buffering the unique habitats and disruption to soil horizons enhancing the opportunities for non -native plant species. These impacts cannot be fully mitigated on site; therefore, restoration activities such as burning, removal of encroaching conifers, and noxious weed control would be applied to a meadow located in LSR 223.	Short-term adverse effects: Treatments typically involve the cutting, pulling or spraying of noxious weeds and control burning. Since the work is typically done by hand there is minimal if any ground or noise disturbance. All activities would be conducted consistent with the most recent direction and plans for weed management and smoke management on Forest Service lands to minimize adverse impacts to plant and animal communities as well as water quality and aquatic habitats. Long-term beneficial effects: Long-term benefits would include the restoring of native plant populations and species diversity. Restoring native plant communities and increasing vegetation diversity generally contributes to restoring habitat for a broad group of plant and animal species.
Reallocation of Matrix Lands to LSR	Reallocation of Matrix to LSR	585 Acres	This mitigation group contributes to the "neutral to beneficial" standard for new developments in LSRs by adding acres to the LSR land allocation to offset the long-term loss of habitat due to the construction and operation of the pipeline project. It compensates for the removal of suitable nesting, roosting, and foraging NSO habitat by adding additional LSOG acres to the LSR land allocation. Reallocation of matrix lands to LSR also contributes to ACS objectives and may benefit Survey and Manage species by providing additional habitat that is managed to create LSOG stand conditions over time.	Short-term adverse effects: The reallocation of matrix lands to LSR is an administrative action that would not have any immediate environmental consequences on the ground. Long-term beneficial effects: The proposed reallocation would change the management direction of approximately 585 acres from one of multiple uses with an emphasis on timber management to a management emphasis focusing on the creation and maintenance of late-successional forest habitat. Over time, this reallocation would benefit species dependent on late-successional forests through management actions that would be designed to improve or maintain late-successional habitat conditions.

TABLE 2.1.1-4

Comparison of Total Acres of Project-Specific Amendments and Compensatory Mitigation on the Umpqua NF

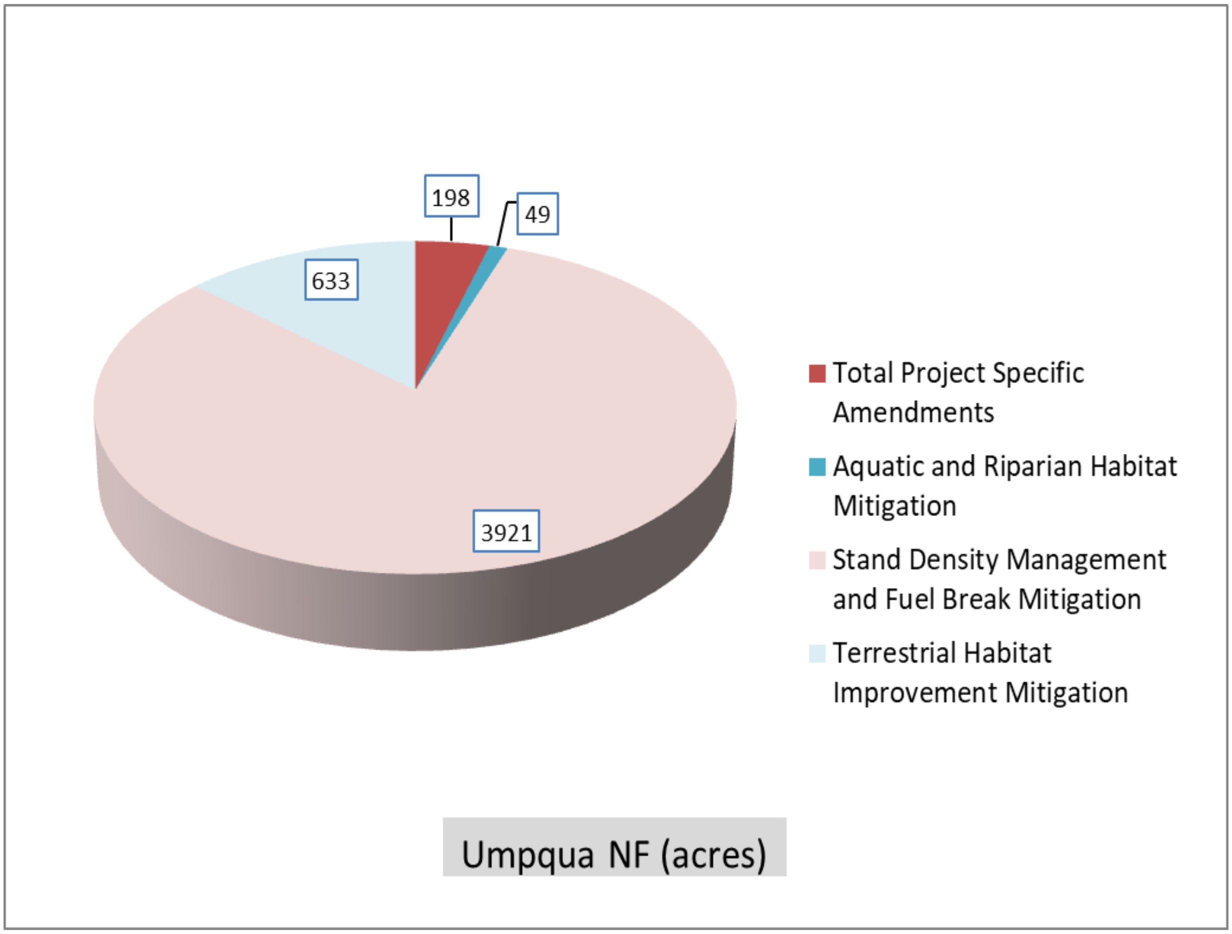
Amendments and Compensatory Mitigation	Acres
Total Project Specific Amendments[1]	198
Aquatic and Riparian Habitat Mitigation[2]	49
Stand Density Management and Fuel Break Mitigation	3921
Terrestrial Habitat Improvement Mitigation	633

Data Source: USFS GIS Data Layers

1) Includes amendments FS-1, UNF-1, and UNF-3

2) Includes road sediment reduction actions and assumes a 20 foot wide treatment area

Figure 2.1-5. Comparison of Total Acres of Proposed Project Specific Amendments and Compensatory Mitigation on the Umpqua NF



2.2 ROGUE RIVER NF

There are six proposed forest plan amendments for the Pacific Connector pipeline project on the Rogue River NF. An evaluation of how the proposed amendments relate to the planning requirements in 36 CFR 219.8 – 219.11 is discussed in section 2.2.1 below. These proposed amendments are summarized in table 2.2.1-1 along with the project impacts and related project design features (PDF) and compensatory mitigation. The proposed CMP projects are listed in table 2.2.1-2 and evaluated in table 2.2.1-3, table 2.2.1-4, and figure 2.2-2 below. A map of the proposed CMP projects by watershed is displayed in figure 2.2-1.

2.2.1 Evaluation of Rogue River NF Proposed Forest Plan Amendments

The proposed Pacific Connector pipeline incorporates the most up-to-date engineering and technological practices for pipeline construction and operation. However, even with following these practices, it has been determined that one Forest Plan standard associated with rare and/or isolated species (Survey and Manage), two Forest Plan standards associated with the soil, water, and riparian resources, and three Forest Plan standards associated with visual resources[6] would need to be modified so that the proposed construction and operation of the Pacific Connector pipeline can be in compliance with the Rogue River NF LRMP as amended by the NWFP and the January 2001 Survey and Manage ROD.

2.2.1.1 Forest Plan Amendments Related to Rare Aquatic and Terrestrial Plant and Animal Communities (FS-1, RRNF-7):

*Amendment FS-1**:** Project-Specific Amendment to Exempt Management Recommendations for Survey and Manage Species on the Rogue River NF.*

One Forest Plan standard associated with rare and/or isolated species (Survey and Manage) would need to be modified so that the proposed construction and operation of the Pacific Connector pipeline can be in compliance with the Rogue River NF LRMP as amended by the NWFP and the January 2001 Survey and Manage ROD. This standard is:

- Management Direction: Manage All Known Sites (Survey and Manage ROD, Standards and Guidelines Page 8). Current and future known sites will be managed according to the Management Recommendation for the species. Professional judgment, Appendix J2 in the Northwest Forest Plan Final SEIS, and appropriate literature will be used to guide individual site management for those species that do not have Management Recommendations.

The proposed amendment to this standard is:

- Management Direction: Manage All Known Sites (Survey and Manage ROD, Standards and Guidelines Page 8). Current and future known sites will be managed according to the Management Recommendation for the species, **with the exception of the operational right-of-way and the construction zone for the Pacific Connector Pipeline, for which the applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented.** Professional judgment, Appendix

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[6] In the DEIS there was a fourth amendment for visual resources (RRNF-3) that addressed visual guidelines for the Pacific Crest Trail. The new crossing of the Pacific Crest Trail on an existing road has eliminated the need for this amendment (see section 3.4.2.9 of the FEIS).

> J2 in the Northwest Forest Plan Final SEIS, and appropriate literature will be used to guide individual site management for those species that do not have Management Recommendations. (Proposed amendment FS-1 on the Rogue River NF)

While the amendment would provide an exception to meeting this standard, there would also be requirements to do what is appropriate, applicable and feasible to minimize, maintain or restore any effects of the pipeline's construction and operation on Survey and Manage species within the area affected by the pipeline. Consequently, each amended standard includes the requirement that the "applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented".

The purpose of this project-level amendment is to make the proposed Pacific Connector pipeline project consistent with the Rogue River NF LRMP. Thus, the substantive planning rule requirements that are directly related to this amendment are:

- 36 CFR 219.9(a)(2)(ii) – [the plan must include plan components to maintain or restore] "Rare aquatic and terrestrial plant and animal communities."
- 36 CFR 219.9(b)(1) – "The responsible official shall determine whether or not the plan components required by paragraph (a) provide ecological conditions necessary to: …maintain viable populations of each species of conservation concern within the plan area."

Because the proposed amendment is "directly related" to these two substantive requirements, the Responsible Official must apply the requirements within the scope and scale of the proposed amendment (36 CFR 219.13 (b)(5)).

In considering the "scope and scale" of the amendment, it is important to recognize that the applicable sections of 36 CFR 219.9(a) and (b) that are described above, requires plan components to maintain or restore rare aquatic and terrestrial plant and animal communities, across the entire planning area (i.e., the Rogue River NF). This plan amendment does not alter these LRMP plan requirements for managing rare plant and animal communities across 99.95% of the Rogue River NF. The proposed pipeline construction corridor including the temporary extra work areas (TEWAs) and the uncleared storage areas (UCSAs) is approximately 281 acres of the 628,443 acre Rogue River NF. Within this 281 acre construction corridor surveys have identified 90 Survey and Manage sites that could be potentially impacted by construction activities. The proposed amendment does not waive the persistence objective for Survey and Manage species. The analysis that was conducted (see section 4.6.4.3 of the FEIS and Appendix F.5) determined the Survey and Manage persistence objectives would be met. This means that for Rogue River NF lands within the project area, individual sites of Survey and Manage species may be impacted or lost to construction activities, but affected species are expected to persist within the range of the NSO despite the loss of these individual sites.

The amendment modifies this standard so that in the 281 acres of the project construction area the project need not be in compliance with this standard' specific requirements but instead, it is the "applicable mitigation measures identified in the POD and the Pacific Connector Project design requirements" that must be implemented. Or stated in another way, for the 281 acres of National Forest lands that would be within the operational right-of-way and construction zone for the Pacific Connector Pipeline, the management requirement described above would be replaced with the full set of management requirements that comprise the "applicable mitigation measures identified in the POD and Pacific Connector Project Design requirements". The inclusion of these management requirements as a part of the plan component language for the LRMP in this plan amendment, addresses the applicable 36 CFR 219.9(a) and (b) rule requirements within the "scope and scale" of the proposed plan amendments. The sections below describe in more detail how the applicable 36 CFR 219.9(a) and (b) requirements are being addressed.

How the Required Mitigation Measures would Maintain or Restore Effects to Rare Aquatic and Terrestrial Plant and Animal Communities and Meet the Applicable 36 CFR 219.9(a) and 36 CFR 219.9 (b) Requirements

The Forest Service has worked to inventory, analyze, and evaluate rare aquatic, terrestrial plant and animal communities that could be affected by this project. In addition, a third-party consultant for technical support was also utilized in reviewing the information gathered for the project. The POD is a document developed between the FS, BLM, FERC, and PCGP that contains the design features, mitigation measures, roles and responsibilities, monitoring, and procedures for the construction and operation of the pipeline on NFS lands. In addition, FERC's applicant prepared Plan and Procedures for construction and restoration enforceable, where applicable, for additional design features and mitigation. The design requirements and mitigation measures of the POD would be required by the modified standards and incorporated into BLM's ROW grant.

The mitigation measures incorporated into amendments for Survey and Manage species are designed to minimize, maintain or restore the potential for habitat fragmentation, edge effects, and loss of long-term habitats associated with effected species. To ensure adequate restoration and revegetation of the ROW, design features are identified in the *Erosion Control and Revegetation Plan* (POD I), *Right-of-Way Clearing Plan* (POD U), *Leave Tree Protection Plan* (POD P). In addition, routing considerations were identified during project development to ensure avoidance of known populations of rare plant and animal communities (See Chapter 3.4.2, FEIS). As well as, Appendix F.5, *Survey and Manage Persistence Evaluations*, and proposed amendment RRNF-7 Reallocation of Matrix Lands to LSR.

As a basis for Survey and Manage determinations, Appendix F.5 provides background research on Survey and Manage species that could be affected by the PCGP Project; a review of survey reports prepared by others for the PCGP Project; and processing and analysis of spatial data obtained from the Bureau of Land Management (BLM), Forest Service, and other sources over the past 12 years. Background information was used in combination with new information available as a result of surveys for the PCGP Project and recent surveys in other portions of old growth forests to discuss the currently known distribution of the species in old growth forests within the NSO range. Impacts to sites as a result of the PCGP Project were analyzed to determine if the species would continue to have a reasonable assurance of persistence in the NSO range following implementation of the PCGP Project, taking into consideration the status and distribution of the species and general habitat in the NSO range.

Some of the required mitigation measures in the POD sections to protect rare plant and animal communities include: flagging existing snags on the edges of the construction right-of-way or TEWAs where feasible to save from clearing; snags would be saved as and used in LWD placement post-construction to benefit primary and secondary cavity nesting birds, mammals, reptiles, and amphibians; other large diameter trees on the edges of the construction right-of-way and TEWAs would also be flagged to save/protect as green recruitment or habitat/shade trees, where feasible; trees would be girdled to create snags to augment the number of snags along the right-of-way to benefit cavity nesting birds, mammals, reptiles, and amphibians. See POD's P & U and section 2.6.3 -- Monitoring by Land Managing Agencies on Federal Lands of the FEIS for a complete list of applicable mitigation measures for pipeline construction. Additional measures include low ground weight (pressure) vehicles would be used; logging machinery would be restricted to the 30-foot permanent right-of-way wherever possible to prevent soil compaction; the removal of soil duff layers would be avoided in order to maintain a cushion between the soil and the logs and the logging equipment; designed skid trails would be used to restrict detrimental soil disturbance (compaction and displacement) to a smaller area of the right-of-way over the pipeline trenching area; and the temporary construction area would be restored and revegetated using native seeds, to the extent possible, and saplings (POD I).

In an effort to minimize, maintain or restore the impacts to Survey and Manage species, PCGP adopted route variations to avoid certain species identified in the Survey and Manage Persistence Evaluations by co-locating the proposed construction corridor adjacent to existing roads, through managed timber stands or otherwise avoid unique LSOG habitats to the maximum extent practicable (See Chapter 3.4.2, FEIS).

During construction of the Project, Compliance Monitors representing FERC are present on a full-time basis to inspect construction procedures and mitigation measures and provide regular feedback on compliance issues to FERC and the Forest Service. Objectives of the Compliance Monitoring program are to facilitate the timely resolution of compliance issues in the field; provide continuous information to FERC regarding noncompliance issues and their resolution; and review, process, and track construction-related variance requests. Changes to previously approved mitigation measures, construction procedures, and construction work areas due to unforeseen or unavoidable site conditions would require various levels of regulatory approval from the applicable land management agencies. FERC would have the authority to stop any activity that violates an environmental condition of the FERC authorization issued to PCGP.

Additionally, environmental compliance oversight responsibilities for PCGP, FERC, FS and BLM are described in the POD (Environmental Briefings and Compliance Plan, POD G) that would apply to the construction, operation, and maintenance of the project specifically on NFS lands. The FS Authorized Officer would coordinate with the BLM in administering and enforcing ROW grant provisions and would have stop-work authority. The FS Authorized Officer's designated representatives would ensure that the stipulations and mitigation measures included in the POD that are designed to minimize, maintain or restore the effects to soil, water and riparian resources, are adhered to during project construction, operation, and maintenance. The BLM Authorized Officer would coordinate with the FS to ensure the work is being conducted in accordance with the ROW grant and agreed upon conditions. BLM and the FS would have stop-work authority. Field variance requests would be coordinated with the Authorized Officers.

Amendment RRNF-7: Reallocation of Matrix Lands to LSR

The other proposed Forest Plan amendment related to rare aquatic and terrestrial plant and animal communities on the Rogue River NF is RRNF-7. This proposed amendment would change the designation of approximately 522 acres from the Matrix land allocation to the LSR land allocation in Section 32, T.36S., R.4E. W.M., OR. (see figure 2.2-1). This change in land allocation is proposed as mitigation for the potential adverse impact of the Pacific Connector Pipeline project on LSR 227 on the Rogue River NF. This is a plan level amendment that would change future management direction for the lands reallocated from Matrix to LSR (for additional information on consistency with LSR Standards and Guidelines see section 4.7.3.6. and Appendix F.3 of the FEIS).

The purpose of this amendment is to make the proposed Pacific Connector pipeline project consistent with the Rogue River NF LRMP. Thus, the substantive planning rule requirements that are directly related to this amendment are:

- 36 CFR 219.8(a)(1)(i) – [the plan must include plan components to maintain or restore] “Interdependence of terrestrial and aquatic ecosystems in the plan area.”
- 36 CFR 219.8(b)(1) – [the plan must include plan components to guide the plan area’s contribution to social and economic sustainability] “Social, cultural and economic conditions relevant to the area influenced by the plan.”
- 36 CFR219.9(b)(1) “The responsible official shall determine whether or not the plan components required by paragraph (a) of this section provide the ecological conditions necessary to: contribute to the recovery of federally listed threatened and endangered species, conserve proposed and candidate species, and maintain a viable population of each species of conservation concern within the plan area,”
- 36 CFR 219.9(a)(2)(ii) – [the plan must include plan components to maintain or restore] “Rare aquatic and terrestrial plant and animal communities.”

Because the proposed amendment is “directly related” to these four substantive requirements, the Responsible Official must apply the requirements within the scope and scale of the proposed amendment (36 CFR 219.13 (b)(5)). However, because this proposed amendment would simply modify the area to which existing direction applies, the existing formatting for the planning requirements listed above would be retained (36 CFR 219.13(b)(4)).

In considering the “scope and scale” of the amendment, it is important to recognize that the applicable sections of 36 CFR 219.8 and 219.9 that are described above, requires plan components to maintain or restore rare aquatic and terrestrial plant and animal communities, and provide for social and economic sustainability across the entire planning area (i.e., the Rogue River NF). This plan amendment does not alter these LRMP plan requirements across 99.92% of the Rogue River NF. The proposed land reallocation is approximately 522 acres of the 628,443 acre Rogue River NF. The proposed amendment would benefit rare aquatic and terrestrial plant and animal communities by placing these acres in a late successional reserve where providing habitat for these species is the primary goal.

The timber probable sale quantity (directly related to economic conditions) would not be affected before the Rogue River NF LRMP is revised because the Forest has the capacity to maintain probable sale quantity without the acres of matrix lands that would be reallocated to LSR. If a linear relationship between acres and outputs is assumed, the potential effect would be less than one-half of one percent of the Forest's probable sale quantity since this proposed amendment would affect less than one-half of one percent of the Forest's matrix land base. This proposed amendment would not prevent future vegetation management activities such as thinning that would benefit LSR habitat and could also contribute to the local forest products industry.

How the Compensatory Mitigation Actions would help to Maintain or Restore Rare Aquatic and Terrestrial Plant and Animal Communities in the Plan Area (36 CFR 219.9(a), 36 CFR 219.9 (b)).

In addition to the reallocation of 522 acres of Matrix to LSR, the CMP on the Rogue River NF includes proposals for stand density management on 618 acres, terrestrial habitat improvements on 1153 acres and decommissioning approximately 57.5 miles of roads that would benefit rare plant and animal communities. The CMP on the Rogue River NF also includes proposals to improve aquatic and riparian habitat that would benefit rare aquatic plant and animal communities (see the discussion of *How the Compensatory Mitigation Actions would help to Maintain or Restore the Ecological Integrity of Riparian Areas, Soils, and Soil productivity in the Plan Area (36 CFR 219.8(a)(3)(i), (36 CFR 219.8(a)(2)(ii))* below for a discussion of benefits to aquatic habitats).

Stand density management would enhance LSOG habitat by increasing the growth, health, and vigor of the trees remaining in the stands, and restoring species and structural diversity to those considered characteristic under a natural disturbance regime. Thinning of young stands is a recognized treatment within LSR if designed to accelerate development of late-successional habitat characteristics. The proposed treatments include 618 acres of pre-commercial thinning. The Pacific Connector pipeline would result in additional fragmentation and preclude the recovery of fragmented habitat for those stands adjacent to the pipeline corridor. Both mature stands and developing stands would be removed during pipeline construction. Density management of forested stands would assist in the recovery of late-seral habitat, impact from fragmentation, reduction in edge effects and enhance resilience of mature stands over time. Accelerating development of mature forest characteristics would shorten the impacts of those biological services loss due to pipeline construction.

Terrestrial habitat improvements include proposals for large woody debris placement on 511 acres, snag creation on 622 acres, and 20 acres of habitat planting for the Mardon Skipper butterfly. Large wood replacement would partially mitigate for the barrier effect of the corridor by creating structure across the corridor for use by small wildlife species. Placement in wood deficient areas adjacent to the corridor allows for scattering of stockpiled wood, reducing localized fuel loads while improving habitat in deficient stands. Larger logs maintain moisture longer and are less likely to be fully consumed by fire. Managing for the proposed levels provide for a greater assurance of species abundance. The objective of snag creation is to mitigate for the immediate and future impacts to snag habitat from the clearing of the pipeline right-of-way. The Dead Indian Plateau region is one of four known sites for Mardon Skipper butterflies in the world. It is also adjacent to a known site for Short-horned grasshoppers. Both of these species are on the Regional Forester's Sensitive Species list. As a long-term opening, the pipeline corridor would provide a unique opportunity to develop habitat for these two species. Planting the corridor with plants preferred by these species has the potential to increase the habitat and local range for both species. This action would provide both short-term and long-term habitat for the local population of Mardon Skipper butterflies and Short-horned grasshoppers.

Although the Pacific Connector project has been routed to avoid LSOG habitat as much as possible, the project would cause habitat fragmentation within LSR 227. Road decommissioning reduces the edge effects over time by revegetating road surfaces and eliminating road corridors. Revegetating selected roads in conjunction with the density management proposed for adjacent plantations would create larger blocks of late successional habitat in the future.

These projects have been designed by an interdisciplinary team of resource professionals on the Rogue River NF with input and coordination with the U.S. Fish and Wildlife Service, NOAA Fisheries, and State agencies. They were planned within the watersheds that would be affected by the Pacific Connector pipeline project. They are a component of the PCGP application and would be a requirement of the Right-of-Way grant. Overall, these projects would help maintain and restore rare aquatic and terrestrial plant and animal communities on the Rogue River NF (see tables 2.2.1-3 and 2.2.1-4 and figures 2.2-1 and 2.2-2 for additional information).

2.2.1.2 Forest Plan Amendments Related to Soil, Water and Riparian Areas (RRNF -5, RRNF-6):

Two Forest Plan standards associated with the soil, water, and riparian resources would need to be modified so that the proposed construction and operation of the Pacific Connector pipeline can be in compliance with the Rogue River NF LRMP. These standards are:

- Management Prescription 26 Restricted Riparian Standard & Guidelines for Facilities (10), (RRNF LRMP 4-308). Helispots and transmission corridors should be located outside this management area.
- Standard & Guideline for Soils (3) (RRNF LRMP 4-41, 4-83, 4-97, 4-123, 4-177, 4-307). No more than 10 percent of an activity area should be compacted, puddled or displaced upon completion of project (not including permanent roads or landings). No more than 20 percent of the area should be displaced or compacted under circumstances resulting from previous management practices, including roads and landings. Permanent recreation facilities or other permanent facilities are exempt.

The proposed amendments to these standards are:

- Management Prescription 26 Restricted Riparian Standard & Guidelines for Facilities (10), (RRNF LRMP 4-308). Helispots and transmission corridors should be located outside this management area, **with the exception of the operational right-of-way and the construction zone for the Pacific Connector Pipeline, for which the applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented**. (Proposed amendment RRNF-5)
- Standard & Guideline for Soils (3) (RRNF LRMP 4-41, 4-83, 4-97, 4-123, 4-177, 4-307). No more than 10 percent of an activity area should be compacted, puddled or displaced upon completion of project (not including permanent roads or landings). No more than 20 percent of the area should be displaced or compacted under circumstances resulting from previous management practices, including roads and landings, **with the exception of the operational right-of-way and the construction zone for the Pacific Connector**

> **Pipeline, for which the applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented.** Permanent recreation facilities or other permanent facilities are exempt. (Proposed amendment RRNF-6)

While the amendments would provide an exception to meeting these standards, there would also be requirements to do what is appropriate, applicable and feasible to minimize, maintain or restore any effects of the pipeline's construction and operation on the soil, water and riparian resources within the area affected by the pipeline. Consequently, each amended standard includes the requirement that the "applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented".

The purpose of these two project-level amendments is to make the proposed Pacific Connector pipeline project consistent with the Rogue River NF LRMP. Thus, the substantive planning rule requirements that are directly related to these three amendments are:

- 36 CFR 219.8(a)(3)(i) – The plan must include plan components "to maintain or restore the ecological integrity of riparian areas in the plan area, including plan components to maintain or restore structure, function, composition, and connectivity
- 36 CFR 219.8(a)(2)(ii) – [The plan must include plan components to maintain or restore] "soils and soil productivity, including guidance to reduce soil erosion and sedimentation."

Because the two proposed amendments are "directly related" to these two substantive requirements, the Responsible Official must apply the requirements within the scope and scale of the proposed amendments (36 CFR 219.13 (b)(5)).

In considering the "scope and scale" of the two amendments, it is important to recognize that the applicable sections of 36 CFR 219.8(a) that are described above, requires plan components to "maintain or restore" the soil, water and riparian resources across the entire planning area (i.e., the Rogue River NF). These plan amendments do not alter these LRMP plan requirements for managing the soil, water, and riparian resources across 99.95% of the Rogue River NF. The proposed pipeline construction corridor including the TEWAs and the UCSAs is approximately 281 acres of the 628,443 acre Rogue River NF. Of the 281 acres of pipeline corridor construction it is estimated that approximately 2.5 of these acres would not meet the standards for riparian area management described above and approximately 62 to 144 acres would not meet standards for soils described above.

The amendments modify two standards so that in the 281 acres of the project construction area the project need not be in compliance with these standards' specific requirements but instead, it is the "applicable mitigation measures identified in the POD and the Pacific Connector Project design requirements" that must be implemented. Or stated in another way, for the 281 acres of National Forest lands that would be within the operational right-of-way and construction zone for the Pacific Connector Pipeline, the two management requirements described above would be replaced with the full set of management requirements that comprise the "applicable mitigation measures identified in the POD and Pacific Connector Project Design requirements". The inclusion of these management requirements as a part of the plan component language for the LRMP in this plan amendment, addresses the applicable 36 CFR 219.8(a) rule requirements within the “scope and scale” of these proposed plan amendments. The sections below describe in more detail how the applicable 36 CFR 219.8(a) requirements are being addressed.

How the Required Mitigation Measures would Maintain or Restore Effects to Soil, Water, and Riparian Resources and Meet the Applicable 36 CFR 219.8(a) Requirements.

The Forest Service has worked with Pacific Connector Gas Pipeline (PCGP) to inventory, analyze, and evaluate the geologic, soil, and hydrologic resources that could be affected by this project. In addition, a third-party consultant for technical support was also utilized in reviewing the information gathered for the project. The POD is a document developed between the FS, BLM, FERC, and PCGP that contains the design features, mitigation measures, roles and responsibilities, monitoring, and procedures for the construction and operation of the pipeline on NFS lands. In addition, FERC’s applicant prepared Plan and Procedures for construction and restoration are enforceable, where applicable, for additional design features and mitigation. The design requirements and mitigation measures of the POD would be required by the modified standards and incorporated into BLM’s ROW grant.

The mitigation measures, incorporated into amendments for soil, water, and riparian resources are designed to minimize, maintain or restore the potential for soil movement, slope stability, water quality, and to ensure adequate restoration and revegetation. These measures are identified in: the *Erosion Control and Revegetation Plan* (POD I); *Right-of-Way Clearing Plan* (POD U); *Wetland and Waterbody Crossing Plan* (POD BB); the *Forest Service Site Specific Stream Crossing Prescriptions* (NSR 2014); the *Stream Crossing Risk Analysis*; and *Stream Crossing Risk Analysis Addendum* (GeoEngineers2017d, 2018a). PCGP would also follow the FERC’s applicant prepared Wetland Procedures and the Best Management Practices for the State of Oregon. To further reduce potential for landslides on steep slopes, the Forest Service, BLM, and FERC are also recommending additional industry best management practices and measures identified from the *Technical Report on Soil Risk and Sensitivity Assessment* (NSR 2014) be incorporated into PCGP’s terms and conditions of the Right-of-Way Grant as described in the POD’s identified above. See 4.2.3.3 of the FEIS for a description of soil risk and sensitivity assessment.

Areas with soils rated moderate to very high for risk or sensitivity (17 acres total) would be recommended for more site-specific validation of the risk criteria used in the *Technical Report on Soil Risk and Sensitivity Assessment* (NSR 2014) to confirm that specific locations merit consideration of the more aggressive soil remediation measures, such as: a 2- to 3-inch organic mulch surface application (80 percent coverage) of woodchips, logging slash, and/or straw; adaptive seed mixes and vegetation to better fit site conditions; deep subsoil decompaction with hydraulic excavators that leave constructed corridor mounded and rough with maximum water infiltration so that water cannot flow downhill for any appreciable distance; more aggressive use of constructed surface water runoff dispersion structures such as closely placed and more pronounced slope dips and water bars, etc.; more aggressive use of constructed surface runoff entrapments such as silt fencing, sediment settling basins, or straw bale structures, etc.; more aggressive placement (100 percent coverage) and depth (3 to 4 inches) of ground cover using woodchips, logging slash, straw bales, wattles (see POD’s U and I). In efforts to protect soil productivity, topsoil segregation would be required for pipeline construction at wetland and waterbody crossings on NFS lands (POD U).

Some of the required mitigation measures in the POD BB and *Forest Service Site Specific Stream Crossing Prescriptions* (NSR 2014) to protect wetlands and minimize, maintain or restore compaction include: limiting the construction right-of-way width to 75 feet through wetlands; placing equipment on mats; using low-pressure ground equipment; limiting equipment operation and construction traffic along the right-of-way; locating temporary workspace (TEWAS) more than 50 feet away from wetland boundaries; cutting vegetation at ground level; limiting stump removal to the construction trench; segregating the top 12 inches of soil, or to the depth of the topsoil horizon; using "push-pull" techniques in saturated wetlands; limiting the amount of time that the trench is open by not trenching until the pipe is assembled and ready for installation; not using imported rock and soils for backfill; and not using fertilizer, lime, or mulch during restoration in wetlands. PCGP must also follow the FERC Waterbody and Wetland Construction and Mitigation Procedures. See 4.3.3.2 of the FEIS for a complete list of applicable mitigation measures for pipeline construction at specific waterbody and stream crossings.

In an effort to minimize, maintain or restore the impacts to streams and riparian areas, PCGP adopted route variations to co-locate the proposed construction corridor adjacent to existing roads and along dry ridge tops (See Chapter 3.4.2, FEIS). In addition, PCGP has committed to limit construction at waterbody crossings to times of dry weather or low water flow. PCGP would implement the required erosion control measures at the proposed stream crossings to minimize, maintain or restore potential erosion and sedimentation impacts. The applicable mitigation measures and monitoring requirements in the POD relating to water waterbody crossings are included in the *Site Specific Forest Service Stream Crossing Prescriptions, and Wetland and Waterbody Crossing Plan* (POD BB). In addition, applicable mitigation measures from the FERC approved applicant prepared Procedures for Wetland and Waterbody Crossings would be required.

During construction of the Project, Compliance Monitors representing FERC are present on a full-time basis to inspect construction procedures and mitigation measures and provide regular feedback on compliance issues to FERC and the Forest Service. Objectives of the Compliance Monitoring program are to: facilitate the timely resolution of compliance issues in the field; provide continuous information to FERC regarding noncompliance issues and their resolution; and review, process, and track construction-related variance requests. Changes to previously approved mitigation measures, construction procedures, and construction work areas due to unforeseen or unavoidable site conditions would require various levels of regulatory approval from the applicable land management agencies. FERC would have the authority to stop any activity that violates an environmental condition of the FERC authorization issued to PCGP.

Additionally, environmental compliance oversight responsibilities for PCGP, FERC, FS and BLM are described in the POD (Environmental Briefings and Compliance Plan, POD G) that would apply to the construction, operation, and maintenance of the project specifically on NFS lands. The FS Authorized Officer would coordinate with the BLM in administering and enforcing ROW grant provisions and would have stop-work authority. The FS Authorized Officer's designated representatives would ensure that the stipulations and mitigation measures included in the POD that are designed to minimize, maintain or restore the effects to soil, water and riparian resources, are adhered to during project construction, operation, and maintenance. The BLM Authorized Officer would coordinate with the FS to ensure the work is being conducted in accordance with the ROW grant and agreed upon conditions. BLM and the FS would have stop-work authority. Field variance requests would be coordinated with the Authorized Officers.

How the Compensatory Mitigation Actions would help to Maintain or Restore the Ecological Integrity of Riparian Areas, Soils, and Soil Productivity in the Plan Area (36 CFR 219.8(a)(3)(i), 36 CFR 219.8(a)(2)(ii)).

Part of the CMP on the Rogue River NF includes proposals to place large woody debris in-stream for 1.5 miles, repair stream crossings at 32 sites, and decommission approximately 57.5 miles of road.

Placement of LWD in streams adds structural complexity to aquatic systems by creating pools and riffles, trapping fine sediments and can contribute to reductions in stream temperatures over time (Tippery et al. 2010). Placing LWD in streams affects channel morphology, the routing and storage of water and sediment, and provides structure and complexity to stream systems. Complex pools and side channels created by instream wood provide overwintering habitat to stream salmonids and other aquatic organisms (Solazzi et. al. 2000). They also provide cover from predators during summer low flow periods when predation is at its highest. Providing more stream channel structure results in better over wintering habitat, improved summer pool habitat, and more abundant spawning gravels.

Restoring stream crossings reconnects aquatic habitats by allowing the passage of aquatic biota and restoring riparian vegetation. Stream crossing replacement would directly improve stream connectivity and habitat for aquatic species by immediately restoring access to formerly inaccessible habitats. Indirectly, these projects would reduce potential sediment levels in the long term by decreasing the potential for road failure. Stream crossing projects also reduce stream velocities by increasing stream crossing sizes, eliminating flow restrictions and allowing passage to additional reaches of habitat by removing barriers to aquatic species which improves access to spawning and rearing habitat and allows unrestricted movement throughout stream reaches during seasonal changes in water levels (Hoffman 2007).

Decommissioning roads can substantially reduce sediment delivery to streams (Madej 2000; Keppeler et al. 2007). Proposed road decommissioning and stormproofing would increase infiltration of precipitation, reduce surface runoff, and reduce sediment production from road-related surface erosion in the watershed where the impacts from the Project would occur. Decommissioning roads would restore natural drainage patterns and thereby avoid large volumes of added sediment to the stream network that would be likely to eventually occur. In addition limited road maintenance dollars could be focused on the remaining road systems resulting in more maintenance of culverts and ditchlines resulting in less potential for catastrophic failure. Madej (2000) concluded that by eliminating the risk of stream diversions and culvert failures, road removal treatments significantly reduce long-term sediment production from retired logging roads.

These projects have been designed by an interdisciplinary team of resource professionals on the Rogue River NF with input and coordination with the U.S. Fish and Wildlife Service, NOAA Fisheries, and State agencies. They were planned within the watersheds that would be affected by the Pacific Connector pipeline project. They are a component of the PCGP application and would be a requirement of the Right-of-Way grant. Overall, these projects would help maintain and restore riparian and soil resources on the Rogue River NF (see tables 2.2.1-3 and 2.2.1-4 and figures 2.2-1 and 2.2-2 for additional information).

2.2.1.3 Forest Plan Amendments Related Visual Resources (RRNF -2, RRNF-4):

Two Forest Plan standards associated with visual resources would need to be modified so that the proposed construction and operation of the Pacific Connector pipeline can be in compliance with the Rogue River NF LRMP.[7] These standards are:

- Management Strategy 6, Foreground Retention, Standard and Guideline (1), (RRNF LRMP 4-72). Manage the area for Retention Visual Quality Objective. Catastrophic occurrences may dictate a need for short term departure from Retention. Assess the impacts to visual resources in all project environmental analysis. Specifically address how the visual quality objective will be met.
- Management Strategy 9, Middle Ground Partial Retention, Standard and Guideline (1), (RRNF LRMP, 4-112). Manage the area for Partial Retention Visual Quality Objective. Catastrophic occurrences may dictate a need for short-term departure from Partial Retention Visual Quality Objective. Blend and shape regeneration openings with the natural terrain to the extent possible. Assess the impacts to visual resources in all project environmental analysis. Specifically address how the visual quality objective will be met.

The proposed amendments to these standards are:

- Management Strategy 6, Foreground Retention, Standard and Guideline (1), (RRNF LRMP 4-72). Manage the area for Retention Visual Quality Objective **(VQO), with the exception of the Pacific Connector Pipeline right-of-way, where the VQO would be amended to Foreground Partial Retention where the pipeline would cross the Big Elk Road. The applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented.** Catastrophic occurrences may dictate a need for short term departure from Retention. Assess the impacts to visual resources in all project environmental analysis. Specifically address how the visual quality objective will be met. (Proposed amendment RRNF-2)
- Management Strategy 7, Foreground Partial Retention, Standard and Guideline (4), (RRNF LRMP 4-86). Correct unacceptable form, line, color or texture as a result of management activities either during the operation or within two years after completion of the activity, **with the exception of the Pacific Connector Pipeline right-of-way which shall attain the amended VQO within 10 - 15 years after completion of the construction phase of the project where the pipeline crosses the Big Elk Road. The applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented.** (Proposed amendment RRNF-2)
- Management Strategy 9, Middle Ground Partial Retention, Standard and Guideline (1), (RRNF LRMP, 4-112). Manage the area for Partial Retention Visual Quality Objective, **with the exception of the Pacific Connector Pipeline right-of-way which shall attain**

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[7] In the DEIS there were two additional modifications associated with the visual guidelines for the Pacific Crest Trail (RRNF-3). The new crossing of the Pacific Crest Trail on an existing road has eliminated the need for this amendment (see section 3.4.2.9 of the FEIS).

> **the VQO within 10 - 15 years after completion of the construction phase of the project where the pipeline is adjacent to Highway 140.[8] The applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented.** Catastrophic occurrences may dictate a need for short-term departure from Partial Retention Visual Quality Objective. Blend and shape regeneration openings with the natural terrain to the extent possible. Assess the impacts to visual resources in all project environmental analysis. Specifically address how the visual quality objective will be met. (Proposed amendment RRNF-4)

While the amendments would provide an exception to meeting these standards, there would also be requirements to do what is appropriate, applicable and feasible to minimize, maintain or restore any effects of the pipeline's construction and operation on the visual resources within the area affected by the pipeline. Consequently, each amended standard includes the requirement that the "applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented".

The purpose of these two project-level amendments is to make the proposed Pacific Connector pipeline project consistent with the Rogue River NF LRMP. Thus, the substantive planning rule requirements that are directly related to these five amendments are:

- 36 CFR 219.10(a)(1) – […the responsible official shall consider: …] "(1) Aesthetic values,… scenery,... viewsheds...".
- 36 CFR 219.10(b)(i) – [the responsible official shall consider] "Sustainable recreation; including recreation settings, opportunities,…and scenic character…"

Because the proposed amendments are "directly related" to these two substantive requirements, the Responsible Official must apply the requirements within the scope and scale of the proposed amendments (36 CFR 219.13 (b)(5)).

In considering the "scope and scale" of the two amendments, it is important to recognize that the applicable sections of 36 CFR 219.10 that are described above, requires plan components to provide for aesthetic values and scenic character across the entire planning area (i.e., the Rogue River NF). These plan amendments do not alter these LRMP plan requirements for managing visual resources across 99.99% of the Rogue River NF. The proposed pipeline construction corridor including the TEWAs and the UCSAs is approximately 281 acres of the 628,443 acre Rogue River NF. Of the 281 acres of pipeline corridor construction it is estimated that approximately 14 of these acres would not meet the standards for visual resources described above.

The amendments modify three standards so that in the 281 acres of the project construction area the project need not be in compliance with these standards' specific requirements but instead, it is the "applicable mitigation measures identified in the POD and the Pacific Connector Project design requirements" that must be implemented. Or stated in another way, for the 281 acres of National Forest lands that would be within the operational right-of-way and construction zone for the Pacific Connector Pipeline, the two management requirements described above would be

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[8] Duration of impact specifications are found in the National Forest Landscape Management Handbook 462 (USDA Forest Service 1974). The recommended duration to meet standards for Middleground Partial Retention is 3 years (see RRNF LRMP FEIS p. III-119).

replaced with the full set of management requirements that comprise the “applicable mitigation measures identified in the POD and Pacific Connector Project Design requirements”. The inclusion of these management requirements as a part of the plan component language for the LRMP in this plan amendment, addresses the applicable 36 CFR 219.10 rule requirements within the “scope and scale” of these proposed plan amendments. The sections below describe in more detail how the applicable 36 CFR 219.10 requirements are being addressed.

How the Required Mitigation Measures would Consider, Minimize, Maintain or Restore Effects to Aesthetic Values and Scenic Character and Meet the Applicable 36 CFR 219.10(a) and 36 CFR 219.10(b)Requirements.

The Forest Service has worked to inventory, analyze, and evaluate visual resources, view sheds, and aesthetics that could be affected by this project. Forest Service landscape architect provided technical support to FERC and Forest Service third-party contractors by reviewing the information gathered for the project. The POD is a document developed between the FS, BLM, FERC, and PCGP that contains the design features, mitigation measures, roles and responsibilities, monitoring, and procedures for the construction and operation of the pipeline on NFS lands. In addition, FERC’s applicant prepared Plan and Procedures for construction and restoration enforceable, where applicable, for additional design features and mitigation. The design requirements and mitigation measures of the POD would be required by the modified standards and incorporated into BLM’s ROW grant.

The mitigation measures incorporated into amendments for Visual Quality Objectives, are designed to minimize, maintain or restore the potential for long-term impacts to visually sensitive areas. To ensure adequate restoration and revegetation of the ROW, design features are identified in the *Erosion Control and Revegetation Plan* (POD I), *Right-of-Way Clearing Plan* (POD U), *Leave Tree Protection Plan* (POD P), *Aesthetics Management Plan* (POD A), and *Recreation Management Plan* (POD S). A visual assessment was conducted to determine the potential effects on visual resources associated with the pipeline. Representative viewpoint points (also referred to as KOPs) were identified within the view shed for the pipeline, defined as the area from which the pipeline would be potentially visible. Photographs of existing visual conditions were used in preparing computerized visual simulations for each KOP. Because the appearance of the pipeline right-of-way would change with time, a series of simulations were prepared to illustrate how the pipeline right-of-way would look at different timeframes following construction. These KOPs would also serve as monitoring points for mitigation.

Pacific Connector produced POD A that outlined measures to reduce visual impacts along its pipeline route. To the extent feasible, PCGP would use revegetation efforts to shape and blend the pipeline easement, enhance the setting, and mimic the natural features of the landscape. These measures would consist of revegetating all disturbed areas and replanting trees in TEWAs and any other areas of the temporary construction right-of-way that were forested prior to construction (see POD I).

On Forest Service lands, PCGP would maintain a cleared 30-foot width centered over the pipe allowing the remainder of the permanent easement to be reforested. This allows trees to naturally reestablish along the edges of the permanent easement at a staggered, more natural-looking interval. Replacing slash in forested areas of the right-of-way during restoration activities would immediately affect the visual contrast in color and texture of the disturbed right-of-way areas. Over time, as the right-of-way revegetates and narrows in width and changes in form, texture and color, potential visual impacts would diminish.

Additionally, a row, or if necessary, clusters of trees and/or shrubs would be planted across the right-of-way to provide visual screens at key road and trail crossings in sensitive view sheds. For all revegetation practices, PCGP and/or its contractors would only use agency-approved tree and plant species, in compliance with management plan objectives and in consultation with agency specialists.

Site Specific Crossing Prescriptions:

Big Elk Road (MP 161.41). Within the Rogue River National Forest, the Pipeline crosses an area managed for Foreground Retention with high scenic integrity. PCGP would neck down to a width of 50 feet immediately adjacent to either side of the Big Elk Road crossing. The construction right-of-way would then expand from 50 feet to the full 95-foot construction right-of-way width at 100 feet from either side of the road. To ensure that the appropriate large trees are conserved on either side of Big Elk Road, PCGP's Environmental Inspectors would verify the limits of the staked construction limits in conjunction with a Forest Service representative (see POD P). PCGP would implement the mitigation recommendations detailed in Section 3.2 and 3.3 and further described in the POD I to minimize, maintain or restore potential visual effects at this road crossing, and a buffer of vegetation would mask the right-of-way on both sides of the road. PCGP would additionally revegetate the right-of-way using large native trees and shrubs to begin the mitigation process.

During construction of the Project, Compliance Monitors representing FERC are present on a full-time basis to inspect construction procedures and mitigation measures and provide regular feedback on compliance issues to FERC and the Forest Service. Objectives of the Compliance Monitoring program are to: facilitate the timely resolution of compliance issues in the field; provide continuous information to FERC regarding noncompliance issues and their resolution; and review, process, and track construction-related variance requests. Changes to previously approved mitigation measures, construction procedures, and construction work areas due to unforeseen or unavoidable site conditions would require various levels of regulatory approval from the applicable land management agencies. FERC would have the authority to stop any activity that violates an environmental condition of the FERC authorization issued to PCGP.

Additionally, environmental compliance oversight responsibilities for PCGP, FERC, FS and BLM are described in the POD (*Environmental Briefings and Compliance Plan*, POD G) that would apply to the construction, operation, and maintenance of the project specifically on NFS lands. The FS Authorized Officer would coordinate with the BLM in administering and enforcing ROW grant provisions and would have stop-work authority. The FS Authorized Officer's designated representatives would ensure that the stipulations and mitigation measures included in the POD that are designed to minimize, maintain or restore the effects to visual resources and recreational resources are adhered to during project construction, operation, and maintenance. The BLM Authorized Officer would coordinate with the FS to ensure the work is being conducted in accordance with the ROW grant and agreed upon conditions. BLM and the FS would have stop-work authority. Field variance requests would be coordinated with the Authorized Officers.

TABLE 2.2.1-1

Proposed LRMP Amendments on the Rogue River NF

Amendment	**Description**	**Text of Proposed Amendment**	**Related Planning Rule Requirements**	**Pacific Connector pipeline Impacts**	**Project Design Features**	**Compensatory Mitigation**[9]
FS-1: Project-Specific Amendment to Exempt Management Recommendations for Survey and Manage Species on the Rogue River NF.	The Rogue River NF LRMP (RRNF LRMP 1990) would be amended to exempt certain known sites within the area of the proposed Pacific Connector right-of-way grant from the Management Recommendations required by the 2001 "Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (Survey and Manage ROD) For known sites within the proposed right-of-way that cannot be avoided, the 2001 Management Recommendations for protection of known sites of Survey and Manage species would not apply. For known sites located outside the proposed right-of-way but with an overlapping protection buffer only that portion of the buffer within the right-of-way would be exempt from the protection requirements of the Management Recommendations. Those Management Recommendations would remain in effect for that portion of the protection buffer that is outside of the right of way. The proposed amendment would not exempt the Forest Service from the requirements of the Survey and Manage ROD, as modified, to maintain species persistence for affected Survey and Manage species within the range of the northern spotted owl. This is a project-specific plan amendment applicable only to the Pacific Connector Pipeline Project and would not change future management direction for any other project. The amendment would provide an exception from these standards for the Pacific Connector Project and include specific mitigation measures and project design requirements for the project.	Management Direction: Manage All Known Sites (Survey and Manage ROD, Standards and Guidelines Page 8). Current and future known sites will be managed according to the Management Recommendation for the species, **with the exception of the operational right-of-way and the construction zone for the Pacific Connector Pipeline, for which the applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented.** Professional judgment, Appendix J2 in the Northwest Forest Plan Final SEIS, and appropriate literature will be used to guide individual site management for those species that do not have Management Recommendations.	The 36 CFR 219 planning rule requirements that are directly related to this amendment include: § 219.9(a)(2)(ii) – [the plan must include plan components to maintain or restore] "Rare aquatic and terrestrial plant and animal communities." § 219.9(b)(1) – "The responsible official shall determine whether or not the plan components required by paragraph (a) provide ecological conditions necessary to: …maintain viable populations of each species of conservation concern within the plan area."	73 acres of late successional and old growth (LSOG) habitat directly impacted from construction activity[10] 281 total acres impacted from construction activity 90 survey and manage sites potentially impacted This amendment would affect approximately 0.03% of the Rogue River NF	POD (I) Erosion Control and Revegetation Plan POD (J) Plant Conservation Plan POD (P) Leave Tree Protection Plan POD (U) Right-of-Way Clearing Plan Chapter 3, FEIS Route Design and Modifications on NFS lands Appendix F5, Survey and Manage Persistence Evaluations	Reallocation of Matrix Lands to LSR – 522 Acres Stand Density Management – 618 acres Terrestrial Habitat Improvements – 1,153 acres Road Decommissioning in LSR – 57.5 miles
RRNF-2: Project Specific Amendment of Visual Quality Objectives (VQO) on	The Rogue River NF LRMP would be amended to change the VQO where the Pacific Connector pipeline route crosses the Big Elk Road at about pipeline MP 161.4 in Section 16,	Management Strategy 6, Foreground Retention, Standard and Guideline (1), (RRNF LRMP 4-72). Manage	The 36 CFR 219 planning rule requirements that are directly related to this amendment include: § 219.10(a)(1) – […the	One crossing of the Big Elk Road that would exceed VQO standards.	POD (A) Aesthetics Management Plan for Federal Lands	

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[9] The compensatory mitigation listed in this column reflects the mitigation most related to the proposed amendment. It should be noted that other actions in the CMP may also be beneficial.

[10] Direct Impacts include acres cleared for construction in the construction corridor and temporary extra work areas (TEWA), as well as acres modified from uncleared storage areas (UCSA)

TABLE 2.2.1-1

Proposed LRMP Amendments on the Rogue River NF

Amendment	Description	Text of Proposed Amendment	Related Planning Rule Requirements	Pacific Connector pipeline Impacts	Project Design Features	Compensatory Mitigation[9]
the Big Elk Road:	T.37S., R.4E., W.M., OR, from Foreground Retention (Management Strategy 6, LRMP page 4-72) to Foreground Partial Retention (Management Strategy 7, LRMP page 4-86) and allow 10-15 years for amended VQO to be attained. The existing Standards and Guidelines for VQO in Foreground Retention where the Pacific Connector pipeline route crosses the Big Elk Road require that VQOs be met within one year of completion of the project and that management activities not be visually evident. The amendment would provide an exception from these standards for the Pacific Connector Pipeline Project and include specific mitigation measures and project design requirements for the project. This is a project-specific plan amendment that would apply only to the Pacific Connector Pipeline Project in the vicinity of Big Elk Road and would not change future management direction for any other project.	the area for Retention Visual Quality Objective **(VQO), with the exception of the Pacific Connector Pipeline right-of-way, where the VQO would be amended to Foreground Partial Retention where the pipeline would cross the Big Elk Road. The applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented.** Catastrophic occurrences may dictate a need for short term departure from Retention. Assess the impacts to visual resources in all project environmental analysis. Specifically address how the visual quality objective will be met. Management Strategy 7, Foreground Partial Retention, Standard and Guideline (4), (RRNF LRMP 4-86). Correct unacceptable form, line, color or texture as a result of management activities either during the operation or within two years after completion of the activity, **with the exception of the Pacific Connector Pipeline right-of-way which shall attain the amended VQO within 10 - 15 years after completion of the construction phase of the project where the pipeline crosses the Big Elk Road. The applicable mitigation measures identified in the POD and Pacific Connector project design requirements**	responsible official shall consider: …] "(1) Aesthetic values,… scenery,... viewsheds...". § 219.10(b)(i) – [the responsible official shall consider] "Sustainable recreation; including recreation settings, opportunities,…and scenic character…"	This amendment would only affect approximately 5 acres (less than 0.001%) of the Rogue River NF	POD (I) Erosion Control and Revegetation Plan POD (P) Leave Tree Protection Plan POD (U) Right-of-Way Clearing Plan	

TABLE 2.2.1-1

Proposed LRMP Amendments on the Rogue River NF

Amendment	Description	Text of Proposed Amendment	Related Planning Rule Requirements	Pacific Connector pipeline Impacts	Project Design Features	Compensatory Mitigation[9]
		must be implemented.				
RRNF-4: Project-Specific Amendment of Visual Quality Objectives Adjacent to Highway 140:	The Rogue River NF LRMP would be amended to allow 10-15 years to meet the VQO of Middleground Partial Retention between Pacific Connector pipeline MPs 156.3 to 156.8 and 157.2 to 157.5 in Sections 11 and 12, T.37S., R.3E., W.M., OR. Standards and Guidelines for Middleground Partial Retention (Management Strategy 9, LRMP Page 4-112) require that VQOs for a given location be achieved within three years of completion of the project. Approximately 0.8 miles or 9 acres of the Pacific Connector right-of-way in the Middleground Partial Retention VQO visible at distances of 0.75 to 5 miles from State Highway 140 would be affected by this amendment. The amendment would provide an exception from these standards for the Pacific Connector Pipeline Project and include specific mitigation measures and project design requirements for the project. This is a project-specific plan amendment that would apply only to the Pacific Connector Pipeline Project in Sections 11 and 12, T.37S., R.3E., W.M., OR, and would not change future management direction for any other project.	Management Strategy 9, Middle Ground Partial Retention, Standard and Guideline (1), (RRNF LRMP, 4-112). Manage the area for Partial Retention Visual Quality Objective, **with the exception of the Pacific Connector Pipeline right-of-way which shall attain the VQO within 10 - 15 years after completion of the construction phase of the project where the pipeline is adjacent to Highway 140.**[11] **The applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented.** Catastrophic occurrences may dictate a need for short-term departure from Partial Retention Visual Quality Objective. Blend and shape regeneration openings with the natural terrain to the extent possible. Assess the impacts to visual resources in all project environmental analysis. Specifically address how the visual quality objective will be met.	The 36 CFR 219 planning rule requirements that are directly related to this amendment include: § 219.10(a)(1) – […the responsible official shall consider: …] "(1)Aesthetic values,… scenery,... viewsheds...". § 219.10(b)(i) – [the responsible official shall consider] "Sustainable recreation; including recreation settings, opportunities, . . . and scenic character...".	Approximately 0.8 miles of VQO standards along Hwy 140 would be exceeded This amendment would only affect about 9 acres (0.001 %) of the Rogue River NF	POD (A) Aesthetics Management Plan for Federal Lands POD (I) Erosion Control and Revegetation Plan POD (P) Leave Tree Protection Plan POD (U) Right-of-Way Clearing Plan	
RRNF-5: Project-Specific Amendment to Allow the Pacific Connector Pipeline Project in	The Rogue River NF LRMP would be amended to allow the Pacific Connector right-of-way to cross the Restricted Riparian land allocation. This would potentially affect approximately 2.5 acres of the Restricted Riparian Management	Management Prescription 26 Restricted Riparian Standard & Guidelines for Facilities (10), (RRNF LRMP 4-308). Helispots and transmission	The 36 CFR 219 planning rule requirements that are directly related to this amendment include: § 219.8(a)(3)(i) – The plan must include plan	approximately 2.5 acres of the Restricted Riparian Management Strategy at one perennial stream crossing on the South Fork of Little Butte	POD (I) Erosion Control and Revegetation Plan POD (U) Right-of-Way Clearing	Aquatic and Riparian Habitat – Large Woody Debris Instream - 1.5 miles Aquatic and Riparian Habitat

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[11] Duration of impact specifications are found in the National Forest Landscape Management Handbook 462 (USDA Forest Service 1974). The recommended duration to meet standards for Middleground Partial Retention is 3 years (see RRNF LRMP FEIS p. III-119).

TABLE 2.2.1-1

Proposed LRMP Amendments on the Rogue River NF

Amendment	**Description**	**Text of Proposed Amendment**	**Related Planning Rule Requirements**	**Pacific Connector pipeline Impacts**	**Project Design Features**	**Compensatory Mitigation**[9]
Management Strategy 26, Restricted Riparian Areas:	Strategy at one perennial stream crossing on the South Fork of Little Butte Creek at about pipeline MP 162.45 in Section 15, T.37S., R.4E., W.M., OR. Standards and Guidelines for the Restricted Riparian land allocation prescribe locating transmission corridors outside of this land allocation (Management Strategy 26, LRMP page 4-308,). The amendment would provide an exception from these standards for the Pacific Connector Pipeline Project and include specific mitigation measures and project design requirements for the project. This is a site-specific amendment applicable only to the Pacific Connector Pipeline Project and would not change future management direction for any other project.	corridors should be located outside this management area, **with the exception of the operational right-of-way and the construction zone for the Pacific Connector Pipeline, for which the applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented**.	components "to maintain or restore the ecological integrity of riparian areas in the plan area, including plan components to maintain or restore structure, function, composition, and connectivity"	Creek would be affected This amendment would only affect approximately 2.5 acres (less than 0.001%) of the Rogue River NF	Plan POD (BB) Wetland and Waterbody Crossing Plan Forest Service Site Specific Stream Crossing Prescriptions (NSR 2014) Stream Crossing Risk Analysis; and Stream Crossing Risk Analysis Addendum (GeoEngineers2017d, 2018a) Chapter 3,FEIS Route Design and Modifications on Forest Service Managed Lands	Stream Crossing Repair - 32 Sites Road Decommissioning – 57.5 miles
RRNF-6: Site-Specific Amendment to Exempt Limitations on Detrimental Soil Conditions within the Pacific Connector Right-of-Way in All Management Areas:	The Rogue River NF LRMP would be amended to exempt limitations on areas affected by detrimental soil conditions from displacement and compaction within the Pacific Connector right-of-way in all affected Management Strategies. Standards and Guidelines for detrimental soil impacts in affected Management Strategies require that no more than 10 percent of an activity area should be compacted, puddled or displaced upon completion of project (not including permanent roads or landings). No more than 20 percent of the area should be displaced or compacted under circumstances resulting from previous management practices including roads and landings. Permanent recreation facilities or other permanent facilities are exempt (RRNF LRMP 4-41, 4-83, 4-97, 4-123, 4-177, 4-307). The amendment would provide an exception from these standards for the Pacific Connector Pipeline Project and include specific mitigation measures and project design requirements for the project. This is a project-specific plan amendment applicable only to the Pacific Connector Pipeline Project and would not change future management direction for any	Standard & Guideline for Soils (3) (RRNF LRMP 4-41, 4-83, 4-97, 4-123, 4-177, 4-307). No more than 10 percent of an activity area should be compacted, puddled or displaced upon completion of project (not including permanent roads or landings). No more than 20 percent of the area should be displaced or compacted under circumstances resulting from previous management practices, including roads and landings, **with the exception of the operational right-of-way and the construction zone for the Pacific Connector Pipeline, for which the applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented.** Permanent	The 36 CFR 219 planning rule requirements that are directly related to this amendment include: § 219.8(a)(2)(ii) – [The plan must include plan components to maintain or restore] "soils and soil productivity, including guidance to reduce soil erosion and sedimentation."	Approximately between 62 and 144 acres of detrimental soil conditions could result from the pipeline construction This amendment would affect approximately 0.02% of the Rogue River NF	POD (I) Erosion Control and Revegetation Plan POD (U) Right-of-Way Clearing Plan Technical Report on Soil Risk and Sensitivity Assessment (NSR 2014)	Road Decommissioning – approximately 57.5 Miles

TABLE 2.2.1-1

Proposed LRMP Amendments on the Rogue River NF

Amendment	**Description**	**Text of Proposed Amendment**	**Related Planning Rule Requirements**	**Pacific Connector pipeline Impacts**	**Project Design Features**	**Compensatory Mitigation**[9]
	other project.	recreation facilities or other permanent facilities are exempt.				
RRNF-7: Reallocation of Matrix Lands to LSR	The Rogue River NF LRMP would be amended to change the designation of approximately 522 acres from Matrix land allocations to the LSR land allocation in Section 32, T.36S., R.4E. W.M., OR. This change in land allocation is proposed to partially mitigate the potential adverse impact of the Pacific Connector Pipeline Project on LSR 227 on the Rogue River NF. This is a plan level amendment that would change future management direction for the lands reallocated from Matrix to LSR.		The 36 CFR 219 planning rule requirements that are directly related to this amendment include: § 219.8(a)(1)(i) – [the plan must include plan components to maintain or restore] “Interdependence of terrestrial and aquatic ecosystems in the plan area.” § 219.8(b)(1) – [the plan must include plan components to guide the plan area’s contribution to social and economic sustainability] “Social, cultural and economic conditions relevant to the area influenced by the plan.” § 219.9(b)(1) “The responsible official shall determine whether or not the plan components required by paragraph (a) of this section provide the ecological conditions necessary to: contribute to the recovery of federally listed threatened and endangered species, conserve proposed and candidate species, and maintain a viable population of each species of conservation concern within the plan area”, and § 219.9(a)(2)(ii)– [the plan must include plan components to maintain or restore: …] “(ii) Rare aquatic and terrestrial plant and animal communities”.	Approximately 52 acres of LSOG and 142 acres of Non-LSOG forest would be cleared within LSR 227 This amendment would affect approximately 0.08% of the Rogue River NF	POD (I) Erosion Control and Revegetation Plan POD (U) Right-of-Way Clearing Plan	Reallocation of Matrix Lands to LSR – approximately 237 acres of LSOG and 285 acres of Non-LSOG habitat would be reallocated from matrix to LSR 227 Stand Density Management – 618 acres Terrestrial Habitat Improvement – 1,153 acres Road Decommissioning in LSR – 57.5 miles

TABLE 2.2.1-2

Mitigation Projects to Address LRMP Objectives on the Rogue River NF

Unit	Watershed	Mitigation Group	Project Type	Project Name	Quantity a/	Unit
Rogue River NF	Little Butte Creek	Aquatic and Riparian Habitat	LWD In-stream	South Fork Little Butte Creek. LWD	1.5	mile
		Aquatic and Riparian Habitat	Stream Crossing Repair	Little Butte Creek Stream Crossing Decommissioning	32	sites
		Road sediment reduction	Road Decommissioning	Little Butte Creek Road Decommissioning	57.5	miles
		Stand Density Fuel Break	Pre-commercial Thinning	Little Butte Creek LSR Pre-commercial Thin	618	acres
		Terrestrial Habitat Improvement	Habitat Planting	Little Butte Creek Mardon Skipper Butterfly	20	acres
		Terrestrial Habitat Improvement	LWD Upland Placement	Little Butte Creek LSR LWD Placement	511	acres
		Terrestrial Habitat Improvement	Snag Creation	Little Butte Creek LSR Snag Creation	622	acres
		Reallocation of Matrix Lands to LSR	Land Reallocation from Matrix to LSR	LRMP Amendment RRNF 7, LSR 227 Reallocation	25	acres
	Big Butte Creek	Reallocation of Matrix Lands to LSR	Land Reallocation from Matrix to LSR	LRMP Amendment RRNF 7, LSR 227 Reallocation	497	acres

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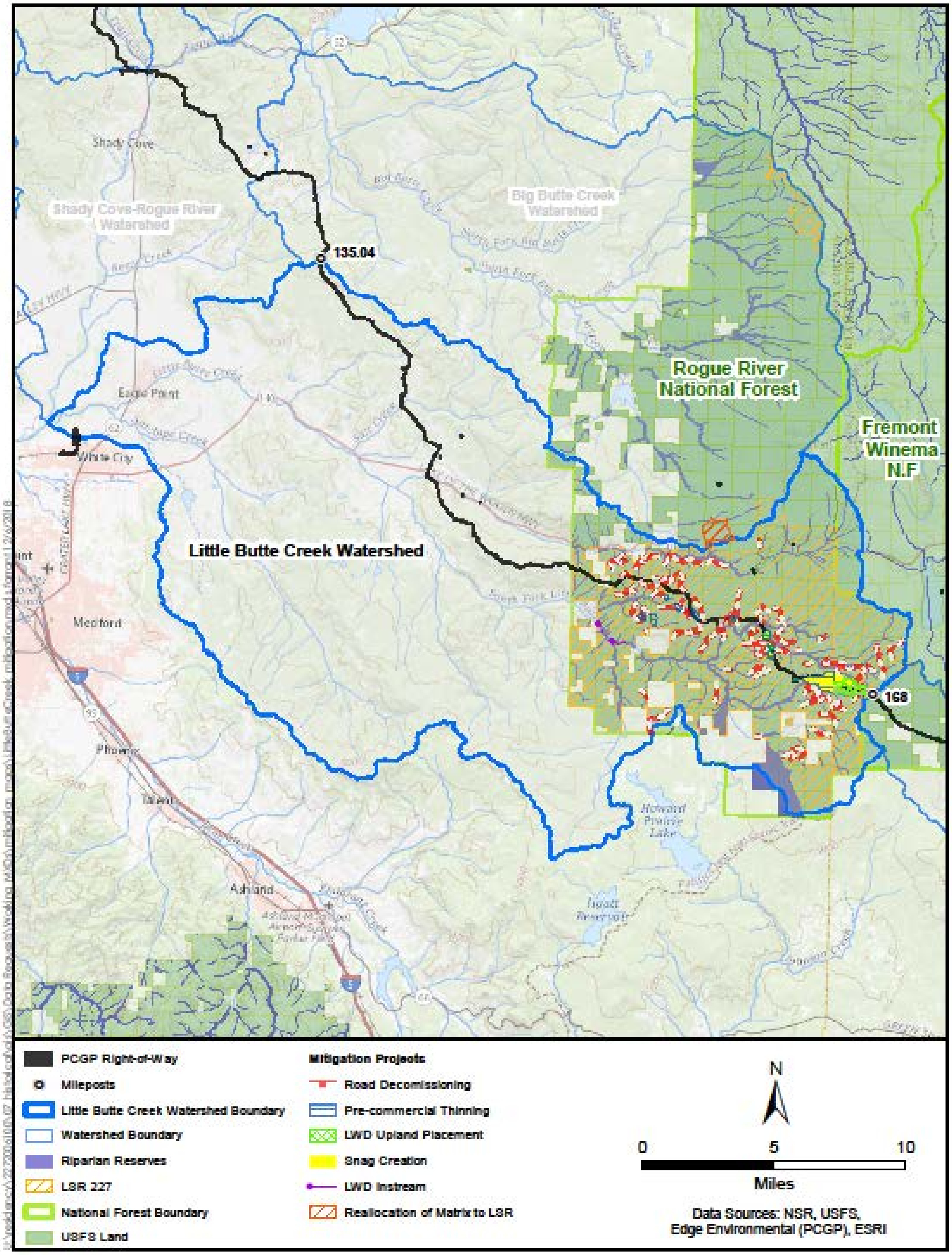
a/ Acres are rounded to the nearest whole acre and miles to the nearest tenth of a mile.

Figure 2.2-1. Map of CMP Projects in the Little Butte Creek Watershed on the Rogue River NF[12]



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[12] The reallocation of matrix to LSR in the Big Butte Watershed is also shown on this map.

TABLE 2.2.1-3

Summary of Rogue River NF Mitigation Projects by Mitigation Group and Project Type

Mitigation Group	Project Type	Amount	Rationale	Environmental Consequences
Aquatic and Riparian Habitat	Large Woody Debris In-stream	1.5 Miles	Placement of LWD in streams adds structural complexity to aquatic systems by creating pools and riffles, trapping fine sediments and can contribute to reductions in stream temperatures over time (Tippery et al. 2010). This is responsive to Aquatic Conservation Strategy (ACS) objectives 2, 3, 4, and 5.	**Short-term adverse effects**: LWD in-stream refers to logs (typically greater than 20 inches in diameter), limbs, or root wads that intrude into a stream channel. Placing this material in-stream can be accomplished with ground equipment such as excavators and/or helicopters. These activities have the potential to increase suspended sediment in streams and impact riparian vegetation as a result of heavy equipment use or the dragging of materials (e.g. logs) in the stream channel. Short-term impacts to water quality would occur in the form of suspended sediment and turbidity increases during in-stream implementation. However, no lasting measureable effect to water quality would occur as any sediment plume created, would quickly dissipate as soon as in-stream activities stop. In-stream work is done during summer low flow periods when turbidity plumes are an infrequently occurring event. Project design features (PDF) would include Best Management Practices (BMP) that would prevent any indirect effects to salmonids and other stream fish from project related sediment. The placement of LWD materials in the stream by using cable systems, excavators, or helicopters would create noise that could disturb NSO. The PDFs would focus disturbance outside the critical nesting period and beyond critical distances for NSO. These PDFs would reduce impacts from noise to acceptable levels. **Long-term beneficial effects:** Placing LWD in streams affects channel morphology, the routing and storage of water and sediment, and provides structure and complexity to stream systems. Complex pools and side channels created by instream wood provide overwintering habitat to stream salmonids and other aquatic organisms (Solazzi et. al. 2000). They also provide cover from predators during summer low flow periods when predation is at its highest. Providing more stream channel structure results in better over wintering habitat, improved summer pool habitat, and more abundant spawning gravels.
Aquatic and Riparian Habitat	Stream Crossing Repair	32 Sites	Restoring stream crossings reconnects aquatic habitats by allowing the passage of aquatic biota and restoring riparian vegetation. Over time, these actions reduce sediment and restore shade. Restoration of these crossings includes riparian planting as a mitigation which will help offset the impact of shade removal at pipeline R/W crossings.	**Short-term adverse effects:** Removing old culverts and restoring stream/road crossings would result in short-term adverse effects similar to the effects described for LWD above since both involve the use of heavy equipment in and around the stream channel. Similarly the work would be done during low summer flow periods to minimize impacts to aquatic species and PDFs would be designed to minimize disturbance for Northern Spotted Owl (NSO). **Long-term beneficial effects:** Stream crossing replacement would directly improve stream connectivity and habitat for aquatic species by immediately restoring access to formerly inaccessible habitats. Indirectly, these projects would reduce potential sediment levels in the long term by decreasing the potential for road failure. Stream crossing projects also reduce stream velocities by increasing stream crossing sizes, eliminating flow restrictions and allowing passage to additional reaches of habitat by removing barriers to aquatic species which improves access to spawning and rearing habitat and allows unrestricted movement throughout stream reaches during seasonal changes in water levels (Hoffman 2007)**.**
Road Sediment Reduction	Road Decommissioning	57.5 Miles	Road closure reduces fine grained sediments by eliminating traffic impacts. Decommissioning roads can substantially reduce sediment delivery to streams (Madej 2000; Keppeler et al. 2007). Proposed road decommissioning would increase infiltration of precipitation, reduce surface runoff, and reduce sediment production from road-related surface erosion in the watershed where the impacts from the Project occur.	**Short-term adverse effects:** Road decommissioning methods generally include actions utilizing mechanized construction equipment to physically stabilize the road prism, restore natural drainage patterns, and allow for revegetation of the roadbed. Mechanized construction equipment might include excavators, backhoes and truck mounted loaders. Road closure is a method of preventing access to a road so that regular maintenance is no longer needed and future erosion is largely prevented by restoring drainage patterns if necessary and eliminating road traffic. Road decommissioning has the potential to cause short-term degradation of water quality by increasing sediment delivery to streams as roads are de-compacted by heavy equipment, culverts and cross

TABLE 2.2.1-3

Summary of Rogue River NF Mitigation Projects by Mitigation Group and Project Type

Mitigation Group	Project Type	Amount	Rationale	Environmental Consequences
				drains are removed, and other restoration activities are implemented. The use of heavy mechanized equipment near streams could disturb the stream influence zone, deliver sediment, create turbidity, and cause stream bank erosion. There is also the potential of an accidental fuel/oil spill. These projects may cause a short-term degradation of water quality due to sediment input and chemical contamination. Stream bank condition and habitat substrate may also be adversely affected in the short term. However with careful project design and seasonal timing, these affects are expected to be of a limited extent and duration. Road decommissioning would create noise from heavy equipment that could disturb NSO. The potential for disturbance is mainly associated with breeding behavior at active nest sites. The PDFs would focus disturbance outside the critical nesting period and beyond critical distances for NSO. These PDFs would reduce impacts from noise to acceptable levels. **<u>Long-term beneficial effects</u>**: Proposed road decommissioning would increase infiltration of precipitation, reduce surface runoff, and reduce sediment production from road-related surface erosion in the watershed where the impacts from the Project would occur. Decommissioning roads would restore natural drainage patterns and thereby avoid large volumes of added sediment to the stream network that would be likely to eventually occur. In addition limited road maintenance dollars could be focused on the remaining road systems resulting in more maintenance of culverts and ditchlines resulting in less potential for catastrophic failure. Madej (2000) concluded that by eliminating the risk of stream diversions and culvert failures, road removal treatments significantly reduce long-term sediment production from retired logging roads.
Stand Density Management	Pre-commercial Thinning LSR	618 Acres	There will be direct impacts to existing interior, developing interior habitat. The project will result in additional fragmentation and preclude the recovery of fragmented habitat for those stands adjacent to the pipeline corridor. Both mature stands and developing stands will be removed during pipeline construction. Density management of forested stands will assist in the recovery of late-seral habitat, impact from fragmentation, reduction in edge effects and enhance resilience of mature stands. Accelerating development of mature forest characteristics will shorten the impacts of those biological services loss due to pipeline construction. Thinning of young stands is a recognized treatment within LRSs if designed to accelerate development of late-successional habitat characteristics.	**<u>Short-term adverse effects:</u>** Pre-commercial stand density management activities include the use of chain saws for cutting forest vegetation. Stand treatments would not be expected to adversely affect nesting habitat for the NSO since the treatments would not remove constituent elements of their nesting habitat. The proposed treatments could temporarily impact acres of dispersal habitat. This habitat would be impacted by reduction of canopy cover. The potential for disturbance is mainly associated with breeding behavior at active nest sites. The PDFs would focus disturbance outside the critical nesting period and beyond critical distances for NSO. These PDFs would reduce impacts from noise to acceptable levels. **<u>Long-term beneficial effects:</u>** By creating less dense stands with less tree competition, residual trees would benefit from the increased availability of sunlight, nutrients, and water. With the increase of available nutrients, trees should be more vigorous and less susceptible to large scale insect/disease outbreaks. The proposed treatments would enhance LSOG habitat by increasing the growth, health, and vigor of the trees remaining in the stands; restoring stand density, species diversity, and structural diversity to those considered characteristic under a natural disturbance regime.
Terrestrial Habitat Improvement	LWD Upland Placement LSR	511 Acres	The objective is to mitigate for the loss of recruitment of large down wood to adjacent stands and within the construction clearing zone. The project will forgo the development of large down wood for the life of the project and for decades after. Downed wood is a critical component of mature forest ecosystems. Large wood replacement will partially mitigate for the barrier effect of the corridor by creating structure across the corridor for use by small wildlife species. Placement in wood deficient areas adjacent to the corridor allows for scattering of stockpiled wood, reducing localized fuel loads while improving	**<u>Short-term adverse effects:</u>** Placement of LWD within and adjacent to the pipeline corridor would typically be done with heavy equipment that would drag the material into place. Heavy equipment use would increase the amount of detrimental soil damage within the treatment areas. By maintaining proper amounts of protective groundcover along with appropriate BMPs and PDFs, the risk of erosion, sediment delivery, and detrimental soil damage within the treatment areas is expected to be minimal and within LMP standards and guidelines. LWD placement would create noise from heavy equipment that could disturb the NSO. The potential for disturbance is mainly associated with breeding behavior at active nest sites. The PDFs would focus disturbance outside the critical nesting period and beyond critical distances for NSO. These PDFs would reduce

TABLE 2.2.1-3

Summary of Rogue River NF Mitigation Projects by Mitigation Group and Project Type

Mitigation Group	Project Type	Amount	Rationale	Environmental Consequences
			habitat in deficient stands. Larger logs maintain moisture longer and are less likely to be fully consumed by fire. Managing for the proposed levels provide for a greater assurance of species abundance.	impacts from noise to acceptable levels. **Long-term beneficial effects:** Beneficial effects include improving habitat for late-successional and other species and providing for long-term soil productivity.
Terrestrial Habitat Improvement	Snag Creation	622 Acres	Objective is to mitigate immediate and future impacts to snag habitat from the clearing of the pipeline right-of-way. The project prevents development of large snags during the life of the project and for decades after. Corridor construction will result in loss of snag habitat. As snags are a critical component of spotted owl habitat, replacement is needed. Replacement would be immediate though there would be a 10 year delay as snag decay develops.	**Short-term adverse effects:** Snag creation typically employs the use of chainsaws or inoculum to kill live trees. As such there is little if any ground disturbance and only minimal noise disturbance. The potential for noise disturbance is mainly associated with breeding behavior at active NSO nest sites. The PDFs would focus disturbance outside the critical nesting period and beyond critical distances for NSO. These PDFs would reduce impacts from noise to acceptable levels. Any adverse environmental impacts would be de minimus and very short term. **Long-term beneficial effects**: Beneficial impacts include the improvement of habitat for snag dependent species and in particular those species dependent on LSOG forests. Long-term benefits would also accrue as the created snags decay over time and eventually provide for LWD on the forest floor improving habitat for many other species and contributing to long-term soil productivity.
Terrestrial Habitat Improvement	Habitat Planting	20 Acres	The Dead Indian Plateau region is one of four known sites for Mardon Skipper butterflies in the world. It is also adjacent to a known site for Short-horned Grasshoppers. Both species are on the Regional Forester's Sensitive Species list. As a long-term opening, the pipeline corridor would provide a unique opportunity to develop habitat for these two species. Planting the corridor with plants preferred by these species has the potential to increase the habitat and local range for both species. This action would provide both short-term and long-term habitat for the local population of Mardon skipper butterflies and short-horned grasshoppers.	**Short-term adverse effects:** This activity would take place within the Pacific Connector pipeline corridor and would not result in any additional adverse impacts. **Long-term beneficial effects**: Beneficial impacts include helping to re-vegetate and stabilize the pipeline corridor and improving habitat for listed or sensitive insect species.
Reallocation of Matrix Lands to LSR	Reallocation of Matrix to LSR	522 Acres	This mitigation group contributes to the "neutral to beneficial" standard for new developments in LSRs by adding acres to the LSR land allocation to offset the long-term loss of habitat due to the construction and operation of the pipeline project. It compensates for the removal of suitable nesting, roosting, and foraging NSO habitat by adding additional LSOG acres to the LSR land allocation. Reallocation of matrix lands to LSR also contributes to ACS objectives and may benefit Survey and Manage species by providing additional habitat that is managed to create LSOG stand conditions over time.	**Short-term adverse effects:** The reallocation of matrix lands to LSR is an administrative action that would not have any immediate environmental consequences on the ground. **Long-term beneficial effects:** The proposed reallocation would change the management direction of approximately 522 acres from one of multiple uses with an emphasis on timber management to a management emphasis focusing on the creation and maintenance of late-successional forest habitat. Over time, this reallocation would benefit species dependent on late-successional forests through management actions that would be designed to improve or maintain late-successional habitat conditions.

TABLE 2.2.1-4

Comparison of Total Acres of Proposed Project-Specific Amendments and Compensatory Mitigation on the Rogue River NF

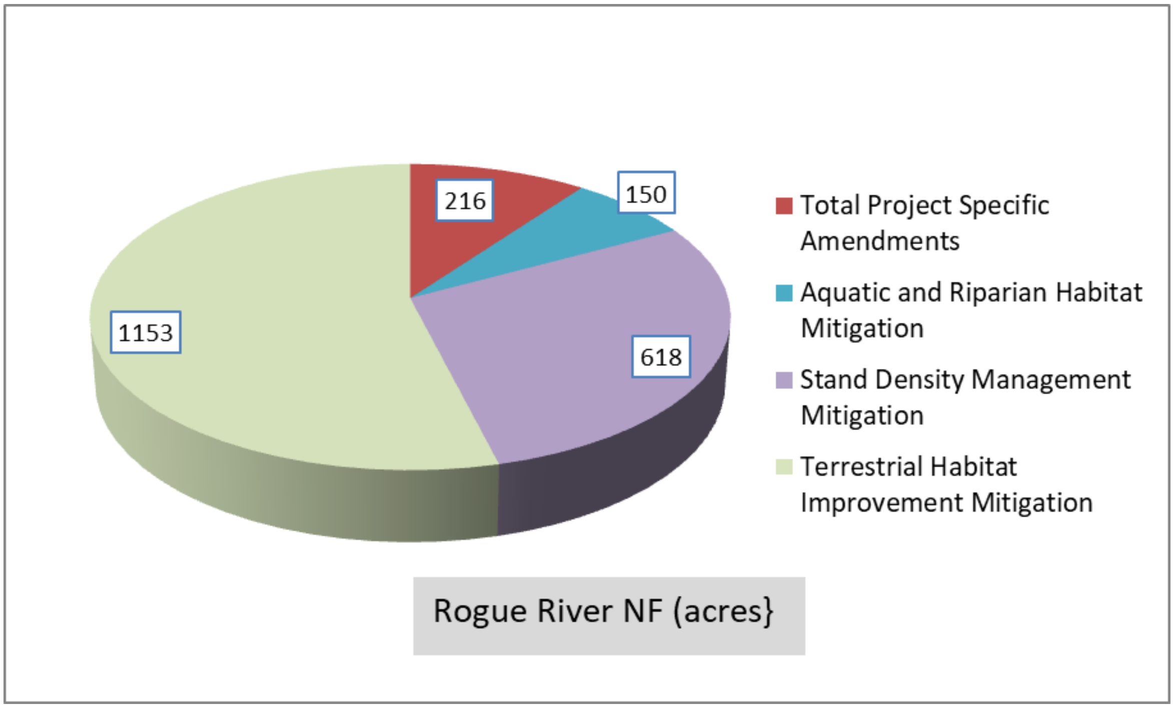
Amendments and Compensatory Mitigation	Acres
Total Project Specific Amendments[1]	216
Aquatic and Riparian Habitat Mitigation[2]	150
Stand Density Management and Fuel Break Mitigation	618
Terrestrial Habitat Improvement Mitigation	1153

Data Source: USFS GIS Data Layers

1) Includes amendments FS-1, RRNF-2, RRNF-4, RRNF-5 and RRNF-6

2) Includes road sediment reduction actions and assumes a 20 foot wide treatment area

Figure 2.2-2. Comparison of Total Acres of Proposed Project-Specific Amendments and Compensatory Mitigation on the Rogue River NF



2.3 WINEMA NF

There are six proposed forest plan amendments for the Pacific Connector pipeline project on the Winema NF. An evaluation of how the proposed amendments relate to the planning requirements in 36 CFR 219.8 – 219.11 is discussed in section 2.3.1 below. These proposed amendments are summarized in table 2.3.1-1 along with the project impacts and related project design features (PDF) and compensatory mitigation. The proposed CMP projects are listed in table 2.3.1-2 and evaluated in table 2.3.1-3, table 2.3.1-4, and figure 2.3-2 below. A map of the proposed CMP projects by watershed is displayed in figure 2.3-1.

2.3.1 Evaluation of Winema NF Proposed Forest Plan Amendments

The proposed Pacific Connector pipeline incorporates the most up-to-date engineering and technological practices for pipeline construction and operation. However, even with following these practices, it has been determined that one Forest Plan standard associated with rare and/or isolated species (Survey and Manage), two Forest Plan standards associated with the soil, water, and riparian resources, and three Forest Plan standards associated with visual resources would need to be modified so that the proposed construction and operation of the Pacific Connector pipeline can be in compliance with the Winema NF LRMP as amended by the NWFP and the January 2001 Survey and Manage ROD.

2.3.1.1 Forest Plan Amendments Related to Rare Aquatic and Terrestrial Plant and Animal Communities (FS-1):

*Amendment FS-1***:** *Project-Specific Amendment to Exempt Management Recommendations for Survey and Manage Species on the Winema NF.*

One Forest Plan standard associated with rare and/or isolated species (Survey and Manage) would need to be modified so that the proposed construction and operation of the Pacific Connector pipeline can be in compliance with the Winema NF LRMP as amended by the NWFP and the January 2001 Survey and Manage ROD. This standard is:

- Management Direction: Manage All Known Sites (Survey and Manage ROD, Standards and Guidelines Page 8). Current and future known sites will be managed according to the Management Recommendation for the species. Professional judgment, Appendix J2 in the Northwest Forest Plan Final SEIS, and appropriate literature will be used to guide individual site management for those species that do not have Management Recommendations.

The proposed amendment to this standard is:

- Management Direction: Manage All Known Sites (Survey and Manage ROD, Standards and Guidelines Page 8). Current and future known sites will be managed according to the Management Recommendation for the species, **with the exception of the operational right-of-way and the construction zone for the Pacific Connector Pipeline, for which the applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented.** Professional judgment, Appendix J2 in the Northwest Forest Plan Final SEIS, and appropriate literature will be used to guide individual site management for those species that do not have Management Recommendations. (Proposed amendment FS-1 on the Winema NF)

While the amendment would provide an exception to meeting this standard, there would also be requirements to do what is appropriate, applicable and feasible to minimize, maintain or restore any effects of the pipeline's construction and operation on Survey and Manage species within the area affected by the pipeline. Consequently, each amended standard includes the requirement that the "applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented".

The purpose of this project-level amendment is to make the proposed Pacific Connector pipeline project consistent with the Winema NF LRMP. Thus, the substantive planning rule requirements that are directly related to this amendment are:

- 36 CFR 219.9(a)(2)(ii) – [the plan must include plan components to maintain or restore] "Rare aquatic and terrestrial plant and animal communities."
- 36 CFR 219.9(b)(1) – "The responsible official shall determine whether or not the plan components required by paragraph (a) provide ecological conditions necessary to: …maintain viable populations of each species of conservation concern within the plan area."

Because the proposed amendment is "directly related" to these two substantive requirements, the Responsible Official must apply the requirements within the scope and scale of the proposed amendment (36 CFR 219.13 (b)(5)).

In considering the "scope and scale" of the amendment, it is important to recognize that the applicable sections of 36 CFR 219.9(a) and (b) that are described above, requires plan components to maintain or restore rare aquatic and terrestrial plant and animal communities, across the entire planning area (i.e., the Winema NF). This plan amendment does not alter these LRMP plan requirements for managing rare plant and animal communities across 99.99% of the Winema NF. The proposed pipeline construction corridor including the TEWAs and the UCSAs is approximately 92 acres of the 1,043,547 acre Winema NF. Within this 92 acre construction corridor surveys have identified 40 Survey and Manage sites that could be potentially impacted by construction activities. The proposed amendment does not waive the persistence objective for Survey and Manage species. The analysis that was conducted (see section 4.6.4.3 of the FEIS and Appendix F.5) determined the Survey and Manage persistence objectives would be met. This means that for Winema NF lands within the project area, individual sites of Survey and Manage species may be impacted or lost to construction activities, but affected species are expected to persist within the range of the NSO despite the loss of these individual sites.

The amendment modifies this standard so that in the 92 acres of the project construction area the project need not be in compliance with this standard' specific requirements but instead, it is the "applicable mitigation measures identified in the POD and the Pacific Connector Project design requirements" that must be implemented. Or stated in another way, for the 92 acres of National Forest lands that would be within the operational right-of-way and construction zone for the Pacific Connector Pipeline, the management requirement described above would be replaced with the full set of management requirements that comprise the "applicable mitigation measures identified in the POD and Pacific Connector Project Design requirements". The inclusion of these management requirements as a part of the plan component language for the LRMP in this plan amendment, addresses the applicable 36 CFR 219.9(a) and (b) rule requirements within the “scope and scale” of the proposed plan amendments. The sections below describe in more detail how the applicable 36 CFR 219.9(a) and (b) requirements are being addressed.

How the Required Mitigation Measures would Maintain or Restore Effects to Rare Aquatic and Terrestrial Plant and Animal Communities and Meet the Applicable 36 CFR 219.9(a) and 36 CFR 219.9 (b) Requirements

The Forest Service has worked to inventory, analyze, and evaluate rare aquatic, terrestrial plant and animal communities that could be affected by this project. In addition, a third-party consultant for technical support was also utilized in reviewing the information gathered for the project. The POD is a document developed between the FS, BLM, FERC, and PCGP that contains the design features, mitigation measures, roles and responsibilities, monitoring, and procedures for the construction and operation of the pipeline on NFS lands. In addition, FERC’s applicant prepared Plan and Procedures for construction and restoration enforceable, where applicable, for additional design features and mitigation. The design requirements and mitigation measures of the POD would be required by the modified standards and incorporated into BLM’s ROW grant.

The mitigation measures incorporated into amendments for Survey and Manage species are designed to minimize, maintain or restore the potential for habitat fragmentation, edge effects, and loss of long-term habitats associated with effected species. To ensure adequate restoration and revegetation of the ROW, design features are identified in the *Erosion Control and Revegetation Plan* (POD I), *Right-of-Way Clearing Plan* (POD U), *Leave Tree Protection Plan* (POD P). In addition, routing considerations were identified during project development to ensure avoidance of known populations of rare plant and animal communities (See Chapter 3.4.2, FEIS Route Variations, as well as, Appendix F.5, *Survey and Manage Persistence Evaluations*).

As a basis for Survey and Manage determinations, Appendix F.5 provides background research on Survey and Manage species that could be affected by the PCGP Project; a review of survey reports prepared by others for the PCGP Project; and processing and analysis of spatial data obtained from the Bureau of Land Management (BLM), Forest Service, and other sources over the past 12 years. Background information was used in combination with new information available as a result of surveys for the PCGP Project and recent surveys in other portions of old growth forests to discuss the currently known distribution of the species in old growth forests within the NSO range. Impacts to sites as a result of the PCGP Project were analyzed to determine if the species would continue to have a reasonable assurance of persistence in the NSO range following implementation of the PCGP Project, taking into consideration the status and distribution of the species and general habitat in the NSO range.

Some of the required mitigation measures in the POD sections to protect rare plant and animal communities include: flagging existing snags on the edges of the construction right-of-way or TEWAs where feasible to save from clearing; snags would be saved as and used in LWD placement post-construction to benefit primary and secondary cavity nesting birds, mammals, reptiles, and amphibians; other large diameter trees on the edges of the construction right-of-way and TEWAs would also be flagged to save/protect as green recruitment or habitat/shade trees, where feasible; trees would be girdled to create snags to augment the number of snags along the right-of-way to benefit cavity nesting birds, mammals, reptiles, and amphibians. See POD’s P &

U and section 2.6.3 --Monitoring by Land Managing Agencies on Federal Lands of the FEIS for a complete list of applicable mitigation measures for pipeline construction. Additional measures include low ground weight (pressure) vehicles would be used; logging machinery would be restricted to the 30-foot permanent right-of-way wherever possible to prevent soil compaction; the removal of soil duff layers would be avoided in order to maintain a cushion between the soil and the logs and the logging equipment; designed skid trails would be used to restrict detrimental soil disturbance (compaction and displacement) to a smaller area of the right-of-way over the pipeline trenching area; and the temporary construction area would be restored and revegetated using native seeds, to the extent possible, and saplings (POD I).

In an effort to minimize, maintain or restore the impacts to Survey and Manage species, PCGP adopted route variations to avoid certain species identified in the Survey and Manage Persistence Evaluations by co-locating the proposed construction corridor adjacent to existing roads, through managed timber stands or otherwise avoid unique LSOG habitats to the maximum extent practicable (See Chapter 3.4.2, FEIS).

During construction of the Project, Compliance Monitors representing FERC are present on a full-time basis to inspect construction procedures and mitigation measures and provide regular feedback on compliance issues to FERC and the Forest Service. Objectives of the Compliance Monitoring program are to facilitate the timely resolution of compliance issues in the field; provide continuous information to FERC regarding noncompliance issues and their resolution; and review, process, and track construction-related variance requests. Changes to previously approved mitigation measures, construction procedures, and construction work areas due to unforeseen or unavoidable site conditions would require various levels of regulatory approval from the applicable land management agencies. FERC would have the authority to stop any activity that violates an environmental condition of the FERC authorization issued to PCGP.

Additionally, environmental compliance oversight responsibilities for PCGP, FERC, FS and BLM are described in the POD (Environmental Briefings and Compliance Plan, POD G) that would apply to the construction, operation, and maintenance of the project specifically on NFS lands. The FS Authorized Officer would coordinate with the BLM in administering and enforcing ROW grant provisions and would have stop-work authority. The FS Authorized Officer's designated representatives would ensure that the stipulations and mitigation measures included in the POD that are designed to minimize, maintain or restore the effects to soil, water and riparian resources, are adhered to during project construction, operation, and maintenance. The BLM Authorized Officer would coordinate with the FS to ensure the work is being conducted in accordance with the ROW grant and agreed upon conditions. BLM and the FS would have stop-work authority. Field variance requests would be coordinated with the Authorized Officers.

How the Compensatory Mitigation Actions would help to Maintain or Restore Rare Aquatic and Terrestrial Plant and Animal Communities in the Plan Area (36 CFR 219.9(a), 36 CFR 219.9 (b)).

The CMP on the Winema NF includes proposals to improve aquatic and riparian habitat that would benefit rare aquatic plant and animal communities (see the discussion of *How the Compensatory Mitigation Actions would help to Maintain or Restore the Ecological Integrity of The Soils and Soil Productivity, including guidance to reduce soil erosion and sedimentation in*

<u>*the Plan Area (36 CFR 219.8(a)(2)(ii))*</u> below for a discussion of benefits to aquatic habitats). The CMP also includes proposals to decommission approximately 29.2 miles of road.

Although the Pacific Connector project has been routed to avoid LSOG habitat as much as possible and is aligned along existing roads, the project would still cause some habitat fragmentation. Road decommissioning reduces the edge effects over time by revegetating road surfaces and eliminating road corridors. Revegetating selected roads could create larger blocks of late successional habitat in the future.

These projects have been designed by an interdisciplinary team of resource professionals on the Winema NF with input and coordination with the U.S. Fish and Wildlife Service, NOAA Fisheries, and State agencies. They were planned within the watersheds that would be affected by the Pacific Connector pipeline project. They are a component of the PCGP application and would be a requirement of the Right-of-Way grant. Overall, these projects would help maintain and restore rare aquatic and terrestrial plant and animal communities on the Winema NF (see tables 2.3.1-3 and 2.3.1-4 and figures 2.3-1 and 2.3-2 for additional information).

2.3.1.2 Forest Plan Amendments Related to Soil, Water and Riparian Areas (WNF -4, WNF-5):

Two Forest Plan standards associated with the soil, water, and riparian resources would need to be modified so that the proposed construction and operation of the Pacific Connector pipeline can be in compliance with the Winema NF LRMP. These standards are:

- Detrimental Soils Conditions, Standard and guideline 12-5, (WNF LRMP, 4-73). The cumulative effects of detrimental soil conditions should not exceed 20 percent of the total acreage within the activity area: any reason for exceeding the limitation shall be documented in an environmental assessment. Detrimental soil conditions include compaction, displacement, puddling, and moderately or severely burned soil from all activities (including roads, skid trails, and landings). Sites where the standards for displacement, puddling, and compaction are not currently met will require rehabilitation such as ripping, backblading, or fertilization. The potential for creating detrimental soil conditions will be specifically addressed through project environmental analyses. If needed, alternative management practices will be developed, and mitigating measures will be planned and implemented.
- Soil and Water, Standard & Guideline 3 (WNF LRMP 4-137). The cumulative total area of detrimental soil conditions in riparian areas shall not exceed 10 percent of the total riparian acreage within an activity area. Detrimental soil conditions include compaction, displacement, puddling, and moderately or severely burned soil.

The proposed amendments to these standards are:

- Detrimental Soils Conditions, Standard and guideline 12-5, (WNF LRMP, 4-73). The cumulative effects of detrimental soil conditions should not exceed 20 percent of the total acreage within the activity area: any reason for exceeding the limitation shall be documented in an environmental assessment, **with the exception of the operational right-of-way and the construction zone for the Pacific Connector Pipeline, for which the applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented**. Detrimental soil conditions include compaction, displacement, puddling, and moderately or severely burned soil from all activities (including roads, skid trails, and landings). Sites where the standards for displacement, puddling, and compaction are not currently met will require rehabilitation such as ripping, backblading, or fertilization. The potential for creating detrimental soil conditions will be specifically addressed through project environmental analyses. If needed, alternative management practices will be developed, and mitigating measures will be planned and implemented. (Proposed amendment WNF-4)

- Soil and Water, Standard & Guideline 3 (WNF LRMP 4-137). The cumulative total area of detrimental soil conditions in riparian areas shall not exceed 10 percent of the total riparian acreage within an activity area, **with the exception of the operational right-of-way and the construction zone for the Pacific Connector Pipeline, for which the applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented.** Permanent recreation facilities or other permanent facilities are exempt. (Proposed amendment WNF-5)

While the amendments would provide an exception to meeting these standards, there would also be requirements to do what is appropriate, applicable and feasible to minimize, maintain or restore any effects of the pipeline's construction and operation on the soil, water and riparian resources within the area affected by the pipeline. Consequently, each amended standard includes the requirement that the "applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented".

The purpose of these two project-level amendments is to make the proposed Pacific Connector pipeline project consistent with the Winema NF LRMP. Thus, the substantive planning rule requirements that are directly related to these two amendments are:

- 36 CFR 219.8(a)(2)(ii) – [The plan must include plan components to maintain or restore] "soils and soil productivity, including guidance to reduce soil erosion and sedimentation."

Because the two proposed amendments are "directly related" to this substantive requirement, the Responsible Official must apply the requirements within the scope and scale of the proposed amendments (36 CFR 219.13 (b)(5)).

In considering the "scope and scale" of the two amendments, it is important to recognize that the applicable sections of 36 CFR 219.8(a) that are described above, requires plan components to "maintain or restore" the soil resources across the entire planning area (i.e., the Winema NF). These plan amendments do not alter these LRMP plan requirements for managing the soil resources across 99.99% of the Winema NF. The proposed pipeline construction corridor including the TEWAs and the UCSAs is approximately 92 acres of the 1,043,547 acre Winema NF. Of the 92 acres of pipeline corridor construction it is estimated that approximately 27 to 62 acres would not meet standards for soils described above.

The amendment modifies 2 standards so that in the 92 acres of the project construction area the project need not be in compliance with these standards' specific requirements but instead, it is the "applicable mitigation measures identified in the POD and the Pacific Connector Project design requirements" that must be implemented. Or stated in another way, for the 92 acres of National Forest lands that would be within the operational right-of-way and construction zone for the Pacific Connector Pipeline, the two management requirements described above would be replaced with the full set of management requirements that comprise the "applicable mitigation measures identified in the POD and Pacific Connector Project Design requirements". The inclusion of these management requirements as a part of the plan component language for the LRMP in this plan amendment, addresses the applicable 36 CFR 219.8(a) rule requirements within the "scope and scale" of these proposed plan amendments. The sections below describe in more detail how the applicable 36 CFR 219.8(a) requirements are being addressed.

How the Required Mitigation Measures would Maintain or Restore Effects to Soil, Water, and Riparian Resources and Meet the Applicable 36 CFR 219.8(a) Requirements.

The Forest Service has worked with Pacific Connector Gas Pipeline (PCGP) to inventory, analyze, and evaluate the geologic, soil, and hydrologic resources that could be affected by this project. In addition, a third-party consultant for technical support was also utilized in reviewing the information gathered for the project. The POD is a document developed between the FS, BLM, FERC, and PCGP that contains the design features, mitigation measures, roles and responsibilities, monitoring, and procedures for the construction and operation of the pipeline on NFS lands. In addition, FERC's applicant prepared Plan and Procedures for construction and restoration are enforceable, where applicable, for additional design features and mitigation. The design requirements and mitigation measures of the POD would be required by the modified standards and incorporated into BLM's ROW grant.

The mitigation measures, incorporated into amendments for soil, water, and riparian resources are designed to minimize, maintain or restore the potential for soil movement, slope stability, water quality, and to ensure adequate restoration and revegetation. These measures are identified in: the *Erosion Control and Revegetation Plan* (POD I); *Right-of-Way Clearing Plan* (POD U); *Wetland and Waterbody Crossing Plan* (POD BB); the *Forest Service Site Specific Stream Crossing Prescriptions* (NSR 2014); the *Stream Crossing Risk Analysis*; and *Stream Crossing Risk Analysis Addendum* (GeoEngineers2017d, 2018a). PCGP would also follow the FERC's applicant prepared Wetland Procedures and the Best Management Practices for the State of Oregon. To further reduce potential for landslides on steep slopes, the Forest Service, BLM, and FERC are also recommending additional industry best management practices and measures identified from the *Technical Report on Soil Risk and Sensitivity Assessment* (NSR 2014) be incorporated into PCGP's terms and conditions of the Right-of-Way Grant as described in the POD's identified above. See 4.2.3.3 of the FEIS for a description of soil risk and sensitivity assessment.

Areas with soils rated moderate to very high for risk or sensitivity (28 acres total) would be recommended for more site-specific validation of the risk criteria used in the *Technical Report on Soil Risk and Sensitivity Assessment* (NSR 2014) to confirm that specific locations merit consideration of the more aggressive soil remediation measures, such as: a 2- to 3-inch organic mulch surface application (80 percent coverage) of woodchips, logging slash, and/or straw; adaptive seed mixes and vegetation to better fit site conditions; deep subsoil decompaction with hydraulic excavators that leave constructed corridor mounded and rough with maximum water infiltration so that water cannot flow downhill for any appreciable distance; more aggressive use of constructed surface water runoff dispersion structures such as closely placed and more pronounced slope dips and water bars, etc.; more aggressive use of constructed surface runoff entrapments such as silt fencing, sediment settling basins, or straw bale structures, etc.; more aggressive placement (100 percent coverage) and depth (3 to 4 inches) of ground cover using woodchips, logging slash, straw bales, wattles (see POD's U and I). In efforts to protect soil productivity, topsoil segregation would be required for pipeline construction at wetland and waterbody crossings on NFS lands (POD U).

Some of the required mitigation measures in the POD BB and *Forest Service Site Specific Stream Crossing Prescriptions* (NSR 2014) to protect wetlands and minimize, maintain or restore compaction include: limiting the construction right-of-way width to 75 feet through wetlands; placing equipment on mats; using low-pressure ground equipment; limiting equipment operation and construction traffic along the right-of-way; locating temporary workspace (TEWAS) more than 50 feet away from wetland boundaries; cutting vegetation at ground level; limiting stump removal to the construction trench; segregating the top 12 inches of soil, or to the depth of the topsoil horizon; using "push-pull" techniques in saturated wetlands; limiting the amount of time that the trench is open by not trenching until the pipe is assembled and ready for installation; not using imported rock and soils for backfill; and not using fertilizer, lime, or mulch during restoration in wetlands. PCGP must also follow the FERC Waterbody and Wetland Construction and Mitigation Procedures. See 4.3.3.2 of the FEIS for a complete list of applicable mitigation measures for pipeline construction at specific waterbody and stream crossings.

In an effort to minimize, maintain or restore the impacts to streams and riparian areas, PCGP adopted route variations to co-locate the proposed construction corridor adjacent to existing roads and along dry ridge tops (See Chapter 3.4.2, FEIS). In addition, PCGP has committed to limit construction at waterbody crossings to times of dry weather or low water flow. PCGP would implement the required erosion control measures at the proposed stream crossings to minimize, maintain or restore potential erosion and sedimentation impacts. The applicable mitigation measures and monitoring requirements in the POD relating to water waterbody crossings are included in the *Site Specific Forest Service Stream Crossing Prescriptions, and Wetland and Waterbody Crossing Plan* (POD BB). In addition, applicable mitigation measures from the FERC approved applicant prepared Procedures for Wetland and Waterbody Crossings would be required.

During construction of the Project, Compliance Monitors representing FERC are present on a full-time basis to inspect construction procedures and mitigation measures and provide regular feedback on compliance issues to FERC and the Forest Service. Objectives of the Compliance Monitoring program are to: facilitate the timely resolution of compliance issues in the field; provide continuous information to FERC regarding noncompliance issues and their resolution; and review, process, and track construction-related variance requests. Changes to previously approved mitigation measures, construction procedures, and construction work areas due to unforeseen or unavoidable site conditions would require various levels of regulatory approval from the applicable land management agencies. FERC would have the authority to stop any activity that violates an environmental condition of the FERC authorization issued to PCGP.

Additionally, environmental compliance oversight responsibilities for PCGP, FERC, FS and BLM are described in the POD (Environmental Briefings and Compliance Plan, POD G) that would apply to the construction, operation, and maintenance of the project specifically on NFS lands. The FS Authorized Officer would coordinate with the BLM in administering and enforcing ROW grant provisions and would have stop-work authority. The FS Authorized Officer's designated representatives would ensure that the stipulations and mitigation measures included in the POD that are designed to minimize, maintain or restore the effects to soil, water and riparian resources, are adhered to during project construction, operation, and maintenance. The BLM Authorized Officer would coordinate with the FS to ensure the work is being conducted in accordance with the ROW grant and agreed upon conditions. BLM and the FS would have stop-work authority. Field variance requests would be coordinated with the Authorized Officers.

How the Compensatory Mitigation Actions would help to Maintain or Restore the Ecological Integrity of The Soils and Soil Productivity, including guidance to reduce soil erosion and sedimentation in the Plan Area (36 CFR 219.8(a)(2)(ii)).

Part of the CMP on the Winema NF includes proposals to place large woody debris in-stream for 1.0 miles, repair stream crossings at 25 sites, provide Riparian Planting for 0.5 miles, provide Riparian Fencing for 6.5 miles, and decommission approximately 29.2 miles of road.

Placement of LWD in streams adds structural complexity to aquatic systems by creating pools and riffles, trapping fine sediments and can contribute to reductions in stream temperatures over time (Tippery et al. 2010). Placing LWD in streams affects channel morphology, the routing and storage of water and sediment, and provides structure and complexity to stream systems. Complex pools and side channels created by instream wood provide overwintering habitat to stream salmonids and other aquatic organisms (Solazzi et. al. 2000). They also provide cover from predators during summer low flow periods when predation is at its highest. Providing more stream channel structure results in better over wintering habitat, improved summer pool habitat, and more abundant spawning gravels.

Riparian planting is proposed along Spencer Creek just upstream of Buck Lake. This is a meadow site that has lost streamside vegetation and has compacted soils. There is an overall need to restore health and vigor to riparian stands by maintaining and improving riparian reserve habitat. Shade provided by the plantings would contribute to moderating water temperatures in Spencer Creek. Root strength provided by new vegetation would increase bank stability, decrease erosion and sediment depositions to Spencer Creek and provide habitat for species that use riparian habitats. Riparian fencing would serve to divide the Buck Indian Allotment into pastures north and south at Clover Creek Road. This fence would keep cattle from grazing newly revegetated areas in the construction corridor, including areas where the corridor crosses Spencer Creek, thus helping to ensure that erosion control and revegetation objectives are met. It would also serve to separate anticipated increased cattle grazing of the construction corridor from the highway; greatly reducing a safety hazard for vehicles traveling the Clover Creek road.

Restoring stream crossings reconnects aquatic habitats by allowing the passage of aquatic biota and restoring riparian vegetation. Over time, these actions reduce sediment and restore shade. Restoration of these crossings includes riparian planting as a mitigation which would help offset the impact of shade removal at pipeline crossings. The proposed pipeline would cross Spencer Creek upstream of Buck Lake. It is occupied by redband trout. Spencer Creek has been identified by NMFS as habitat for federally listed Southern Oregon/Northern California Coast Coho salmon. Additionally, once fish passage is provided through the Klamath River hydro facilities, steelhead would re-colonize Spencer Creek. Improving habitat quality at Spencer Creek provides the opportunity to be pro-active in providing quality habitat for SONC Coho, mitigating for any detrimental effects to other SONC Coho habitats, while improving habitat for redband trout and other aquatic species. Spencer Creek appears on the Oregon DEQ 303(d) list as water quality impaired from increased sedimentation. Improvements at this location would immediately benefit all downstream aquatic habitats and the species associated with those habitats.

Decommissioning roads can substantially reduce sediment delivery to streams (Madej 2000; Keppeler et al. 2007). Proposed road decommissioning and stormproofing would increase infiltration of precipitation, reduce surface runoff, and reduce sediment production from road-related surface erosion in the watershed where the impacts from the Project would occur. Decommissioning roads would restore natural drainage patterns and thereby avoid large volumes of added sediment to the stream network that would be likely to eventually occur. In addition limited road maintenance dollars could be focused on the remaining road systems resulting in more maintenance of culverts and ditchlines resulting in less potential for catastrophic failure. Madej (2000) concluded that by eliminating the risk of stream diversions and culvert failures, road removal treatments significantly reduce long-term sediment production from retired logging roads.

These projects have been designed by an interdisciplinary team of resource professionals on the Winema NF with input and coordination with the U.S. Fish and Wildlife Service, NOAA Fisheries, and State agencies. These projects have been planned within the watersheds that would be affected by the Pacific Connector pipeline project. These projects have been proposed by the Applicant as part of their application and would be a requirement of the Right-of-Way grant. These projects would help maintain and restore soil resources including reducing soil erosion and sedimentation on the Winema NF (see tables 2.3.1-3 and 2.3.1-4 and figures 2.3-1 and 2.3-2 for additional information).

2.3.1.3 Forest Plan Amendments Related Visual Resources (WNF -1, WNF-2, WNF-3):

Three Forest Plan standards associated with visual resources would need to be modified so that the proposed construction and operation of the Pacific Connector pipeline can be in compliance with the Winema NF LRMP. These standards are:

- Management Area 3, Lands, Standard and Guideline (4), (WNF LRMP 4-103). This management area is an avoidance area for new transportation and utility corridors.
- Management Area 3A, Foreground Retention, Standard and Guideline Scenic (1), (WNF LRMP 4-103 and 104). Evidence of management activities from projects that produce slash (tree harvest) or charred bark (underburning) will not be noticeable one year after the work has been completed.
- Management 3B, Foreground Partial Retention, Standard and Guideline Scenic (1), (WNF LRMP, 4-107). Evidence of management activities from projects that produce slash (tree harvest) or charred bark (underburning) should not be noticeable from two to three years after the work has been completed.

The proposed amendments to these standards are:

- Management Area 3, Lands, Standard and Guideline (4), (WNF LRMP 4-103). This management area is an avoidance area for new transportation and utility corridors**, with the exception of the Pacific Connector Pipeline right-of-way. The applicable**

mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented. (Proposed amendment WNF-1)

- Management Area 3A, Foreground Retention, Standard and Guideline Scenic (1), (WNF LRMP 4-103 and 104). Evidence of management activities from projects that produce slash (tree harvest) or charred bark (underburning) will not be noticeable one year after the work has been completed, **with the exception of the Pacific Connector Pipeline right-of-way which shall attain the VQO within 10 - 15 years after completion of the construction phase of the project where the pipeline crosses Management area 3A. The applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented.** (Proposed amendment WNF-2)
- Management 3B, Foreground Partial Retention, Standard and Guideline Scenic (1), (WNF LRMP, 4-107). Evidence of management activities from projects that produce slash (tree harvest) or charred bark (underburning) should not be noticeable from two to three years after the work has been completed, **with the exception of the Pacific Connector Pipeline right-of-way, which shall attain the VQO within 10 - 15 years after completion of the construction phase of the project where the pipeline crosses Management area 3B. The applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented.** (proposed amendment WNF-3)

While the amendments would provide an exception to meeting these standards, there would also be requirements to do what is appropriate, applicable and feasible to minimize, maintain or restore any effects of the pipeline's construction and operation on the visual resources within the area affected by the pipeline. Consequently, each amended standard includes the requirement that the "applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented".

The purpose of these three project-level amendments is to make the proposed Pacific Connector pipeline project consistent with the Winema NF LRMP. Thus, the substantive planning rule requirements that are directly related to these three amendments are:

- 36 CFR 219.10(a)(1) – […the responsible official shall consider: …] "(1) Aesthetic values,… scenery,... viewsheds...".
- 36 CFR 219.10(b)(i) – [the responsible official shall consider] "Sustainable recreation; including recreation settings, opportunities,…and scenic character…"

Because the proposed amendments are "directly related" to these two substantive requirements, the Responsible Official must apply the requirements within the scope and scale of the proposed amendments (36 CFR 219.13 (b)(5)).

In considering the "scope and scale" of the three amendments, it is important to recognize that the applicable sections of 36 CFR 219.10 that are described above, requires plan components to provide for aesthetic values and scenic character across the entire planning area (i.e., Winema NF). These plan amendments do not alter these LRMP plan requirements for managing visual resources across 99.99% of the Winema NF. The proposed pipeline construction corridor including the TEWAs and the UCSAs is approximately 92 acres of the 1,043,547 acre Winema

NF. Of the 92 acres of pipeline corridor construction it is estimated that approximately 70 of these acres would not meet the standards for visual resources described above.

The amendments modify three standards so that in the 92 acres of the project construction area the project need not be in compliance with these standards' specific requirements but instead, it is the "applicable mitigation measures identified in the POD and the Pacific Connector Project design requirements" that must be implemented. Or stated in another way, for the 92 acres of National Forest lands that would be within the operational right-of-way and construction zone for the Pacific Connector Pipeline, the three management requirements described above would be replaced with the full set of management requirements that comprise the "applicable mitigation measures identified in the POD and Pacific Connector Project Design requirements". The inclusion of these management requirements as a part of the plan component language for the LRMP in this plan amendment, addresses the applicable 36 CFR 219.10 rule requirements within the "scope and scale" of these proposed plan amendments. The sections below describe in more detail how the applicable 36 CFR 219.10 requirements are being addressed.

How the Required Mitigation Measures would Consider, Minimize, Maintain or Restore Effects to Aesthetic Values and Scenic Character and Meet the Applicable 36 CFR 219.10(a) and 36 CFR 219.10(b)Requirements.

The Forest Service has worked to inventory, analyze, and evaluate visual resources, view sheds, and aesthetics that could be affected by this project. Forest Service landscape architect provided technical support to FERC and Forest Service third-party contractors by reviewing the information gathered for the project. The POD is a document developed between the FS, BLM, FERC, and PCGP that contains the design features, mitigation measures, roles and responsibilities, monitoring, and procedures for the construction and operation of the pipeline on NFS lands. In addition, FERC's applicant prepared Plan and Procedures for construction and restoration enforceable, where applicable, for additional design features and mitigation. The design requirements and mitigation measures of the POD would be required by the modified standards and incorporated into BLM's ROW grant.

The mitigation measures incorporated into amendments for Visual Quality Objectives, are designed to minimize, maintain or restore the potential for long-term impacts to visually sensitive areas. To ensure adequate restoration and revegetation of the ROW, design features are identified in the *Erosion Control and Revegetation Plan* (POD I), *Right-of-Way Clearing Plan* (POD U), *Leave Tree Protection Plan* (POD P), *Aesthetics Management Plan* (POD A), and *Recreation Management Plan* (POD S).

A visual assessment was conducted to determine the potential effects on visual resources associated with the pipeline. Representative viewpoint points (also referred to as KOPs) were identified within the view shed for the pipeline, defined as the area from which the pipeline would be potentially visible. Photographs of existing visual conditions were used in preparing computerized visual simulations for each KOP. Because the appearance of the pipeline right-of-way would change with time, a series of simulations were prepared to illustrate how the pipeline right-of-way would look at different timeframes following construction. These KOPs would also serve as monitoring points for mitigation.

Pacific Connector produced POD A that outlined measures to reduce visual impacts along its pipeline route. To the extent feasible, PCGP would use revegetation efforts to shape and blend the pipeline easement, enhance the setting, and mimic the natural features of the landscape. These measures would consist of revegetating all disturbed areas and replanting trees in TEWAs and any other areas of the temporary construction right-of-way that were forested prior to construction (see POD I).

On Forest Service lands, PCGP would maintain a cleared 30-foot width centered over the pipe allowing the remainder of the permanent easement to be reforested. This allows trees to naturally reestablish along the edges of the permanent easement at a staggered, more natural-looking interval. Replacing slash in forested areas of the right-of-way during restoration activities would immediately affect the visual contrast in color and texture of the disturbed right-of-way areas. Over time, as the right-of-way revegetates and narrows in width and changes in form, texture and color, potential visual impacts would diminish.

Additionally, a row, or if necessary, clusters of trees and/or shrubs would be planted across the right-of-way to provide visual screens at key road and trail crossings in sensitive view sheds. For all revegetation practices, PCGP and/or its contractors would only use agency-approved tree and plant species, in compliance with management plan objectives and in consultation with agency specialists.

Site Specific Crossing Prescriptions:

Clover Creek Road (intersection of Dead Indian Memorial Highway and Clover Creek Road). Viewsheds in this area are managed for Foreground and Middleground Retention and Partial Retention, but also contain areas of private lands with recently harvested timber and several clusters of rural residential homes. The proposed alignment would cross the Dead Indian Memorial Highway perpendicularly in a thick forest foreground setting (at MP 168.83). PCGP would implement the mitigation recommendations detailed in Section 3.2 and 3.3 and further described in the POD I. These pipeline restoration efforts would include regrading to the approximate original contours, reseeding, scattering slash across the right-of-way, and replanting, which would minimize, maintain or restore visual contrast of the right-of-way. During restoration, PCGP would plant trees within forested areas to within 15 feet of the Pipeline, which would allow a strip of trees to establish along the easement and between the Pipeline and the road in this area. Because the Pipeline was recommended to abut the road and to eliminate the strip of trees between the road and the Pipeline easement, the Forest Service and BLM would specify if tree planting would occur on federal lands between the centerline and Clover Creek Road (but not within 15 feet of the pipeline). PCGP would also implement the mitigation recommendations in the Federal Lands Scenery Management Analysis at this location which include:

During construction of the Project, Compliance Monitors representing FERC are present on a full-time basis to inspect construction procedures and mitigation measures and provide regular feedback on compliance issues to FERC and the Forest Service. Objectives of the Compliance Monitoring program are to: facilitate the timely resolution of compliance issues in the field; provide continuous information to FERC regarding noncompliance issues and their resolution; and review, process, and track construction-related variance requests. Changes to previously approved mitigation measures, construction procedures, and construction work areas due to unforeseen or unavoidable site conditions would require various levels of regulatory approval from the applicable land management agencies. FERC would have the authority to stop any activity that violates an environmental condition of the FERC authorization issued to PCGP.

Additionally, environmental compliance oversight responsibilities for PCGP, FERC, FS and BLM are described in the POD (*Environmental Briefings and Compliance Plan*, POD G) that would apply to the construction, operation, and maintenance of the project specifically on NFS lands. The FS Authorized Officer would coordinate with the BLM in administering and enforcing ROW grant provisions and would have stop-work authority. The FS Authorized Officer's designated representatives would ensure that the stipulations and mitigation measures included in the POD that are designed to minimize, maintain or restore the effects to visual resources and recreational resources are adhered to during project construction, operation, and maintenance. The BLM Authorized Officer would coordinate with the FS to ensure the work is being conducted in accordance with the ROW grant and agreed upon conditions. BLM and the FS would have stop-work authority. Field variance requests would be coordinated with the Authorized Officers.

How the Compensatory Mitigation Actions would help to Provide for Aesthetic Values and Scenic Character in the Plan Area (36 CFR 219.10(a)(1), 36 CFR 219.10(b)(i)).

Part of the CMP on the Winema NF includes a proposal to reduce stand densities on 114 acres in a way that would help soften the visual impact of the Pacific Connector Project.

The Pacific Connector pipeline would create a hard line along the timbered edge of the corridor that does not fit with the visual objectives for the Clover Creek Road or the Dead Indian Memorial Highway. Thinning and fuels treatments can be used to soften the edge to a more natural appearing texture by restoring stand density to more natural levels and creating small openings that are consistent with the landscape. This proposal would restore stand density, species diversity, and structural diversity more characteristic under a natural disturbance regime.

This project has been designed by an interdisciplinary team of resource professionals on the Winema NF with input and coordination with the U.S. Fish and Wildlife Service, NOAA Fisheries, and State agencies. It was planned within the watersheds that would be affected by the Pacific Connector pipeline project. It is a component of the PCGP application and would be a requirement of the Right-of-Way grant. This project would help to restore visual resources on the Winema NF (see tables 2.3.1-3 and 2.3.1-4 and figures 2.3-1 and 2.3-2 for additional information).

TABLE 2.3.1-1

Proposed LRMP Amendments on the Winema NF

Amendment	**Description**	**Text of Proposed Amendment**	**Related Planning Rule Requirements**	**Pacific Connector pipeline Impacts**	**Project Design Features**	**Compensatory Mitigation**[13]
FS-1: Project-Specific Amendment to Exempt Management Recommendations for Survey and Manage Species on the Winema NF.	The Winema River NF LRMP (WNF LRMP 1990) would be amended to exempt certain known sites within the area of the proposed Pacific Connector right-of-way grant from the Management Recommendations required by the 2001 “Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (Survey and Manage ROD). For known sites within the proposed right-of-way that cannot be avoided, the 2001 Management Recommendations for protection of known sites of Survey and Manage species would not apply. For known sites located outside the proposed right-of-way but with an overlapping protection buffer only that portion of the buffer within the right-of-way would be exempt from the protection requirements of the Management Recommendations. Those Management Recommendations would remain in effect for that portion of the protection buffer that is outside of the right of way. The proposed amendment would not exempt the Forest Service from the requirements of the Survey and Manage ROD, as modified, to maintain species persistence for affected Survey and Manage species within the range of the northern spotted owl. This is a project-specific plan amendment applicable only to the Pacific Connector Pipeline Project and would not change future management direction for any other project. The amendment would provide an exception from these standards for the Pacific Connector Project and include specific mitigation measures and project design requirements for the project.	Management Direction: Manage All Known Sites (Survey and Manage ROD, Standards and Guidelines Page 8). Current and future known sites will be managed according to the Management Recommendation for the species, **with the exception of the operational right-of-way and the construction zone for the Pacific Connector Pipeline, for which the applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented.** Professional judgment, Appendix J2 in the Northwest Forest Plan Final SEIS, and appropriate literature will be used to guide individual site management for those species that do not have Management Recommendations.	The 36 CFR 219 planning rule requirements that are directly related to this amendment include: § 219.9(a)(2)(ii) – [the plan must include plan components to maintain or restore] “Rare aquatic and terrestrial plant and animal communities.” § 219.9(b)(1) – “The responsible official shall determine whether or not the plan components required by paragraph (a) provide ecological conditions necessary to: …maintain viable populations of each species of conservation concern within the plan area.”	28 acres of late successional and old growth (LSOG) habitat directly impacted from construction activity[14] 92 total acres directly impacted from construction activity 40 survey and manage sites potentially impacted from pipeline construction This amendment would affect less than 0.01% of the Winema NF	POD (I) Erosion Control and Revegetation Plan POD (J) Plant Conservation Plan POD (P) Leave Tree Protection Plan POD (U) Right-of-Way Clearing Plan Chapter 3, FEIS Route Design and Modifications on NFS lands Appendix F5, Survey and Manage Persistence Evaluations	Road Decommissioning – approximately 29.2 Miles LWD in-stream – 1.0 miles Riparian Planting – 0,5 miles Riparian Fencing – 6.5 miles Stream Crossing Repair – 25 sites
WNF-1: Project - Specific Amendment to Allow Pacific Connector Pipeline Project in Management Area 3 –	The Winema NF LRMP would be amended to change the Standards and Guidelines for Management Area 3 (MA-3) (LRMP page 4-103-4, Lands) to allow the 95-foot-wide Pacific Connector pipeline project in MA-3 from the Forest Boundary in Section 32, T.37S., R.5E.,	Management Area 3, Lands, Standard and Guideline (4), (WNF LRMP 4-103). This management area is an avoidance area for new transportation and utility	The 36 CFR 219 planning rule requirements that are directly related to this amendment include: § 219.10(a)(1) – [the responsible official shall consider] “Aesthetic values,…	Approximately 17 acres of MA-3 would be impacted This amendment would affect approximately 0.01% of	POD (A) Aesthetics Management Plan for Federal Lands POD (I) Erosion Control and	Clover Creek Visual Management – 114 acres

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[13] The compensatory mitigation listed in this column reflects the mitigation most related to the proposed amendment. It should be noted that other actions in the CMP may also be beneficial.

[14] Direct Impacts include acres cleared for construction in the construction corridor and temporary extra work areas (TEWA), as well as acres modified from uncleared storage areas (UCSA)

TABLE 2.3.1-1

Proposed LRMP Amendments on the Winema NF

Amendment	Description	Text of Proposed Amendment	Related Planning Rule Requirements	Pacific Connector pipeline Impacts	Project Design Features	Compensatory Mitigation[13]
Scenic Management:	W.M., OR, to the Clover Creek Road corridor in Section 4, T.38S, R.5. E., W.M., OR. Standards and Guidelines for MA-3 state that the area is currently an avoidance area for new utility corridors. This proposed Pacific Connector Pipeline Project is approximately 1.5 miles long and occupies approximately 17 acres within MA-3. The amendment would provide an exception from these standards for the Pacific Connector Pipeline Project and include specific mitigation measures and project design requirements. This is a project-specific plan amendment applicable only to the Pacific Connector Pipeline Project and would not change future management direction for any other project.	corridors**, with the exception of the Pacific Connector Pipeline right-of-way. The applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented.**	scenery,... viewsheds...". § 219.10(b)(i) – [the responsible official shall consider] "Sustainable recreation; including recreation settings, opportunities,…and scenic character…"	Management area 3 on the Winema NF	Revegetation Plan POD (P) Leave Tree Protection Plan POD (U) Right-of-Way Clearing Plan	
WNF-2: Project-Specific Amendment of VQO on the Dead Indian Memorial Highway:	The Winema NF LRMP would be amended to allow 10-15 years to achieve the VQO of Foreground Retention where the Pacific Connector right-of-way crosses the Dead Indian Memorial Highway at approximately pipeline MP 168.8 in Section 33, T.37S., R.5E., W. M., OR. Standards and Guidelines for Scenic Management, Foreground Retention (LRMP 4-103, MA 3A, Foreground Retention) requires VQOs for a given location be achieved within one year of completion of the project. The Forest Service proposes to allow 10-15 years to meet the specified VQO at this location. The amendment would provide an exception from these standards for the Pacific Connector Pipeline Project and include specific mitigation measures and project design requirements for the project. This is a project-specific plan amendment that would apply only to the Pacific Connector Pipeline Project in the vicinity of the Dead Indian Memorial Highway and would not change future management direction for any other project.	Management Area 3A, Foreground Retention, Standard and Guideline Scenic (1), (WNF LRMP 4-103 and 104). Evidence of management activities from projects that produce slash (tree harvest) or charred bark (underburning) will not be noticeable one year after the work has been completed, **with the exception of the Pacific Connector Pipeline right-of-way which shall attain the VQO within 10 - 15 years after completion of the construction phase of the project where the pipeline crosses Management area 3A. The applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented.**	The 36 CFR 219 planning rule requirements that are directly related to this amendment include: § 219.10(a)(1) – […the responsible official shall consider: …] "(1) Aesthetic values,… scenery,... viewsheds...". § 219.10(b)(i) – [the responsible official shall consider] "Sustainable recreation; including recreation settings, opportunities,… and scenic character…".	Approximately 3 acres would be impacted by the project This amendment would affect approximately 0.01% of Management area 3A on the Winema NF	POD (A) Aesthetics Management Plan for Federal Lands POD (I) Erosion Control and Revegetation Plan POD (P) Leave Tree Protection Plan POD (U) Right-of-Way Clearing Plan	Clover Creek Visual Management – 114 acres
WNF-3: Project - Specific Amendment of VQO Adjacent to the Clover Creek	The Winema NF LRMP would be amended to allow 10-15 years to meet the VQO for Scenic Management, Foreground Partial Retention, where the Pacific Connector right-of-way is adjacent to the Clover Creek Road from	Management 3B, Foreground Partial Retention, Standard and Guideline Scenic (1), (WNF LRMP, 4-107). Evidence of management	The 36 CFR 219 planning rule requirements that are directly related to this amendment include: § 219.10(a)(1) – […the responsible official shall	The project would initially affect about 50 acres of Management Area 3B. Over a period of 10 to 15 years, the affected area would decrease	POD (A) Aesthetics Management Plan for Federal Lands	Clover Creek Visual Management – 114 acres

TABLE 2.3.1-1

Proposed LRMP Amendments on the Winema NF

Amendment	Description	Text of Proposed Amendment	Related Planning Rule Requirements	Pacific Connector pipeline Impacts	Project Design Features	Compensatory Mitigation[13]
Road:	approximately pipeline MP 170 to 175 in Sections 2, 3, 4, 11, and 12, T.38S., R.5E., and Sections 7 and 18, T.38S., R.6E., W.M., OR. This change would potentially affect approximately 50 acres. Standards and Guidelines for Foreground Partial Retention (LRMP, page 4-107, MA 3B) require that VQOs be met within three years of completion of a project. The amendment would provide an exception from these standards for the Pacific Connector Pipeline Project and include specific mitigation measures and project design requirements for the project. This is a project-specific plan amendment that would apply only to the Pacific Connector Pipeline Project in the vicinity of Clover Creek Road and would not change future management direction for any other project.	activities from projects that produce slash (tree harvest) or charred bark (underburning) should not be noticeable from two to three years after the work has been completed, **with the exception of the Pacific Connector Pipeline right-of-way, which shall attain the VQO within 10 - 15 years after completion of the construction phase of the project where the pipeline crosses Management area 3B. The applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented.**	consider: …] "(1) Aesthetic values,… scenery,... viewsheds...". § 219.10(b)(i) – [the responsible official shall consider] "Sustainable recreation; including recreation settings, opportunities,…and scenic character…".	to about 29 acres. This amendment would affect approximately 0.3% of Management area 3B on the Winema NF	POD (I) Erosion Control and Revegetation Plan POD (P) Leave Tree Protection Plan POD (U) Right-of-Way Clearing Plan	
WNF-4: Project - Specific Amendment to Exempt Limitations on Detrimental Soil Conditions within the Pacific Connector Right-of-Way in All Management Areas:	The Winema NF LRMP would be amended to exempt restrictions on detrimental soil conditions from displacement and compaction within the Pacific Connector right-of-way in all affected management areas. Standards and Guidelines for detrimental soil impacts in all affected management areas require that no more than 20 percent of the activity area be detrimentally compacted, puddled, or displaced upon completion of a project (LRMP page 4-73, 12-5). The amendment would provide an exception from these standards for the Pacific Connector Pipeline Project and include specific mitigation measures and project design requirements for the project. This is a project-specific plan amendment applicable only to the Pacific Connector Pipeline Project and would not change future management direction for any other project.	Detrimental Soils Conditions, Standard and guideline 12-5, (WNF LRMP, 4-73). The cumulative effects of detrimental soil conditions should not exceed 20 percent of the total acreage within the activity area: any reason for exceeding the limitation shall be documented in an environmental assessment, **with the exception of the operational right-of-way and the construction zone for the Pacific Connector Pipeline, for which the applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented**. Detrimental soil conditions include compaction, displacement, puddling, and	The 36 CFR 219 planning rule requirements that are directly related to this amendment include: § 219.8(a)(2)(ii) – [The plan must include plan components to maintain or restore…] "Soils and soil productivity, including guidance to reduce soil erosion and sedimentation"	Approximately between 24 and 56 acres of detrimental soil conditions could result from pipeline construction This amendment would affect less than 0.01% of the Winema NF	POD (I) Erosion Control and Revegetation Plan POD (U) Right-of-Way Clearing Plan Technical Report on Soil Risk and Sensitivity Assessment (NSR 2014)	Road Decommissioning – approximately 29.2 Miles

TABLE 2.3.1-1

Proposed LRMP Amendments on the Winema NF

Amendment	**Description**	**Text of Proposed Amendment**	**Related Planning Rule Requirements**	**Pacific Connector pipeline Impacts**	**Project Design Features**	**Compensatory Mitigation**[13]
		moderately or severely burned soil from all activities (including roads, skid trails, and landings). Sites where the standards for displacement, puddling, and compaction are not currently met will require rehabilitation such as ripping, backblading, or fertilization. The potential for creating detrimental soil conditions will be specifically addressed through project environmental analyses. If needed, alternative management practices will be developed, and mitigating measures will be planned and implemented.				
WNF-5: Project-Specific Amendment to Exempt Limitations on Detrimental Soil Conditions within the Pacific Connector Right-of-Way in Management Area 8:	The Winema NF LRMP would be amended to exempt restrictions on detrimental soil conditions from displacement and compaction within the Pacific Connector right-of-way within the Management Area 8, Riparian Area (MA-8). This change would potentially affect approximately 0.5 mile or an estimated 9.6 acres of MA-8. Standards and Guidelines for Soil and Water, MA-8 require that not more than 10 percent of the total riparian zone in an activity area be in a detrimental soil condition upon the completion of a project (LRMP page 4-137, 2). The amendment would provide an exception from these standards for the Pacific Connector Pipeline Project and include specific mitigation measures and project design requirements for the project. This is a project-specific plan amendment applicable only to the Pacific Connector Pipeline Project and would not change future management direction for any other project.	Soil and Water, Standard & Guideline 3 (WNF LRMP 4-137). The cumulative total area of detrimental soil conditions in riparian areas shall not exceed 10 percent of the total riparian acreage within an activity area, **with the exception of the operational right-of-way and the construction zone for the Pacific Connector Pipeline, for which the applicable mitigation measures identified in the POD and Pacific Connector project design requirements must be implemented.** Permanent recreation facilities or other permanent facilities are exempt.	The 36 CFR 219 planning rule requirements that are directly related to this amendment include: § 219.8(a)(2)(ii) – [The plan must include plan components to maintain or restore…] "Soils and soil productivity, including guidance to reduce soil erosion and sedimentation".	Approximately between 3 and 6 acres of detrimental soil conditions could result from the pipeline construction This amendment would affect less than 0.01% of the Winema NF	POD (I) Erosion Control and Revegetation Plan POD (U) Right-of-Way Clearing Plan POD (BB) Wetland and Waterbody Crossing Plan Forest Service Site Specific Stream Crossing Prescriptions (NSR 2014) Stream Crossing Risk Analysis; and Stream Crossing Risk Analysis Addendum (GeoEngineers2017d, 2018a) Chapter 3, FEIS Route Design and Modifications on Forest Service Managed Lands	Road Decommissioning – approximately 29.2 Miles LWD in-stream – 1.0 miles Riparian Planting – 0,5 miles Riparian Fencing – 6.5 miles Stream Crossing Repair – 25 sites

TABLE 2.3.1-2

Mitigation Projects to Address LRMP Objectives on the Winema

Unit	Watershed	Mitigation Group	Project Type	Project Name	Quantity a/	Unit
Winema NF	Spencer Creek	Aquatic and Riparian Habitat	Riparian Planting	Spencer Creek Riparian Planting	0.5	miles
		Aquatic and Riparian Habitat	Riparian Fencing	Spencer Creek Fencing	6.5	miles
		Aquatic and Riparian Habitat	LWD In-stream	Spencer Creek In-stream LWD	1.0	miles
		Aquatic and Riparian Habitat	Stream Crossing Repair	Spencer Creek Ford Hardening and Interpretive Sign	1	sites
		Aquatic and Riparian Habitat	Stream Crossing Repair	Spencer Creek Stream Crossing Decommissioning	25	sites
		Road sediment reduction	Road Decommissioning	Spencer Creek Road Decommissioning	29.2	miles
		Visuals	Stand Density Reduction	Clover Creek Visual Management.	114	acres

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a/ Acres are rounded to the nearest whole acre and miles to the nearest tenth of a mile.

Figure 2.3-1. Map of CMP Projects in the Spencer Creek Watershed on the Winema NF

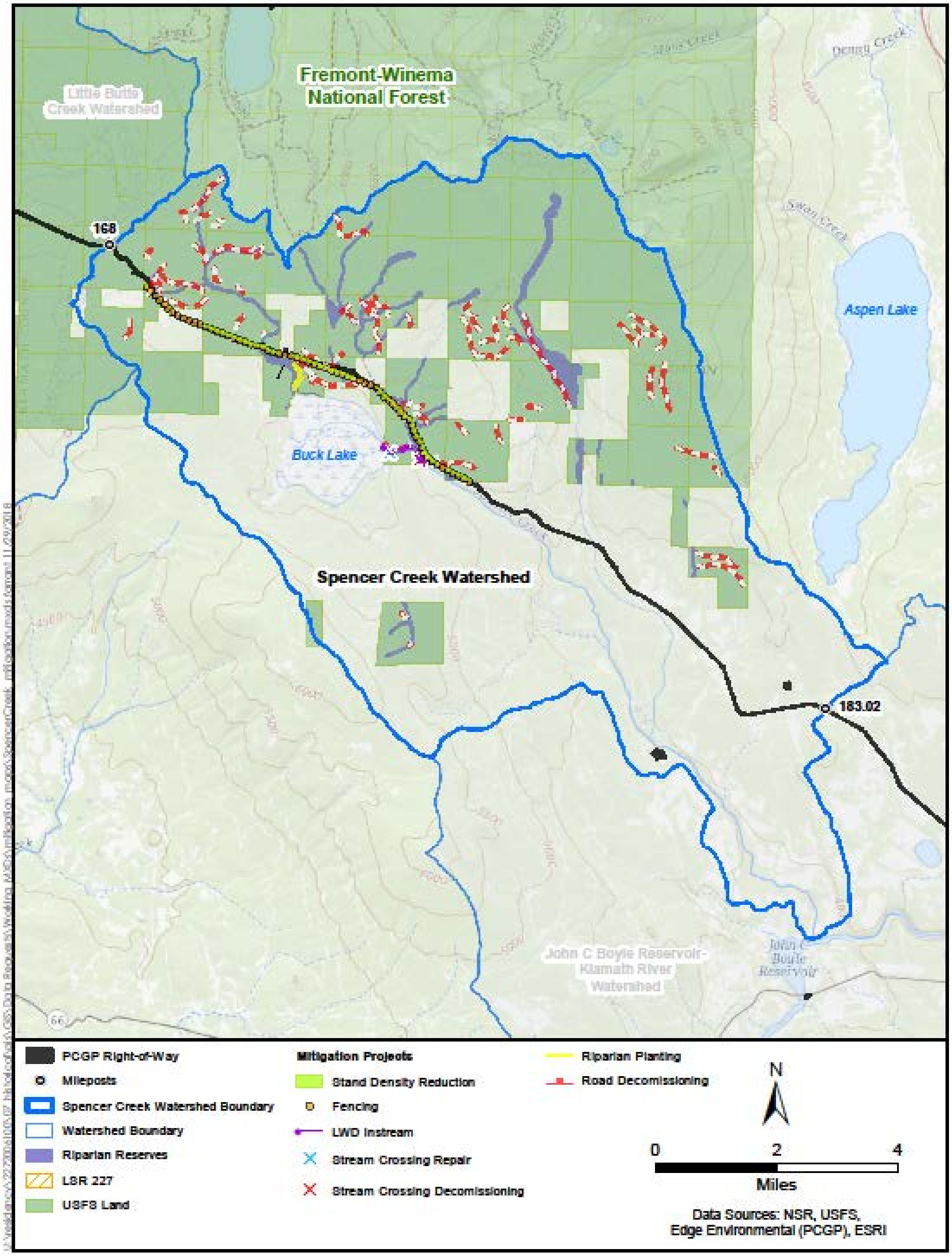


TABLE 2.3.1-3

Evaluation of Winema NF Mitigation Projects by Mitigation Group and Project Type

Mitigation Group	Project Type	Amount	Rationale	Environmental Consequences
Aquatic and Riparian Habitat	Large Woody Debris In-stream	1.0 Miles	Over the last century, many streams with high aquatic habitat potential have become simplified, and therefore, have a reduced capacity to provide quality habitat. Riparian stands have decreased health and vigor, resulting in increased time to develop large tree structure for wildlife, stream shade, and future instream wood. Placement of LWD in streams adds structural complexity to aquatic systems, traps fine sediments and can contribute to reductions in stream temperatures over time (Tippery et al. 2010). The BLM completed placement last year on 3 miles of Spencer Creek below this reach. Addition of this segment would complete the stream rehabilitation on the reach of Spencer Creek where the project occurs. Logs from the Pacific Connector pipeline Right of Way will be used for the project. An estimated 75 pieces are needed. A helicopter will be used to place the logs. This is responsive to Aquatic Conservation Strategy (ACS) objectives 2, 3, 4, and 5.	**Short-term adverse effects**: LWD in-stream refers to logs (typically greater than 20 inches in diameter), limbs, or root wads that intrude into a stream channel. Placing this material in-stream can be accomplished with ground equipment such as excavators and/or helicopters. These activities have the potential to increase suspended sediment in streams and impact riparian vegetation as a result of heavy equipment use or the dragging of materials (e.g. logs) in the stream channel. Short-term impacts to water quality would occur in the form of suspended sediment and turbidity increases during in-stream implementation. However, no lasting measureable effect to water quality would occur as any sediment plume created, would quickly dissipate as soon as in-stream activities stop. In-stream work is done during summer low flow periods when turbidity plumes are an infrequently occurring event. Project design features (PDF) would include Best Management Practices (BMP) that would prevent any indirect effects to salmonids and other stream fish from project related sediment. The placement of LWD materials in the stream by using helicopters would create noise that could disturb NSO. The PDFs would focus disturbance outside the critical nesting period and beyond critical distances for NSO. These PDFs would reduce impacts from noise to acceptable levels. **Long-term beneficial effects:** Placing LWD in streams affects channel morphology, the routing and storage of water and sediment, and provides structure and complexity to stream systems. Complex pools and side channels created by instream wood provide overwintering habitat to stream salmonids and other aquatic organisms (Solazzi et. al. 2000). They also provide cover from predators during summer low flow periods when predation is at its highest. Providing more stream channel structure results in better over wintering habitat, improved summer pool habitat, and more abundant spawning gravels.
Aquatic and Riparian Habitat	Stream Crossing Repair and Interpretive Sign	25 Sites	Restoring stream crossings reconnects aquatic habitats by allowing the passage of aquatic biota and restoring riparian vegetation. Over time, these actions reduce sediment and restore shade. Restoration of these crossings includes riparian planting as a mitigation which will help offset the impact of shade removal at pipeline R/W crossings. The proposed pipeline will cross Spencer Creek upstream of Buck Lake. It is occupied by redband trout. Spencer Creek has been identified by NMFS as habitat for Federally listed Southern Oregon/Northern California Coast Coho salmon. Additionally, once fish passage is provided through the Klamath River hydro facilities, steelhead will re-colonize Spencer Creek. Improving habitat quality at Spencer Creek provides the opportunity to be pro-active in providing quality habitat for SONC Coho, mitigating for any detrimental effects to other SONC Coho habitats, while improving habitat for redband trout and other aquatic species. Spencer Creek appears on the Oregon DEQ 303(d) list as water quality impaired from increased sedimentation. Improvements at this location will immediately benefit all downstream aquatic habitats and the species associated with those habitats. This includes interpretive signage.	**Short-term adverse effects:** Removing old culverts and restoring stream/road crossings would result in short-term adverse effects from the use of heavy equipment in and around the stream channel. The work would be done during low summer flow periods to minimize impacts to aquatic species and PDFs would be designed to minimize disturbance for Northern Spotted Owl (NSO). **Long-term beneficial effects:** Stream crossing replacement would directly improve stream connectivity and habitat for aquatic species by immediately restoring access to formerly inaccessible habitats. Indirectly, these projects would reduce potential sediment levels in the long term by decreasing the potential for road failure. Stream crossing projects also reduce stream velocities by increasing stream crossing sizes, eliminating flow restrictions and allowing passage to additional reaches of habitat by removing barriers to aquatic species which improves access to spawning and rearing habitat and allows unrestricted movement throughout stream reaches during seasonal changes in water levels (Hoffman 2007).
Aquatic and	Riparian Planting	0.5 Miles	Spencer Creek just upstream of Buck Lake. This is a meadow	**Short-term adverse effects**: This activity is not expected to result in any measurable adverse

TABLE 2.3.1-3

Evaluation of Winema NF Mitigation Projects by Mitigation Group and Project Type

Mitigation Group	Project Type	Amount	Rationale	Environmental Consequences
Riparian Habitat			site that has lost streamside vegetation and has compacted soils. There is an overall need to restore health and vigor to riparian stands by maintaining and improving riparian reserve habitat. Shade provided by the plantings will contribute to moderating water temperatures in Spencer Creek. Root strength provided by new vegetation will increase bank stability, decrease erosion and sediment depositions to Spencer Creek and provide habitat for species that use riparian habitats.	impacts. **Long-term beneficial effects:** Beneficial impacts include helping to re-vegetate and stabilize riparian habitat and improving habitat for listed or sensitive species.
Aquatic and Riparian Habitat	Riparian Fencing	6.5 Miles	This fence would serve to divide the Buck Indian Allotment into pastures north and south at Clover Creek Road. This fence would keep cattle from grazing newly revegetated areas in the Right of Way corridor, including areas where the corridor crosses Spencer Creek, thus helping to ensure that erosion control and revegetation objectives are met. It will also serve to separate anticipated increased cattle grazing of the ROW from the highway; greatly reducing a safety hazard for vehicles traveling the Clover Creek road. This fence would require 7-9 cattle guard crossings for Forest Roads intersecting the fence	**Short-term adverse effects**: This activity is not expected to result in any measurable adverse impacts. **Long-term beneficial effects:** Beneficial impacts include helping to ensure erosion control and revegetation objectives are met and providing additional protection of riparian areas from cattle grazing.
Road Sediment Reduction	Road Decommissioning	29.2 Miles	Road closure reduces fine grained sediments by eliminating traffic impacts. A construction corridor 75-95 wide with additional work areas will be cleared. Of this, a 30-wide route along the pipeline route will be maintained in early successional habitat. This strip of land, in a forested ecosystem, provides a barrier for movement of small animals between the remaining forest blocks and degrades neighboring habitat through edge effects and fragmentation. This is of special concern in riparian ecosystems where movement of wildlife species is concentrated. Decommissioning and planting selected roads can block up forested habitat and reduce edge effects and fragmentation in a period of about 40 years. Decommissioning roads can substantially reduce sediment delivery to streams (Madej 2000; Keppeler et al. 2007). Proposed road decommissioning would increase infiltration of precipitation, reduce surface runoff, and reduce sediment production from road-related surface erosion in the watershed where the impacts from the Project occur. This mitigation addresses ACS objectives 2, 4, 5, 8 & 9.	**Short-term adverse effects:** Road decommissioning methods generally include actions utilizing mechanized construction equipment to physically stabilize the road prism, restore natural drainage patterns, and allow for revegetation of the roadbed. Mechanized construction equipment might include excavators, backhoes and truck mounted loaders. Road decommissioning has the potential to cause short-term degradation of water quality by increasing sediment delivery to streams as roads are de-compacted by heavy equipment, culverts and cross drains are removed, and other restoration activities are implemented. The use of heavy mechanized equipment near streams could disturb the stream influence zone, deliver sediment, create turbidity, and cause stream bank erosion. There is also the potential of an accidental fuel/oil spill. These projects may cause a short-term degradation of water quality due to sediment input and chemical contamination. Stream bank condition and habitat substrate may also be adversely affected in the short term. However with careful project design and seasonal timing, these affects are expected to be of a limited extent and duration. Road decommissioning would create noise from heavy equipment that could disturb NSO. The potential for disturbance is mainly associated with breeding behavior at active nest sites. The PDFs would focus disturbance outside the critical nesting period and beyond critical distances for NSO. These PDFs would reduce impacts from noise to acceptable levels. **Long-term beneficial effects**: Proposed road decommissioning would increase infiltration of precipitation, reduce surface runoff, and reduce sediment production from road-related surface erosion in the watershed where the impacts from the Project would occur. Decommissioning roads would restore natural drainage patterns and thereby avoid large volumes of added sediment to the stream network that would be likely to eventually occur. In addition limited road maintenance dollars could be focused on the remaining road systems resulting in more maintenance of culverts and ditchlines resulting in less potential for catastrophic failure. Madej (2000) concluded that by eliminating the risk of stream diversions and culvert failures, road removal treatments significantly reduce long-term sediment production from retired logging roads.

TABLE 2.3.1-3

Evaluation of Winema NF Mitigation Projects by Mitigation Group and Project Type

Mitigation Group	Project Type	Amount	Rationale	Environmental Consequences
Visuals	Stand Density Reduction	114 Acres	The Pacific Connector pipeline will create a hard line along the timbered edge of the corridor that does not fit with the visual objectives for the Clover Creek Road or the Dead Indian Memorial Highway. Thinning and fuels treatments can be used to soften the edge to a more natural appearing texture by restoring stand density to more natural levels and creating small openings that are consistent with landscape. Thinning of commercial sized material may be accomplished with a commercial timber sale. The mitigation is intended to supplement funding for the non-commercial part of that work for visual purposes that could not otherwise be accomplished.	**Short-term adverse effects:** Stand density management activities include the use of heavy equipment for cutting, skidding, slash piling, and hauling forest vegetation. Soil erosion risk would increase with the proposed activities because bare soil would be exposed during implementation. As the amount of bare/compacted soil increases, so does the risk of soil movement. Impacts caused by heavy equipment would increase the amount of detrimental soil damage within the treatment areas. By maintaining proper amounts of protective groundcover along with appropriate BMPs and PDFs, the risk of erosion, sediment delivery, and detrimental soil damage within the treatment areas is expected to be minimal and within LMP standards and guidelines. Stand treatments would not be expected to adversely affect nesting habitat for the NSO since the treatments would not remove constituent elements of their nesting habitat. Stand density treatments would create noise from heavy equipment that could disturb the NSO. The potential for disturbance is mainly associated with breeding behavior at active nest sites. The PDFs would focus disturbance outside the critical nesting period and beyond critical distances for NSO. These PDFs would reduce impacts from noise to acceptable levels. **Long-term beneficial effects:** By creating less dense stands with less tree competition, residual trees would benefit from the increased availability of sunlight, nutrients, and water. With the increase of available nutrients, trees should be more vigorous and less susceptible to large scale insect/disease outbreaks. The proposed treatments would enhance visuals by softening the edges created by the pipeline and restoring stand density, species diversity, and structural diversity more characteristic under a natural disturbance regime.

TABLE 2.3.1-4

Comparison of Total Acres of Proposed Project-Specific Amendments and Compensatory Mitigation on the Winema NF

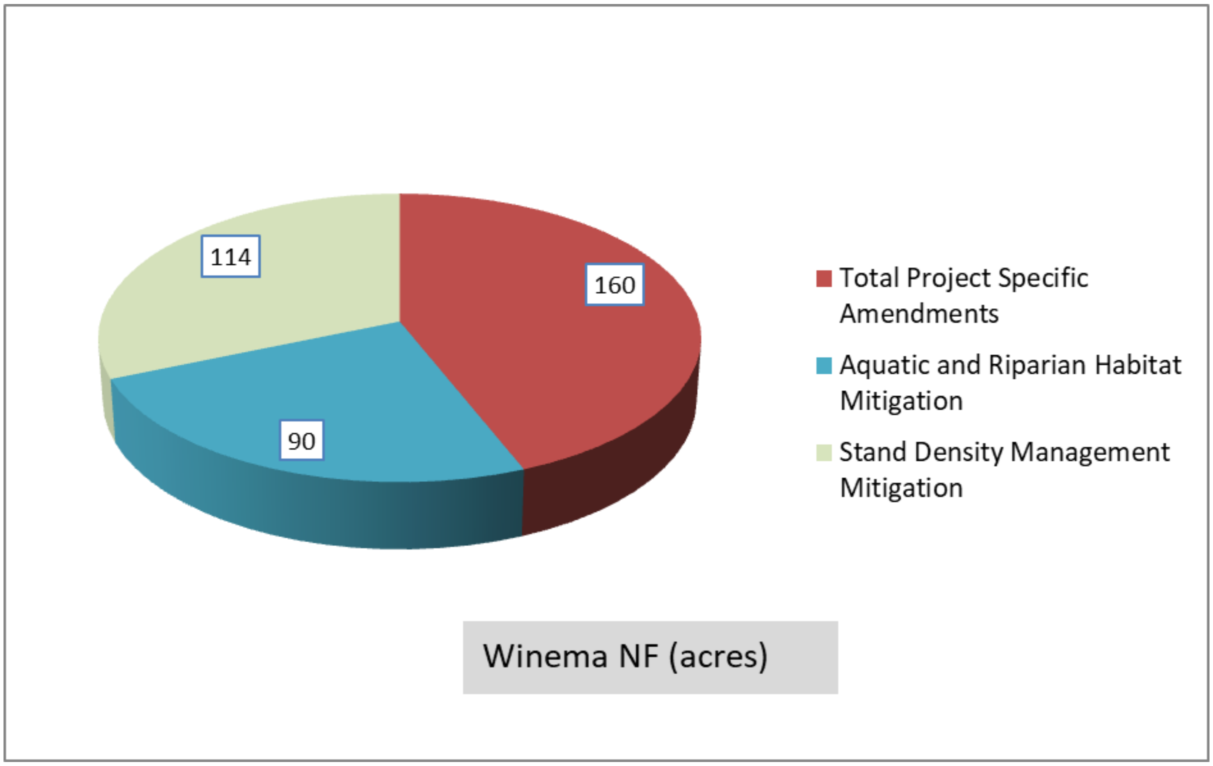
Amendments and Compensatory Mitigation	Acres
Total Project Specific Amendments[1]	160
Aquatic and Riparian Habitat Mitigation[2]	90
Stand Density Management (Visuals)	114

Data Source: USFS GIS Data Layers

1) Includes amendments FS-1, WNF-1, WNF-2 WNF-3, WNF-4 and WNF-5

2) Includes road sediment reduction, LWD, riparian fencing, and riparian planting actions and assumes a 20 foot wide treatment area

Figure 2.3-2. Comparison of Total Acres of Proposed Project-Specific Amendments and Compensatory Mitigation on the Winema NF



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APPENDIX F.3

Late Successional Reserves Crossed by the PCGP Project on National Forest System Lands

Jordan Cove Natural Gas Liquefaction and Pacific Connector Gas Pipeline Project

Final EIS

Appendix F.3

Late Successional Reserves Crossed by the PCGP Project on National Forest System Lands

Pacific Connector Gas Pipeline

Umpqua and Rogue River National Forests

Prepared for:

USDA Forest Service

Prepared by:

Stantec Consulting Services Inc.

October 2019

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1.0 INTRODUCTION

The 1994 Northwest Forest Plan (NWFP) Record of Decision (ROD) created a new land use allocation called Late-Successional Reserves (LSR). LSRs are designed to maintain late-successional (mature or old-growth) forests in a well-distributed pattern across federal lands within the range of the northern spotted owl (NSO) (Mouer et al. 2011). The NWFP contains standards and guidelines for LSRs. As defined in the NWFP ROD, these standards and guidelines constitute the "rules and limits governing actions, and the principles specifying the environmental conditions or levels to be achieved" in each LSR (USDA and USDI 1994, page F-4).[1]

The proposed Pacific Connector Gas Pipeline (PCGP) project would cross three U.S. Forest Service (Forest Service) national forests. The land and resource management plans (LRMPs) of the three national forests (NF) that would be crossed by the PCGP project—Rogue River, Umpqua, and Winema—were amended by the NWFP to include LSR designations and standards and guidelines.

In crossing these federal lands, the PCGP project would traverse portions of two large (mapped) LSRs RO-223 (223) located in the Umpqua NF and RO-227 (227) located in the Rogue River NF. The PCGP project as presently proposed does not affect any LSR on the Winema NF. For development proposals like the PCGP project, the LSR standards and guidelines state that pipelines should be planned to have the least possible adverse impacts on LSRs (USDA and USDI 1994, page C-17). The standards and guidelines also state that these types of proposals will be reviewed on a case-by-case basis and may be approved when adverse effects can be minimized and mitigated.

To meet this direction, the Forest Service has provided input to the applicant regarding project design. First, in routing the proposed PCGP project, LSRs have been avoided where possible. Second, where impacts to LSRs are unavoidable, onsite "Design Features" or "Project Requirements"[2] have been developed to minimize the impacts. Third, in order to ensure that the objectives would continue to be achievable in these LSRs, land reallocations are being proposed as part of a compensatory mitigation plan. These proposed land reallocations would take non-LSR (i.e., matrix) lands and designate them as LSRs. The reallocations will require amendments to the LRMPs for the Umpqua NF and Rogue River NF. Fourth, off-site compensatory mitigation actions have been proposed to aid in off-setting unavoidable adverse impacts. These proposed mitigation actions and related plan amendments for LSRs are the primary focus of this report.

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[1] Originally the NWFP covered federal lands managed by the Bureau of Land Management (BLM) and Forest Service within the range of the NSO. However, in August 2016, the BLM issued new Resource Management Plans that replaced the management direction for BLM lands. Therefore, the management direction in the NWFP no longer applies to BLM lands.

[2] The Forest Service uses the term "Design Features" or "Project Requirements" rather than "mitigation" to describe elements of a plan that occur within a project area and are standard requirements of a project. The Forest Service reserves the term "mitigation" to describe measures taken to reduce or compensate for otherwise unavoidable impacts.

1.1 REPORT FORMAT

1.1.1 Purpose

The purpose of this technical report is to provide the information necessary to support findings by agency decision makers regarding impacts of the proposed PCGP project on the LSRs that the pipeline would cross. The National Forest Management Act (NFMA) of 1976 requires projects or other management activities on Forest Service-managed lands to be consistent with the relevant land management plans. This means that decision makers for the Forest Service must determine whether or not the proposed PCGP project would be consistent with the standard and guidelines for new developments in LSRs.

1.1.2 Approach

Section 1 of this report provides background on the NWFP and the development of the LSR designation as part of the overall strategy to maintain healthy forest ecosystems that will support populations of native species associated with late-successional and old-growth (LSOG) forests. Included are overviews of the LSR components and standards and guidelines, as well as a summary of the content and role of Late-Successional Reserve Assessments (LSRAs).

Section 2 provides an evaluation organized by Forest Service unit of PCGP project impacts and related mitigation actions in individual LSRs. Each LSR evaluation includes a summary of relevant information from the associated LSRA, updated, as appropriate, with any significant new information. This section also includes an evaluation of proposed off-site mitigation actions and related plan amendments for each affected LSR and their impacts, if any, on attainment of LSR objectives. Finally, Section 2 evaluates the consistency of the proposed project and mitigation with the LSR standards and guidelines. Section 3 of this report lists the role and experience of the report preparers, and Section 4 lists the references cited in this report.

1.1.3 Agency Use

As a cooperating agency, the Forest Service will use information in this report to prepare portions of the PCGP Project Environmental Impact Statement (EIS) that are relevant to proposed agency actions.

The Forest Service will also use the information in this report along with other relevant information in the EIS in making its decision to approve or not approve LSR-related amendments to the relevant LRMPs, and in its determination regarding concurrence with BLM’s granting of a right-of-way for the project.

1.2 LATE SUCCESSIONAL RESERVES

1.2.1 Background

In the 1980s, public controversy intensified over timber harvesting of LSOG forests; declining populations of LSOG-related species such as the northern spotted owl (NSO) and marbled murrelet (MAMU), which are both listed as threatened under the Endangered Species Act (ESA); and the role of federal forests in regional and local economies. Litigation and court injunctions on harvesting of LSOG forests on federal land resulted in gridlock for federal timber sales and economic impacts to communities dependent on the timber resource. Congress, seeking a permanent solution to the gridlock, commissioned a group of scientists to develop and evaluate different strategies for protecting LSOG forests on federal lands within the range of the NSO. This scientific team mapped areas of significant LSOG forests and developed several strategies for protecting them (Scientific Panel on Late-Successional Forest Ecosystems 1991). The turmoil ultimately led to President Clinton's convening a Forest Conference in Portland, Oregon, on April 2, 1993, to address the human and environmental needs served by federally managed forests in Washington, Oregon, and northern California (Mouer et al. 2011). Following the conference, an interagency team of scientists, economists, sociologists, and others—the Forest Ecosystem Management Assessment Team or FEMAT—was assembled to develop proposals for the management of over 24 million acres of public land within the range of the NSO.

On July 1, 1993, President Clinton announced his forest plan for a sustainable economy and a sustainable environment (Clinton and Gore 1993). During the same month, FEMAT issued its report, "Forest Ecosystem Management: An Ecological, Economic and Social Assessment" (FEMAT 1993), which provided the framework for subsequent National Environmental Policy Act (NEPA) decision-making. Over the next year, NEPA analyses were completed, and an EIS was developed. The ROD associated with this EIS was signed in 1994, implementing new management direction for the public lands within the range of the NSO (USDA and USDI 1994). The ROD amended existing management plans for 19 national forests and seven BLM districts[3] in California, Oregon, and Washington. The ROD and accompanying standards and guidelines are commonly referred to as the Northwest Forest Plan. The ROD for the Final EIS is available at http://www.reo.gov/library/reports/newroda.pdf, and the standards and guidelines are available at http://www.reo.gov/library/reports/newsandga.pdf.

The NWFP established the following objectives for the land use allocations and standards and guidelines (USDA and USDI 1994, page 3):

- Comply with the requirements of federal law.
- Be based on the best available science and be ecologically sound.
- Protect the long-term health of federal forests.
- Provide for a steady supply of timber and non-timber resources that can be sustained over the long term without degrading forest health or other environmental resources.

The NWFP standards and guidelines created new land use allocations that overlay existing management directions in the relevant land management plans (USDA and USDI 1994). These plans, as amended, are consistent with all management directions in the NWFP regarding the proposed PCGP project. The standards and guidelines in the current FS management plans apply where they are more restrictive or provide greater benefits to late-successional forest related species than other provisions of the standards and guidelines in the NWFP (USDA and USDI 1994, page C-2).

The NWFP allocated a network of LSR reserves to conserve species of concern within the existing configuration of land ownership and the location of remaining LSOG forests within the range of the NSO. The reserve network is embedded in a matrix of "working" forests and was designed to maintain LSOG forests in a well-distributed pattern across these federal lands (Mouer et al. 2011).

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[3] As noted in footnote 1 above, the management direction for the BLM lands has since been replaced by new Resource Management Plans approved in August 2016.

The LSR network is composed primarily of areas of large (mapped) reserves, but also includes smaller areas of “unmapped” reserves that are composed of sites occupied by MAMUs or are known northern spotted owl activity centers (known owl activity centers (KOACs). The LSR standards and guidelines are designed to guide management activities occurring within these LSRs to protect and enhance the conditions of the LSOG forest ecosystems contained therein (USDA and USDI 1994). The proposed PCGP project would cross two mapped LSRs (223 and 227). In its present alignment, the PCGP project would not cross any unmapped LSRs.

1.2.2 LSR Objectives/Goals

The overall objective of the LSR network is to protect and enhance conditions of LSOG forest ecosystems that serve as habitat for LSOG-related species, including the listed NSO and marbled murrelet. The reserves are designed to help achieve the following goals (USDA and USDI 1994, page B-4):

- Promote a distribution, quantity, and quality of LSOG forest habitat sufficient to avoid foreclosure of future management options.
- Provide habitat for populations of species associated with LSOG forests.
- Help ensure that LSOG species diversity will be conserved.

The LSR land allocations and standards and guidelines have been specifically designed to help achieve these goals.

1.2.3 LSR Elements

In 1994, the standards and guidelines for the NWFP described five elements that were used to designate LSRs.

> Late-Successional Reserves have been designated based on five elements: (1) areas mapped as part of an interacting reserve system; (2) LS/OG 1 and 2 areas within Marbled Murrelet Zone 1, and certain owl additions, mapped by the Scientific Panel on Late-Successional Forest Ecosystems (1991); (3) sites occupied by marbled murrelets; (4) known owl activity centers; and (5) Protection Buffers for specific endemic species identified by the Scientific Analysis Team (SAT) (1993). (USDA and USDI 1994b, page C-9)

Today, elements (1) and (2) are commonly referred to as “mapped” LSRs, and elements (3) and (4) are commonly referred to as “unmapped” LSRs. Although element (5), protection buffers, was originally part of the LSR network, it was later removed by the 2001 ROD for Amendments to the Survey and Manage, Protection Buffer, and Other Mitigation Measures Standards and Guidelines (USDA and USDI 2001b). The 2001 ROD retained the direction to manage known sites of protection buffer species but removed their designation as small, species-specific LSRs.

1.2.4 Mapped LSRs

Most LSR areas are mapped. Several factors were considered in designating these reserves, including key watersheds and significant areas of old-growth forest that had previously been identified (USDA and USDI 1994b). These included LS/OG 1 and 2 areas (most ecologically significant and ecologically significant late-successional and old-growth forests, respectively) identified by the Scientific Panel on Late-Successional Forest Ecosystems (Johnson et al. 1991).

Maps of the LSR network are available at the following website: http://www.reo.gov/gis/data/gisdata/index.htm. Maps of the LSRs that would be crossed by the PCGP project are described in Section 2 of this report.

1.2.5 Unmapped LSRs

Unmapped LSRs include sites occupied by MAMUs and KOACs.[4] For MAMUs, surveys are required for projects that occur within MAMU habitat to determine if there is occupation within the project area. If occupation is documented, all contiguous existing and recruitment habitat within a 0.5-mile radius is to be protected and managed by the standards and guidelines for LSRs. The standards and guidelines for LSRs also apply to KOACs (as of January 1, 1994) located in matrix or Adaptive Management Areas of the NWFP. Activity centers are defined as an area of concentrated activity of either a pair of spotted owls or a territorial single owl. Each KOAC has a 100-acre area identified around or near the activity center, where the standards and guidelines for LSRs apply (USDA and USDI 1994b). The construction of the PCGP corridor as currently proposed would not cross any unmapped LSRs.[5]

1.2.6 LSR Standards and Guidelines

The standards and guidelines for LSRs are contained in Attachment C (pages C-9 through C-21) of the NWFP ROD. They are designed to protect and enhance conditions of LSOG forest ecosystems that serve as habitat for LSOG species. They are written to apply to specific management actions such as silviculture, range management, mining, new developments, etc., and should be interpreted in that context. The standards and guidelines that apply to new developments such as pipelines are addressed on page C-17 of the NWFP standards and guidelines. The standard on page C-17 states;

> Developments of new facilities that may adversely affect Late-Successional Reserves should not be permitted. New development proposals that address public needs or provide significant public benefits, such as powerlines, pipelines, reservoirs, recreation sites, or other public works projects will be reviewed on a case-by-case basis and may be approved when adverse effects can be minimized and mitigated. These will be planned to have the least possible adverse impacts on Late-Successional Reserves. Developments will be located to avoid degradation of habitat and adverse effects on identified late-successional species.

On January 3, 2001 the Regional Interagency Executive Committee for the NWFP issued Instruction Memorandum No, OR-2001-016 titled "Interpretation of the Northwest Forest Plan Standards and Guidelines Regarding New Developments in Late-Successional Reserves" (USDA and USDI 2001 Memorandum). This guidance was followed including the guidance for

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[4] It should be noted that the term "unmapped" LSR is being used to distinguish the LSR areas represented by occupied MAMU stands and KOACs from the larger "designated" or "mapped" LSRs in the NWFP. However, with implementation of the NWFP, these areas have been mapped and are managed under the standards and guidelines for LSR.

[5] Table 4.7.3.3-2 in the draft EIS listed an estimated one acre of unmapped LSR that may be impacted by road improvements on an existing road on the Rogue River NF. However, that road improvement is located within LSR 227 and is therefore not in an unmapped LSR. This table has been corrected in the final EIS.

determining conditions neutral or beneficial to the creation and maintenance of late-successional habitat.[6]

The Commission will consider the need and public benefit of this Project when making its decision on whether or not to authorize it, as documented in the Project Order. The cooperating agencies will consider public benefit within the context of each agency's respective authorities. Each cooperating agency will document its decision in the applicable permit, approval, concurrence, or determination. The LSR standards and guidelines provide the framework upon which the proposed LSR mitigation actions and related plan amendments for the PCGP project are evaluated.

1.2.7 LSRAs

The LSR standards and guidelines specify that management assessments be prepared for each large LSR (or groups of smaller LSRs) before habitat-disturbing projects are allowed to occur in these areas. The standards and guidelines (page C-11 of the NWFP ROD, USDA and USDI 1994) directed that these LSRAs include:

> “(1) a history and inventory of overall vegetative conditions within the reserve, (2) a list of identified late-successional associated species within the reserve, (3) a history and description of current land uses within the reserve, (4) a fire management plan, (5) criteria for developing appropriate treatments, (6) identification of specific areas that could be treated under those criteria, (7) a proposed implementation schedule tiered to higher order (i.e., larger scale) plans, and (8) proposed monitoring and evaluation components to help evaluate if future activities are carried out as intended and achieve desired results.”

The Forest Service uses LSRAs to better understand the existing conditions in the LSRs, develop criteria for appropriate treatments, and identify and prioritize actions that would further LSR objectives. The NWFP directed that LSRAs would be subject to review by the Regional Ecosystem Office (REO). The REO provides staff work, support, and recommendations to the Regional Interagency Executives concerning the implementation of the NWFP (USDA and USDI 1994, page E-16). The standards and guidelines for LSRs also require REO review of projects in LSRs, such as thinning of trees, prescribed fire, salvage of dead trees, and others (USDA and USDI 1994, page C-12 through C-19). Once an LSRA has been reviewed by the REO, projects that are determined to be in conformance with relevant project criteria in the LSRA are exempt from further REO review. It is also intended that LSRAs be treated as ‘living’ assessments that should be updated over time as new data become available, conditions change (e.g., due to fires), and projects are implemented and monitored.

The two LSRAs relevant to the LSRs that would be affected by the PCGP project include the South Cascades LSRA for LSR 227 (April 1998) and the South Umpqua River/Galesville LSRA

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[6] The introduction to the Standards and Guidelines for Multiple-Use Activities Other Than Silviculture states; “As a general guideline nonsilvicultural activities located inside Late-Successional Reserves that are neutral or beneficial to the creation and maintenance late-successional habitat are allowed” (NWFP page C-16). The 2001 memorandum provides the detailed guidance for considering new developments in LSR including the “neutral or beneficial” standard.

for LSR 223 (July 1999). These assessments are discussed in further detail in Section 2 of this report and are available at the following website: http://www.reo.gov/lsr/assessments/

1.3 OVERVIEW

1.3.1 Energy Transmission on Federal Lands

By law, energy transmission can be a legitimate use of public land. The U.S. Congress has determined that public lands, including Forest Service lands, play a significant role in energy development and transmission. This intent has been expressed in legislation that dates back to the Mineral Leasing Act of 1920. Because federal lands are so extensive in the Pacific Northwest, it would be practically impossible to avoid them and still construct interstate power transmission lines or natural gas pipelines that connect to distribution hubs. If utility corridors could not cross public lands, the impacts on private lands from easements would increase, and overall costs resulting from longer, more indirect routes would also increase. These costs would be ultimately carried by the public.

While the Forest Service has a mission to manage public lands, the Federal Energy Regulatory Commission (FERC) determines where and when new energy sources and transmission facilities can be developed. FERC is also the federal agency responsible for authorization of natural gas pipelines and certain other types of energy projects. Construction and operation of utilities like the PCGP project are regulated by FERC to ensure that public interests are protected.

When FERC accepts an application from a utility company to cross public land, Congress, through the 2005 Energy Policy Act (EPAct), has directed the responsible agencies to coordinate with FERC to process applications required to construct the project. The 2005 EPAct reinforced Executive Order (EO) 13212 issued May 18, 2001, which directed federal agencies to take appropriate actions, consistent with applicable law, to expedite reviews of applications for energy-related projects and to take other action necessary to accelerate the completion of such projects while maintaining safety, public health, and environmental protections. To facilitate EO 13212, the Secretaries of Agriculture, Interior, and Energy and other federal agencies have agreed, through a formal Memorandum of Understanding (Interagency MOU, 2002), to coordinate their efforts and to cooperate in the expeditious processing of applications for construction of natural gas pipelines. These policies were further expanded with EO 13766–Expediting Environmental Reviews and Approvals for High Priority Infrastructure Projects issued January 24, 2017, and EO 13807–Presidential Executive Order on Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure, issued August 15, 2017. These Executive Orders established a process for federal agencies to coordinate and track the environmental review and permitting processes for major infrastructure projects.

The underlying need for action of the PCGP project is for FERC to respond to the 2017 application to authorize the Jordan Cove export terminal and PCGP, and for the BLM to respond to a right-of-way grant application originally filed by Pacific Connector on April 17, 2006. The right-of-way grant would allow Pacific Connector to construct, operate, maintain, and eventually decommission a natural gas pipeline that would cross lands and facilities administered by the BLM, Forest Service, and the Bureau of Reclamation. In addition, there is a need for the BLM and Forest Service to consider amending land management plans to make provision for the PCGP right-of-way.

FERC will analyze the environmental consequences of the construction and operation of the proposed PCGP project in its EIS. The BLM and Forest Service have identified the specific sections of their RMPs and LRMPs that would need to be amended to make provision for the proposed project. The BLM and Forest Service will independently evaluate the proposed RMP and LRMP amendments using the NEPA process, as required by the planning regulations of each agency. The BLM and Forest Service will use FERC's consolidated public record for analysis of environmental consequences associated with construction and operation of the PCGP project. The proposed RMP/LRMP amendments will be included and evaluated as part of the FERC EIS. This report evaluates the consistency of the proposed PCGP project and mitigation actions with the standards and guidelines for LSR on national forest system lands.

1.3.2 The Proposed PCGP Project on Forest Service Lands

The proposed pipeline would cross three national forests (Rogue River, Umpqua, and Winema) for a total of approximately 31 miles. The proposed project would affect mapped LSRs on the Rogue River and Umpqua NFs. As presently configured, the proposed PCGP project would not cross any LSRs on the Winema NF. Table 1.3.2-1 and figure 1.3-1 provide an overview of the number of acres that would be directly affected by the PCGP project within LSRs on each affected unit of the Forest Service. The mapped LSR that would be crossed on the Umpqua NF is depicted in figure 2.1-1, and the mapped LSR that would be crossed on the Rogue River NF is depicted in figure 2.2-1.

Direct effects would occur in the areas that would be cleared (i.e., forest vegetation would be removed) for the pipeline right-of-way and the temporary extra work areas (TEWAs). Direct effects would also occur on acres that would be "modified" by the PCGP project. These acres include uncleared storage areas (UCSAs) that would not be cleared of trees during construction. These areas would be used to store forest slash, stumps, and dead and downed log materials that would be scattered across the right-of-way after construction, which would be considered temporary habitat modifications.

Indirect effects from construction of the pipeline are also expected within LSRs that have interior forest that the NSO rely on for nesting habitat. The conversion of large tracts of LSOG forest to small, isolated forest patches with large edge areas can create changes in microclimate, vegetation species, and predator-prey dynamics. Such edge effects—the magnitude of changes over distance from the edge to forest interior—would depend on the general orientation to the sun. Two main physical factors affecting and creating an edge microclimate are sun and wind (Forman 1995, Chen et al. 1995, Harper et al. 2005). Together, sun and wind: 1) desiccate leaves by increasing evapotranspiration; 2) influence which plant species survive and thrive along the edge, usually favoring shade-intolerant species; and 3) impact the soil, insects, and other animals along the edge. Compared to the forest interior, areas near edges receive more direct solar radiation during the day, lose more long-wave radiation at night, have lower humidity, and receive less short-wave radiation. However, such effects are dependent on such local conditions as orientation of an edge: the magnitudes of change in humidity with distance from an edge are most extreme with south-facing edges compared to east- and west-facing edges (Chen et al. 1995). These effects would vary along the pipeline route as a function of route orientation and the facing direction of each edge. Because the Pacific Connector pipeline generally trends from northwest to southeast, edge effects would be most pronounced on the southwest-facing edges and weakest along the northeast-facing edges. Fundamental changes in the microclimate (moisture, temperature, solar radiation) of a stand have been recorded greater than 700 feet from the forest edge (Chen et al. 1995).

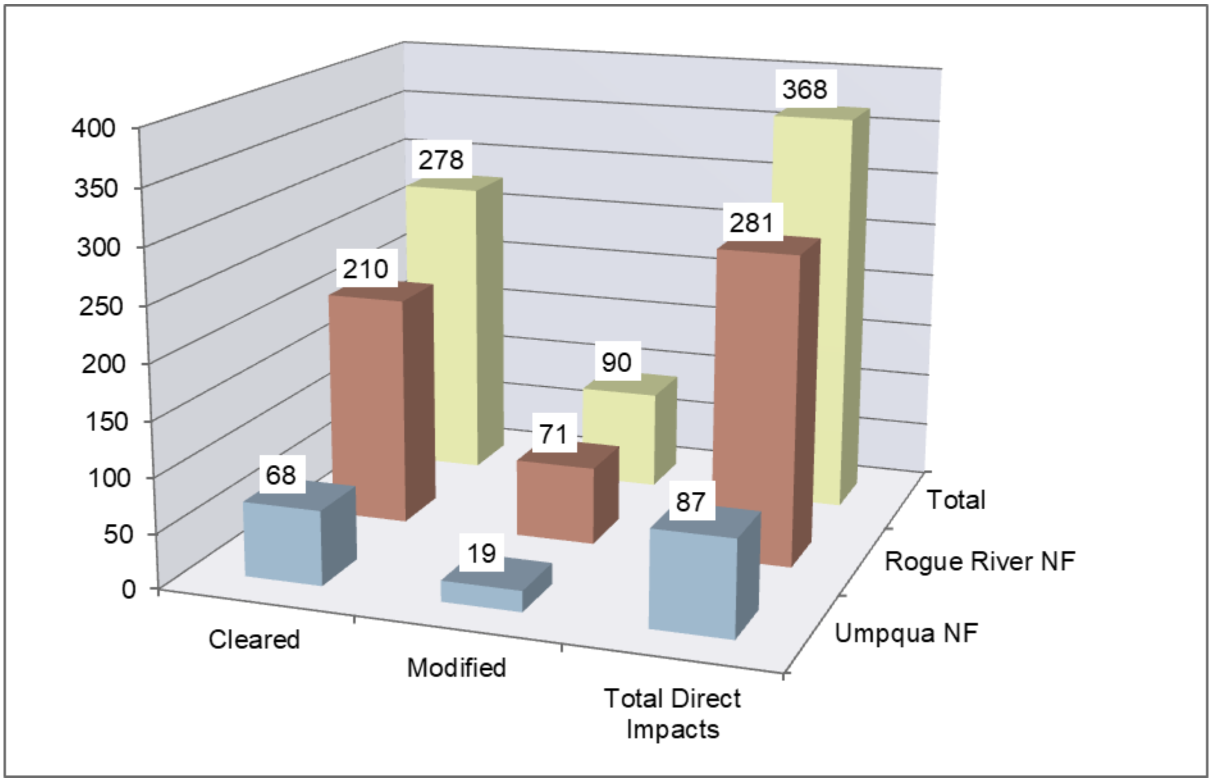
TABLE 1.3.2-1

Direct Effects[a] of the Proposed PCGP Project on Mapped LSRs (acres)

Forest	Cleared	Modified	Total Direct Effects
Umpqua NF	68	19	87
Rogue River NF	210	71	281
Total	**278**	**90**	**368**

a/ Direct effects include PCGP corridor clearing, TEWAs, and UCSAs
Data source: USFS, GIS layers

Figure 1.3-1. Direct Effects of the Proposed PCGP Project on Mapped LSRs (acres)



Using recommendations from the ESA Sub-Task Group and Habitat Quality Subtask Group[7], indirect effects are considered to extend for 100 meters from the created edge in LSOG forest. In making their recommendation, the sub-task groups considered the study done by Karen A. Harper et al., which looked at edge influence on forest structure in fragmented landscapes

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[7] These sub-task groups were part of an Interagency Task Force, which included representatives of the U.S. Fish and Wildlife Service and National Marine Fisheries Service, as well as USFS, BLM, Oregon Dept. of Land and Conservation Development, Oregon Dept. of Energy, Oregon Division of State Lands, Army Corps of Engineers, Oregon Dept. of Fish and Wildlife, Environmental Protection Agency, and the Oregon Dept. of Environmental Quality, to obtain specific input, guidance, and technical approach reviews. Agencies participating in the Interagency Task Force reviewed information provided by Jordan Cove Energy and Pacific Connector Gas Pipeline.

(Harper et al. 2005). The study reviewed the effects caused by forest edges on multiple response variables, including: 1) forest processes of tree mortality/damage, recruitment, growth rate, canopy foliage, understory foliage, and seedling mortality, 2) forest structure by canopy trees, canopy cover, snags and logs, understory tree density, herbaceous cover, and shrub cover, and 3) stand composition by species, exotics, individual species, and species diversity. The study found that the mean distance of edge influence on any single response variable did not exceed 300 feet (100 meters). Therefore, indirect effects for the project are estimated to extend for 100 meters beyond the cleared area on each side of the corridor in LSOG forest habitat. There is no corresponding research for edge effects in younger forest stands (less than 80 years old). There is, however, research that indicates indirect effects extend out approximately two times the average tree height (Morrison et al. 2002). Based on this research, an estimate of 30 meters is used in non-LSOG forest habitat. In non-forested areas, no indirect effects are estimated since no new edge would be created. Table 1.3.2-2 and figure 1.3-2 provide a summary of the total number of LSR acres that would be directly and indirectly affected on Forest Service lands by the PCGP project.

The construction, operation, and maintenance of the proposed PCGP project would affect LSRs on Forest Service lands in several ways. It would remove and fragment LSOG forest habitat that some vertebrate and invertebrate species depend on. It would directly affect individuals of species listed as threatened under the ESA through removal of suitable nesting, roosting, and foraging habitat for the NSO. The indirect effects discussed above would result in the loss of some interior LSOG forest habitat and increased predation. These impacts and others from the proposed construction, operation, and maintenance of the PCGP project on LSRs are discussed in the FERC Draft EIS and will also be discussed in the FERC-prepared biological assessments (BAs). The analysis in this report focuses on how the proposed amendments and mitigation actions would affect the LSR land allocation in terms of the distribution, quantity, and quality of LSOG habitat, and consistency with the LSR standards and guidelines.

Although there will be some impacts to interior forests these impacts have been minimized in LSR through the routing of the pipeline. As discussed in section 1.3.3.2 below, the Forest Service worked closely with the applicant to avoid interior forest by routing the pipeline where feasible on or near existing roads and timber harvest areas. Roads and harvest units create edge effects, as discussed above, in forested environments. Locating the pipeline on or near existing roads and harvest units avoids impacting interior forest from additional fragmentation. This is displayed in the maps in figures 1.3-3, 1.3-4a, and 1.3-4b in section 1.3.3.2 below.

TABLE 1.3.2-2

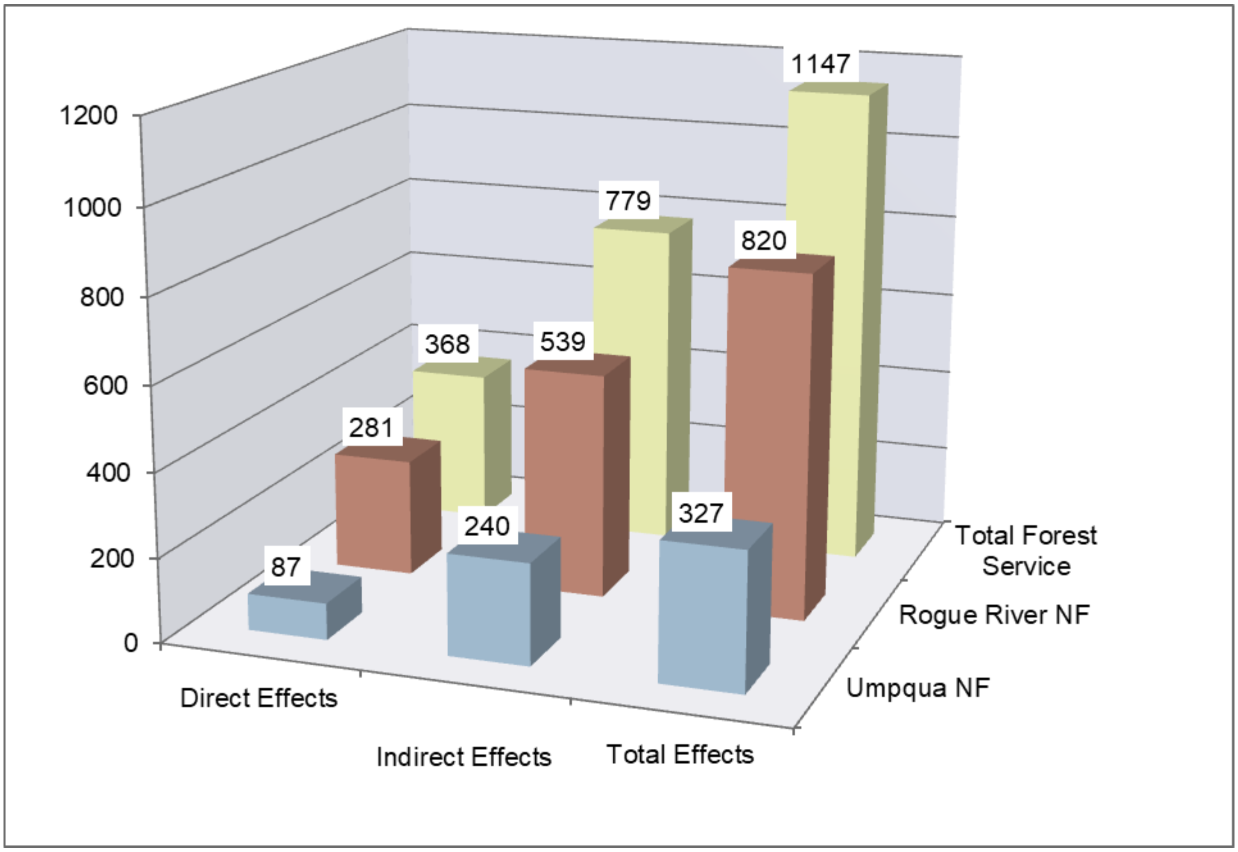
Summary of Total LSR Acres Directly and Indirectly a/ Affected by the Proposed PCGP Project

Forest	Direct Effects	Indirect Effects	Total Effects
Umpqua	87	240	327
Rogue River	281	539	820
Total Forest Service	**368**	**779**	**1,147**

Data source: USFS GIS data layers

a/ Direct effects include cleared acres (corridor and TEWAs) and modified acres (UCSAs). Indirect effects include 100 meters on each side of the cleared corridor edge in LSOG and 30 meters on each side of the cleared corridor edge in non-LSOG.

Figure 1.3-2. Summary of Total LSR Acres Directly and Indirectly Affected by the PCGP Project



1.3.3 The Need for Plan Amendments and Off-Site Mitigation in LSRs

Under the National Forest Management Act (NFMA), the proposed PCGP project would have to conform to Forest Service land use plans. Those plans incorporate the NWFP standards and guidelines, which allow new developments in LSRs on a case-by-case basis, provided certain considerations are taken. The standard and guideline for new developments in LSRs state;

> "Developments of new facilities that may adversely affect Late-Successional Reserves should not be permitted. New development proposals that address public needs or provide significant public benefits, such as powerlines, pipelines, reservoirs, recreation sites, or other public works projects will be reviewed on a case-by-case basis and may be approved when adverse effects can be minimized and mitigated. These will be planned to have the least possible adverse impacts on Late-Successional Reserves. Developments will be located to avoid degradation of habitat and adverse effects on identified late-successional species." (USDA and USDI 1994, page C-17)

To be consistent with this standard and guideline, the first consideration is to avoid affecting LSRs altogether. When that is not feasible, the second consideration is locating the project to minimize adverse impacts, and the third consideration is to mitigate or compensate for unavoidable adverse impacts. In order to be consistent with the standard and guideline above, considerations two and three would need to result in overall impacts that are either neutral or beneficial to the creation and maintenance of late-successional habitat in LSRs (USDA and USDI Memorandum 2001).[8]

1.3.3.1 Avoiding LSRs

Alternative routes that would avoid all LSRs were investigated by the applicant, Forest Service, and FERC. These alternatives would require lengthy rerouting both in terms of the overall length of the pipeline and in the amount of private land affected. These alternatives and the reasons why they were not carried further are discussed in section 10.4 of Resource Report 10 and in section 3.4 of FERC Draft EIS. The steps taken to avoid LSRs and how they were incorporated into the proposed route where feasible are also discussed in section 10.4 of Resource Report 10.

In summary, because the proposed project is a linear, large-diameter, high-pressure natural gas pipeline that must be routed to ensure safety, stability, and integrity, it is unreasonable, impractical, and infeasible to entirely avoid all designated LSRs within the project area for the following reasons:

1) The overall extent of the designated LSR land allocation in the project area makes it impractical to completely avoid LSRs;

2) The length of the proposed project, which extends approximately 230 miles from Coos Bay to Malin, Oregon, crosses Coos, Douglas, Jackson, and Klamath counties, and traverses public lands managed by three national forests, makes it impractical to avoid all designated LSRs;

3) Large, contiguous areas of federal lands in the project area make it impractical and infeasible to entirely route around these lands to avoid LSRs; and

4) Where LSRs are encountered along the alignment, the routing requirements of the proposed pipeline to ensure a safe, stable, and constructible alignment to ensure long-term integrity make it infeasible/unreasonable to avoid LSRs by aligning the pipeline on steep side slopes or other potentially unstable areas.

1.3.3.2 Minimizing Adverse Impacts

During the project route selection and construction footprint design process, interdisciplinary teams from the Forest Service worked with FERC and the applicant to develop steps that would minimize impacts to LSRs where avoidance was not feasible. In August 2006, the Forest Service requested that FERC study an alternative route over portions of the Rogue River and Fremont-Winema NFs. This suggested route variation mostly followed existing Forest Service roads. In late September 2006, Pacific Connector met with the Forest Service to discuss the

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[8] The introduction to the Standards and Guidelines for Multiple-Use Activities Other Than Silviculture stated; “As a general guideline nonsilvicultural activities located inside Late-Successional Reserves that are neutral or beneficial to the creation and maintenance late-successional habitat are allowed” (NWFP page C-16). The 2001 memorandum provides the detailed guidance for considering new developments in LSR including the “neutral to beneficial” standard.

variation, as well as to explain project construction requirements. As a result of consultations with the Forest Service, Pacific Connector modified its original May 2006 route to adopt segments of the USFS suggested variation, and incorporated the modified route into its current proposed route. The following features have been incorporated into the proposed route and construction design:

- Performing routing and geotechnical evaluations to ensure the most stable pipeline alignment for long-term stability. These efforts would minimize the potential need to conduct future maintenance activities, which could require additional impacts to LSRs.
- Where feasible, the proposed alignment was co-located with existing roads and early-seral conifer plantations to reduce impacts to LSOG habitat and to minimize disturbance impacts. Figures 1.3-3, 1.3-4a, and 1.3-4b below display the location of the PCGP project in relation to roads and harvest units within 1 mile on either side of the pipeline in LSR.
- Areas of side slopes were avoided to minimize the need for additional TEWAs to accommodate the necessary cuts and fill to safely construct the pipeline.
- The number and size of the planned TEWAs in LSRs were minimized to those critical for safe pipeline construction.
- Additional TEWAs were located in previously disturbed areas (i.e., areas that were recently logged) or in young, regenerating forest stands.
- Existing roads would be used to access the construction right-of-way during construction, and the right-of-way would be used as the primary travel-way to move equipment and materials up and down the right-of-way to remove the need for additional roads within LSRs. The existing roads would also be used during operations and maintenance to avoid the need for new access routes.
- Pacific Connector would replant or allow trees to naturally regenerate to within 15 feet of the pipeline centerline within the permanent pipeline easement to minimize the potential long-term effects of the pipeline easement.

Detailed descriptions of the conservation measures proposed by the applicant are included in Resource Report 3 and in the Plans of Development (final EIS appendix F.10).

Figure 1.3-3. Location of the PCGP project in Relation to Roads and Harvest Units in LSR 223 on the Umpqua NF.

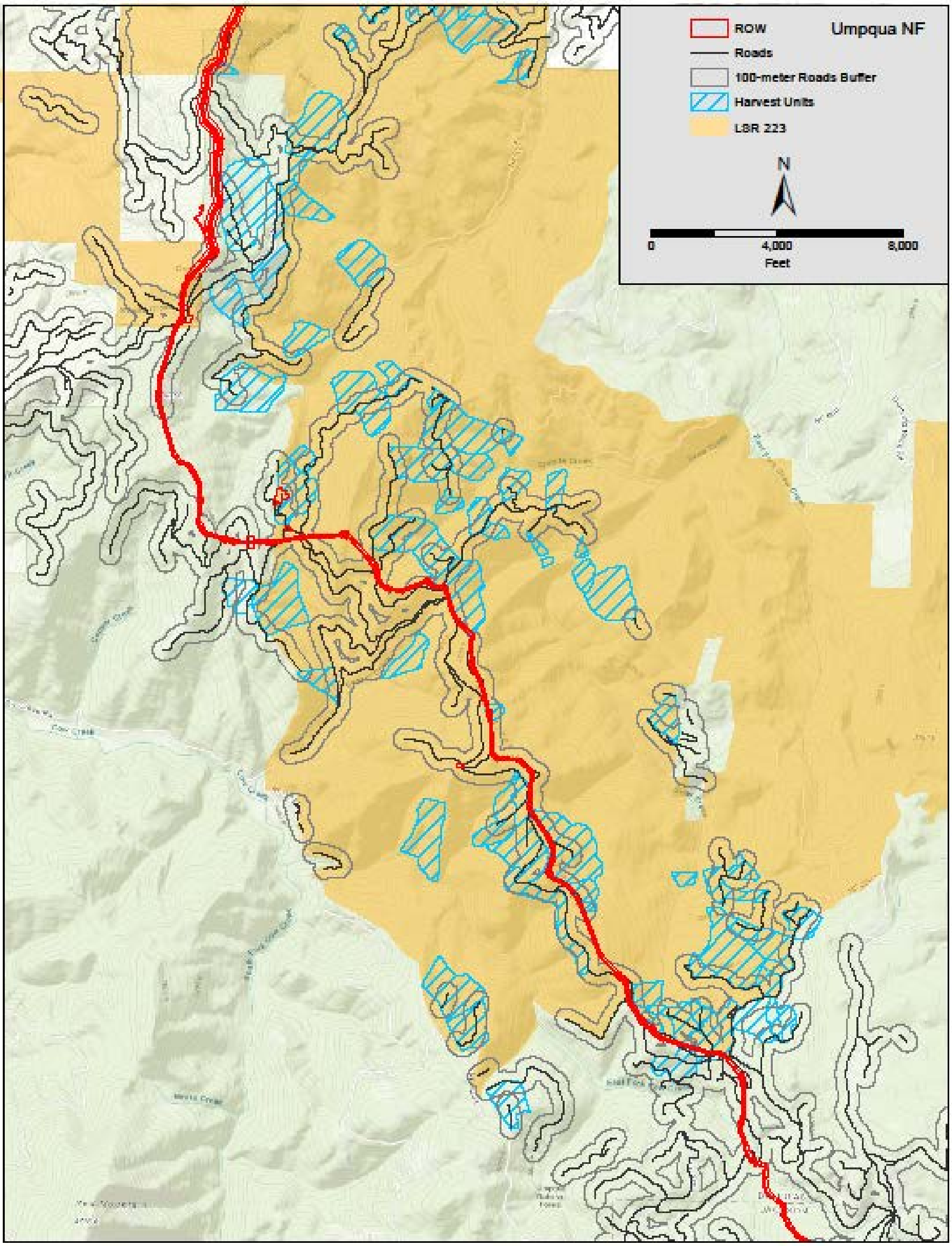


Figure 1.3-4a. Location of the PCGP project in Relation to Roads and Harvest Units in LSR 227 on the Rogue River NF (western portion).

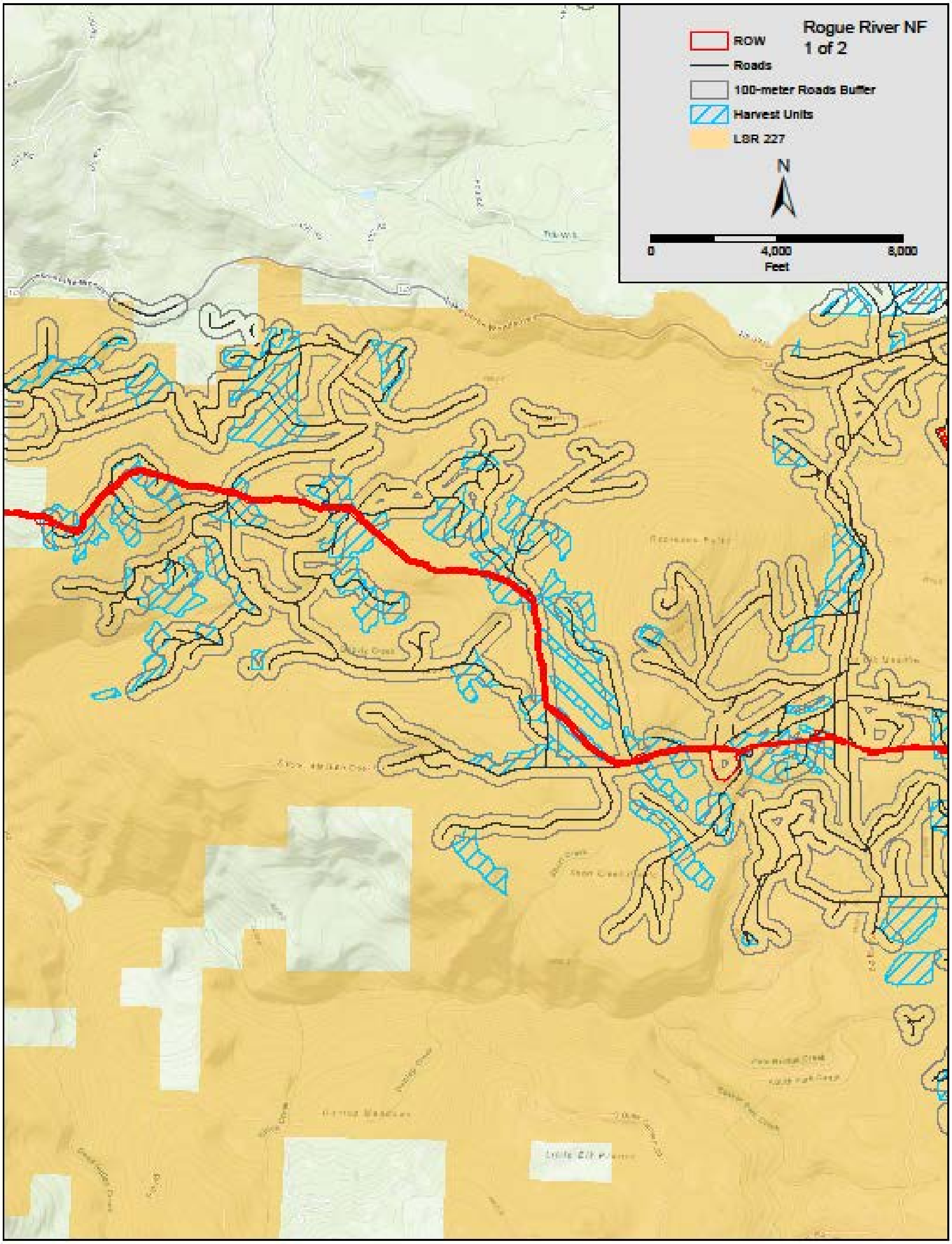
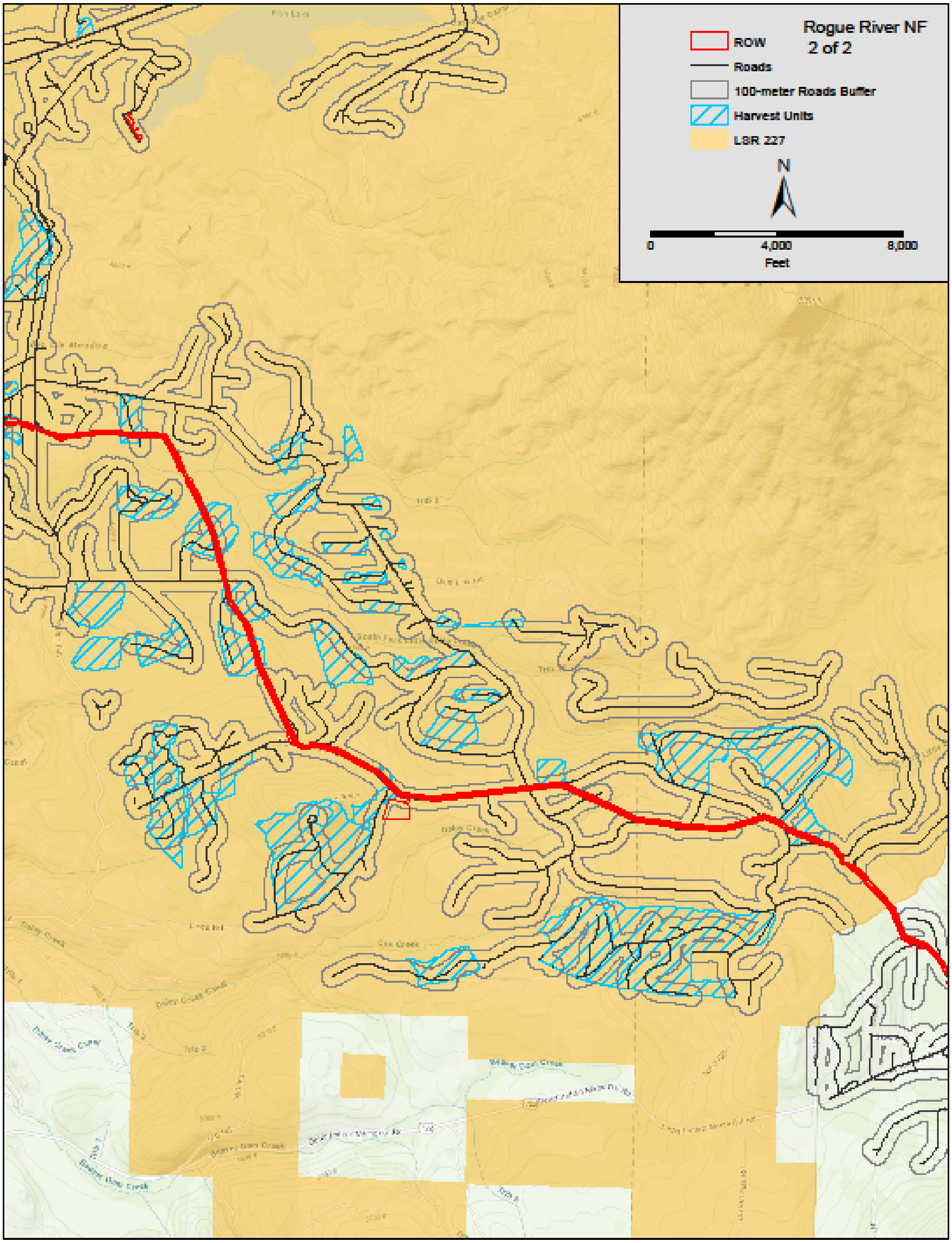


Figure 1.3-4b. Location of the PCGP project in Relation to Roads and Harvest Units in LSR 227 on the Rogue River NF (eastern portion).



1.3.3.3 Mitigation for Unavoidable Adverse Impacts

In addition to avoidance and minimization, off-site mitigation has also been proposed to ensure that unavoidable adverse impacts are mitigated to meet the requirement that the overall impact would be either neutral or beneficial to the creation and maintenance of late-successional habitat in LSRs. A Compensatory Mitigation Plan (CMP) on Forest Service lands has been developed by the agency for the PCGP project. A portion of the CMP was developed specifically to compensate for the unavoidable adverse impacts of the project on LSRs to achieve a neutral or beneficial condition within affected LSRs and to maintain the long-term integrity of the Forest Service land use plans for LSRs. Under the CMP, unavoidable impacts to LSOG forest habitats within LSRs on Forest Service lands would be compensated for by a combination of reallocation of matrix lands to LSR and implementing off-site mitigation projects. The off-site mitigations for stand treatments and fuel breaks are intended to implement the recommendations contained in the LSRAs for LSR 223 and LSR 227. Stand treatments would enhance or accelerate the development of LSOG habitat elements to further offset the effects of the PCGP project on LSRs in the long term (long term is longer than the expected life of the project or greater than 50 years). Fuel breaks integrated with stand density management would help reduce the risks of LSOG forest loss to catastrophic wildfires. The off-site mitigation actions would also increase the effectiveness of the LSOG forest habitat added to LSRs by improving the quantity, quality, and distribution of high-quality habitat.

A longer, hotter, and drier fire season is projected for the Pacific Northwest under future climate scenarios, and the area burned by wildfires is projected to increase as a result (Wimberly et. al. 2014). Fuel management is an important component of current efforts to restore fire-resilient forest structure and mitigate the negative consequences of wildfires in the dry forests of the Pacific Northwest. It is expected that treatment of hazardous fuels will continue to play a major role in mitigating fire risk and conserving biodiversity in future climates characterized by more wildfires (Spies et al., 2006, 2010). The NWFP initiated a significant reduction in the harvesting of older forests on federal land. Harvest reductions on federal forests, which cover half of the region, resulted in a significant regional drop in the loss of late-successional forest to harvest. However, increased losses of late-successional forest to fire outweighed reductions in harvest across large areas of the region (Healey et. al. 2008, Spies et. al. 2019). The integrated fuel treatments in the CMP have been designed by interdisciplinary teams of resource professionals to reduce the risk of the loss of LSOG forest to stand-replacing wildfire.

There is presently no funding for any of these proposed projects and none is foreseeable. Also these mitigation actions have been proposed in the LSRs and watersheds that would be impacted by the project. If restoration funds did become available to the USFS it is likely that there would be areas of higher priority for those funds. The projects would be funded by the applicant (including any planning costs) and would be enforced through conditions in the Right-of-Way grant. A central provision of the Forest Service CMP is that it is to remain adaptable to new information and changed conditions. The CMP projects related to LSR are discussed in sections 2.1 and 2.2 below.

The primary mitigation action for the effects of the proposed pipeline on LSRs would add acres to the LSRs. The Forest Service is proposing to accomplish this through reallocation of matrix lands to LSR. Reallocating these acres will require amendments to the Umpqua and Rogue

River NF LRMPs.[9] The analysis in the following sections examines the acres of habitat (by habitat type of LSOG, non-LSOG, and non-forest) that would be cleared by the project, with the amount of habitat that would be reallocated since this would the most direct comparison of acres affected in the LSR system. Table 1.3.3-1 and figure 1.3-3 display a summary comparison between the LSR acres that would be cleared by the construction of the PCGP project and the proposed reallocation of matrix lands to LSR. Amendments concerning LSRs associated with the PCGP project have been coordinated with the Regional Ecosystem Office as required by the Northwest Forest Plan.[10]

TABLE 1.3.3.3-1

Comparison of Total LSR Acres Cleared a/ by the PCGP Project and the Acres of Matrix Reallocated to LSR

	LSR Habitat Affected by PCGP Construction Clearing			**LSR Mitigation**
Forest	**LSOG Habitat**	**Non-LSOG Habitat**	**Total LSR Clearing**	**Matrix to LSR Reallocations**
Umpqua NF	20	48	68	585
Rogue River NF	52	158	210	522
Total	**72**	**206**	**278**	**1,107**

Data source: USFS GIS data layers
a/ Clearing includes acres in the PCGP corridor and the TEWAs

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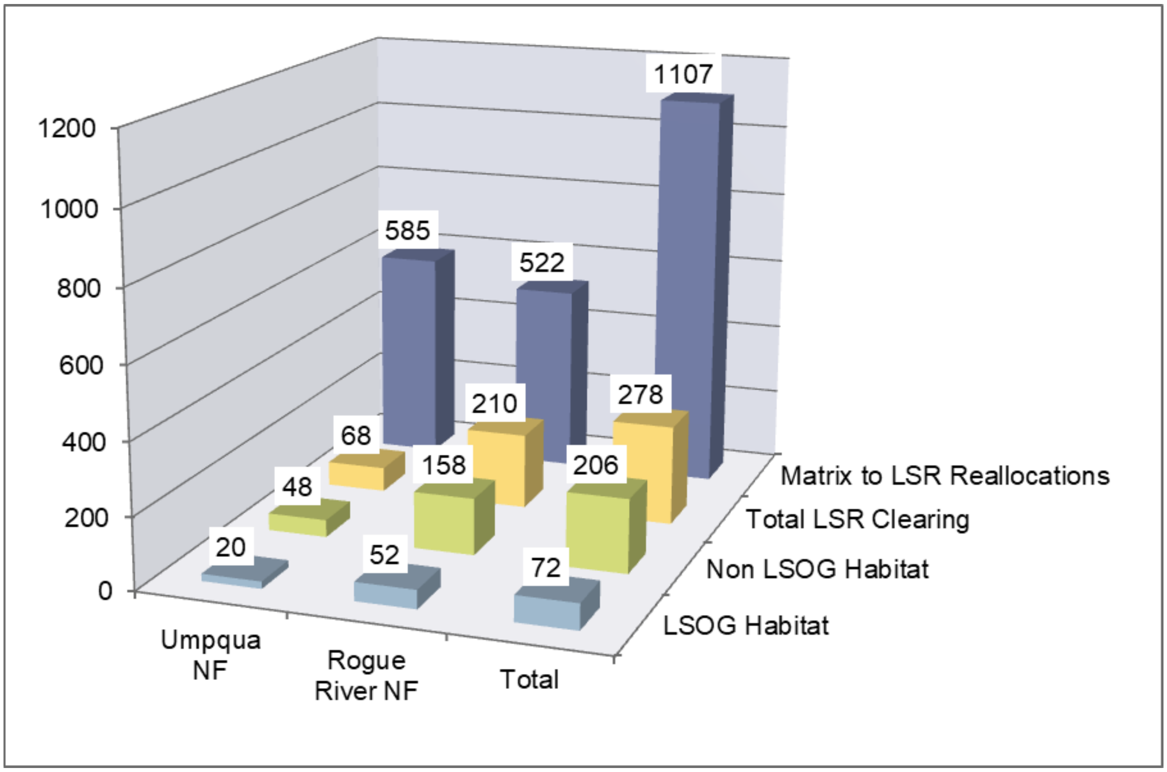
[9] Evaluations of these proposed amendments and how they relate to the planning requirements in the Forest Service planning rule at 36 CFR 219 (2012 Version) is discussed in Section 4.7.3.4 of the final EIS and in Appendix F.2.

[10] A submission package was sent to the Regional Interagency Executive Committee (RIEC) on June 28, 2019. A response to the RIECs comments was sent by Forest Supervisor Alice Carlton in October 2019, which concluded the RIEC review process (October 28, 2019, 2600 memo to Glen Casamassa, Chair, Regional Interagency Executive Committee).

Figure 1.3-5. **Comparison of Total LSR Acres Cleared by the PCGP Project and Total Acres of Matrix Reallocated to LSR**



2.0 LSR CROSSED BY THE PCGP PROJECT

The proposed PCGP project would cross LSRs on two national forests (Umpqua and Rogue River), for a total of approximately 31 miles. Figure 1.3-1 provides an overview of the proposed project and the management units of the Forest Service. Table 1.3.2-2 displays the total acres of LSR that would be affected in each management unit of the Forest Service. The remainder of this section will address the PCGP project in LSR on the Umpqua and Rogue River NFs.

2.1 UMPQUA NF LSR 223

The Umpqua NF LRMP as amended guides all resource management activities, establishes management standards and guidelines, and serves as the primary land management plan for the Umpqua NF. Amendments to the Umpqua NF LRMP include the NWFP and the inclusion of LSRs (see section 1.2.3 above). Goals and Objectives, Standards and Guidelines, and Management Prescriptions are found in Chapter Four. Management direction in Chapter Four may be changed by amending the Forest Plan. The Umpqua NF LRMP is available at http://www.fs.usda.gov/detailfull/umpqua/landmanagement/?cid=fsbdev3_056190&width=full.

The proposed PCGP project would cross approximately 5.0 miles of LSR 223 on the Umpqua NF and construction of the project would directly affect (acres cleared plus acres modified) approximately 87 acres of LSR 223.[11] A map of the proposed PCGP project and LSRs in the Umpqua NF is displayed in figure 2.1-1. The map in figure 2.1-1 demonstrates that the PCGP project would not affect KOACs in the Umpqua NF.[12] Therefore the proposed PCGP project does not alter any unmapped LSR areas in the Umpqua NF.

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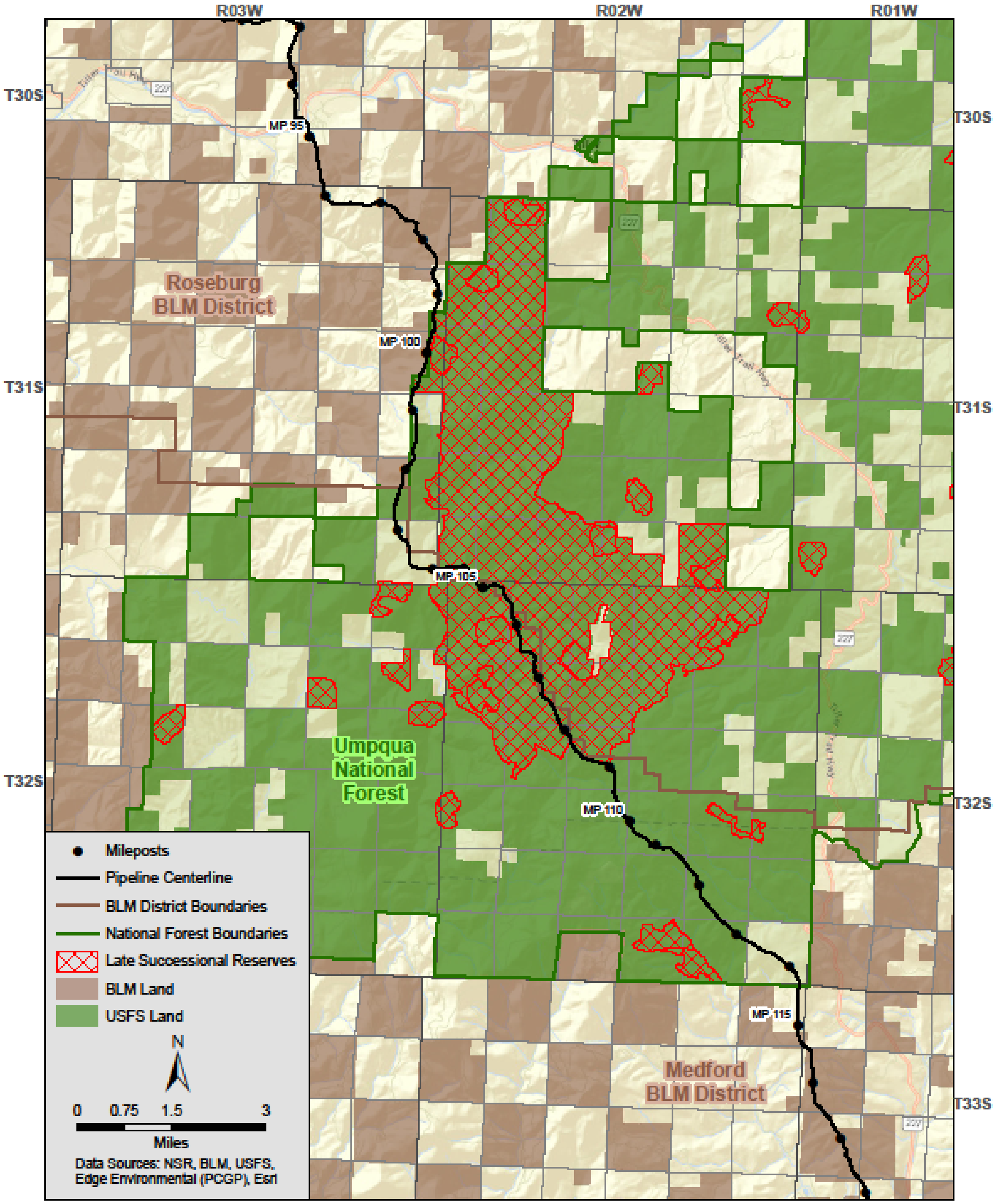
[11] Acreages are slightly different from those in the DEIS due to minor reroutes (see Section 3.4.2 of the Final EIS).

[12] There is no MAMU habitat in the Umpqua NF due to its distance from the ocean.

Figure 2.1-1. **Map of Proposed PCGP Project and LSRs in the Umpqua NF**



2.1.1 Mapped LSR 223 in the Umpqua NF

2.1.1.1 Summary from LSRA

The South Umpqua River/Galesville Late-Successional Reserve Assessment (USDA and USDI 1999) originally addressed one LSR in the Roseburg and Medford Districts of the BLM and the Umpqua NF totaling about 66,900 acres. This LSR is a major habitat link between the Coast Range and Cascade Provinces. The BLM lands are no longer included in this NWFP LSR as a result of the new 2016 Resource Management Plans for western Oregon. The BLM lands, however, are included in new land allocations that are dedicated to maintaining and developing habitat for the northern spotted owl and marbled murrelet (USDI 2016). The information and recommendations contained in the LSRA remain relevant in addressing LSR function, proposed LRMP amendments, and compensatory mitigation actions on the Umpqua NF.

This LSR lies in a critical east-west connectivity area between two large valley systems. To the south is the Rogue River valley and to the north is the Umpqua valley. North and south of this LSR, there are essentially no neighboring LSRs. The LSR is located at the south end of the Umpqua valley in a landscape dominated by intermingled BLM and private lands. To the east and southeast of the LSR, there is a block of Forest Service lands. The lack of federal ownership across the I-5 corridor in most of western Oregon makes this area a vital link between major physiographic provinces.

Vegetative conditions, past and present, have been influenced by environmental and human factors. Late-successional stands are estimated to have historically covered from 40 to 75 percent of southwestern Oregon (USDA 1993). The objective for management in this LSR is to attain and maintain 60 percent to 75 percent of the federal lands in late-successional stands.

Three general landscape criteria were identified for setting priorities for the locations of future treatment areas. These included maintaining or enhancing connectivity across the landscape, establishing large blocks of late-successional habitat, and enhancing suitable spotted owl habitat conditions around centers of activity.

The risk of large-scale habitat loss from a wildfire occurring within this LSR is relatively high. The historic fire-return level for the LSR is on the order of 30 to 80 years. The primary objective of fire and fuels management in the LSR is to minimize the loss of late-successional habitat by reducing the risks of high-intensity, stand-replacing wildfires.

The objective of silvicultural systems proposed for this LSR would be to develop old-growth characteristics, including snags, downed logs, large trees, canopy gaps, multiple layers, and diverse species composition. Silviculture treatments, such as reforestation, release, density management, pruning, fertilization, and tree culturing to accelerate the development of desired characteristics, could occur within the LSR

Fire has been a significant if not the dominant factor in maintaining the compositional and structural diversity of the area, as well as fragmenting the late-successional forests. The intensity of fires has varied based on elevation, aspect, and vegetation zones. Forests of all vegetation zones have burned, though the return intervals have been different. The zones in the lower elevations probably had more frequent fires than the Douglas-fir and other conifer-dominated types at higher elevations. Not only were the fuel characteristics more conducive to frequent fires, but the lower elevations probably experienced more frequent human-caused fires as Native Americans burned the valleys and foothills for their own uses. Fire exclusion and the continued suppression of fires became effective around the 1940s. Fire exclusion has resulted in the development of stands that would not have occurred naturally. In some stands, shade-tolerant understories have seeded in that would have otherwise been kept out by frequent low-intensity fires. This is particularly so at the higher elevation zones where white fir has become a more common understory species.

As stated above, the risk of large-scale habitat loss from a wildfire event occurring within this LSR is relatively high. Fuels and ignition sources are present. The NWFP recognizes that the Oregon Klamath Physiographic Province has an increased fire risk due to lower moisture conditions and rapid accumulation of fuels after insect outbreaks and drought. Fire suppression and exclusion have caused fuels to accumulate to a point that they are outside the range of “historic” variability. Many stands are currently overstocked with conifers, hardwoods, and shrubs.

2.1.1.2 Recent Changes Since the LSRA Was Written

In August and September 2015, the Stouts Creek Fire burned approximately 26,452 acres in the vicinity of the proposed PCGP alignment between MP 95 and MP 109. Approximately 14,251 acres of the burn occurred on the Umpqua NF, of which approximately 10,087 acres occurred within LSR 223. Approximately 9,172 of the acres that were burned on the Umpqua NF were in the low/unburned to low fire intensity class, and approximately 5,079 acres were in the moderate to high fire intensity class (Silva 2015). Field investigations confirmed that the moderate to high fire intensity classes represented a stand-replacement fire (Silva 2015). The amount of moderate to high fire intensity that occurred within LSOG habitat within LSR 223 was approximately 1,190 acres. Although these acres of burned LSOG represented stand-replacement fire it was determined that the acres would continue to function as foraging habitat for the NSO due to the remaining structure within the stands and the mosaic pattern of the burn in this area.[13] In addition to the downgrading of nesting, roosting and foraging (NRF) habitat to foraging habitat, approximately 1,766 acres of non-LSOG habitat were lost to stand-replacement fire in LSR 223. Although this did not affect the amount of LSOG habitat within the LSR, it does represent a loss of recruitment habitat that would have developed into LSOG in the coming years. It will now be 80 or more years before these areas attain LSOG habitat characteristics.

In addition to the effects of the fire, there were also impacts to LSR 223 from fire suppression activities. An approximately 100-foot-wide fire break was created between MP 105.4 and 108.9 of the PCGP project. This fire break occurred along the ridge that corresponds to the location of the pipeline. This constructed fire break removed approximately 29 acres of forest within LSR 223, of which approximately 3 acres was LSOG (see attachment 1 of this report).

It should be noted that not all of the effects of the Stouts Creek Fire were adverse in relation to the creation and maintenance of late successional habitat within LSR 223. At a landscape scale, there is an increase in forest resiliency as a result of understory fuels reduction in areas of low fire severity. As noted in the LSRA, high fuel loadings above historic levels was one of the main

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[13] Personal communication with David Krantz Forest Service PCGP project coordinator and email from Justin Hadwen wildlife biologist

contributing factors to the high risk of stand-replacement fire in this area. Low and unburned fire severities composed a larger proportion of the fire than moderate and high levels in LSR 223 on the Umpqua NF. There may also be beneficial effects to late-successional species due to the mosaic burn pattern of the fire which creates canopy openings, edge habitats, and large-diameter snags. The burned area also promotes herbaceous/woody hardwood growth and provides for future large woody debris (LWD) on the forest floor. All of these can be important habitat features for prey base species that late successional species such as the NSO depend on (Bond et al. 2009).

Little other activity has occurred in LSR 223 in the Umpqua NF since the LSRA was written in 1999. Approximately four other small wildfires have occurred, but each was less than 10 acres. There have been several fuels treatments (thinning and pile-burning) on a total of approximately 136 acres. There has also been some precommercial thinning of young stands of timber on approximately 93 acres[14].

2.1.2 Proposed LRMP Amendments and Mitigation Actions Relevant to LSR 223

2.1.2.1 LRMP Amendments

The Forest Service proposes to amend the Umpqua NF LRMP as follows:

UNF-4, Reallocation of Matrix Lands to Late Successional Reserves[15]

The Umpqua NF LRMP would be amended to change the designation of approximately 585 acres from the matrix land allocation to the LSR land allocation in Sections 7, 18, and 19, T.32 S., R. 2 W., Oregon; and Sections 13 and 24, T. 32 S., R. 3 W., W. M., Oregon.

This change in land allocation is proposed to partially mitigate for the potential adverse impact of the PCGP project on LSR 223 in the Umpqua NF. This amendment would change future management direction for the lands reallocated from matrix to LSR. The proposed reallocation is displayed in figure 2.1-2.

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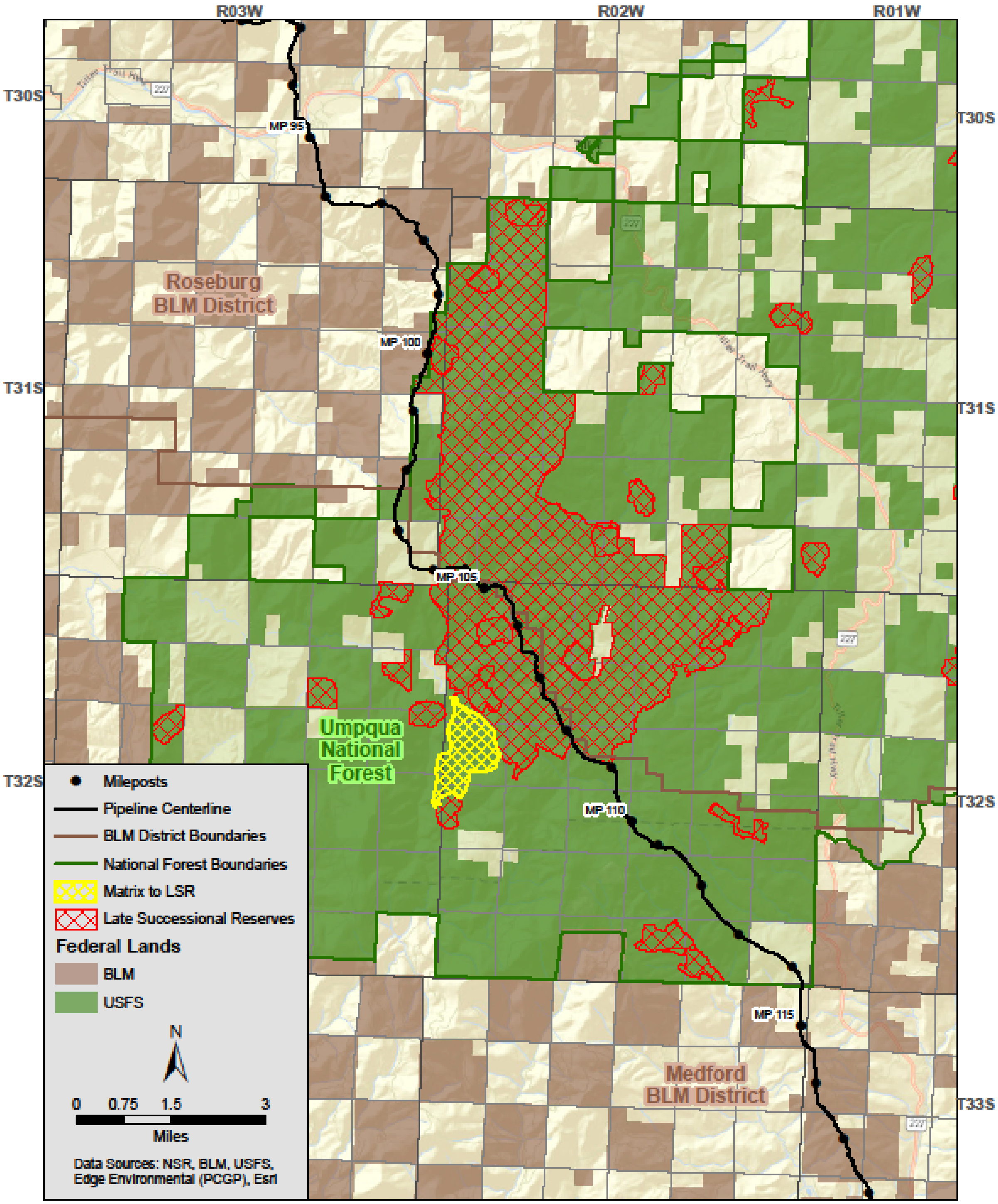
[14] Personal communications with Wes Yamamoto, former Forest Service PCGP project coordinator

[15] Evaluations of this proposed amendment and how it relates to the planning requirements in the Forest Service planning rule at 36 CFR 219 (2012 Version) are discussed in Section 4.7 of the Draft EIS and in Appendix F2.

Figure 2.1-2. Proposed Matrix to LSR Reallocation, Umpqua NF



2.1.2.2 Mitigation Actions

A compensatory mitigation plan[16] has been developed by the Forest Service and submitted to the PCGP project applicant to ensure that the goals and objectives of the LRMP related to LSR would be achieved. Mitigation actions include:

- Creation of snags on 190 acres that are below desired snag densities for LSRs.
- Placing CWD [coarse woody debris] on 164 acres in units that are currently below desired levels for CWD.
- Decommissioning 5 miles of roads to reduce fragmentation and develop interior stand habitat over time.
- Thinning approximately 247 acres of overstocked stands to reduce fire risk and accelerate development of LSR characteristics.
- Integrated stand density and fuel break treatments on 898 acres in LSR 233 to restore stand density, species diversity, and structural diversity and to control the spread and intensity of wildfire within forested stands prone to fire activity.
- Other proposed mitigation actions in LSR 223 include 80 acres of meadow restoration, 301 acres of off-site pine removal, 6 miles of noxious weed treatments, fish passage improvement at two sites, 5 miles of road stormproofing, and one water source improvement.

While the primary mitigation action for the effects of the proposed pipeline on LSR 223 would be to replace affected acres with additional acres of LSOG forest habitat that are currently outside of the LSR, the additional off-site mitigation actions proposed are consistent with the recommendations in the LSRA for LSR 223. These off-site mitigation actions would accelerate the development of LSOG forest habitat elements to further offset the effects of the PCGP project on LSR 223 in the long term. The additional off-site mitigation actions would also increase the effectiveness of the additional LSOG forest habitat added to LSR 223 by improving the quantity, quality, and distribution of high-quality habitat. Figure 2.1-3 displays where the proposed mitigation actions would occur.

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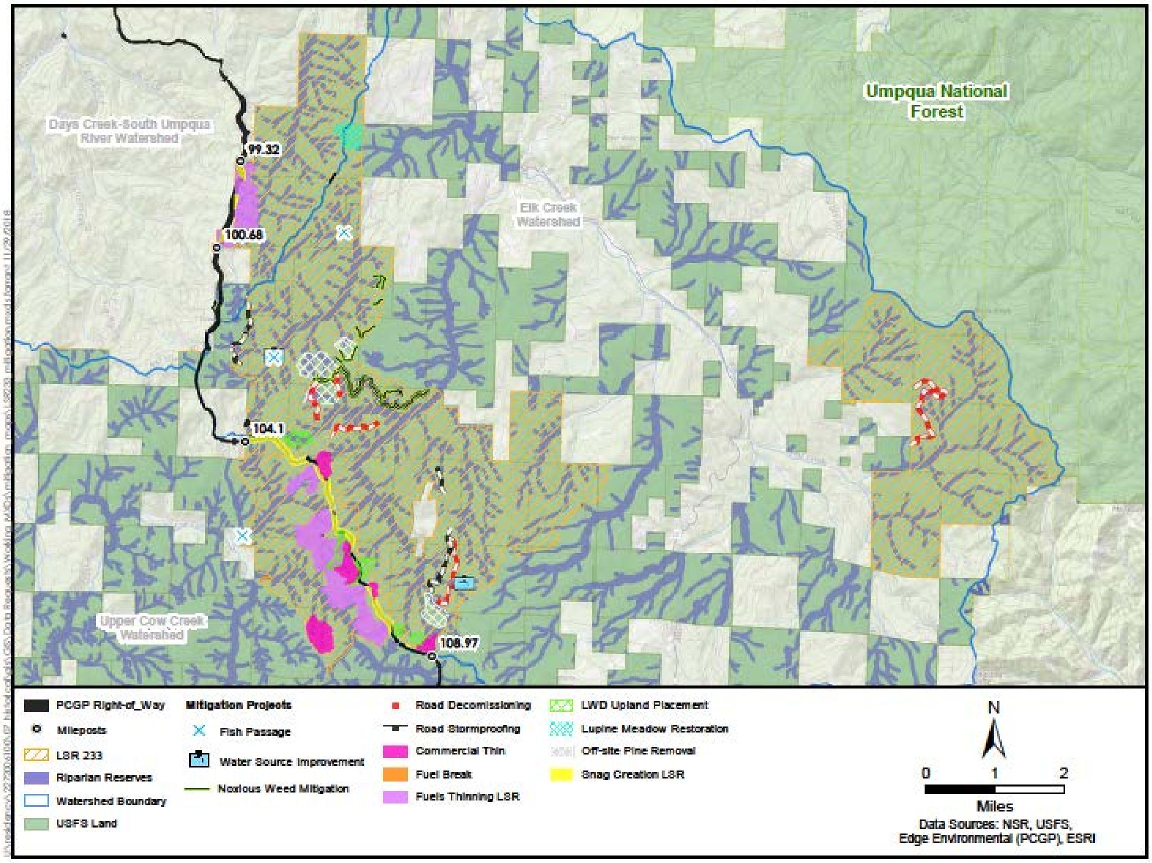
[16] This mitigation plan has been modified from the previous plan included in the 2015 FEIS for the PCGP project. In November 2015, representatives of Stantec conducted field surveys of the Stouts Creek Fire and met with interdisciplinary resource teams from the Umpqua NF in 2018 to revise the mitigation actions based on the changed conditions in LSR 223 as a result of the Stouts Creek Fire.

Figure 2.1-3. Proposed Off-Site Mitigation Actions in LSR 223



2.1.3 Impacts Related to the Proposed Amendments and Mitigation Actions Relevant to LSR 223

2.1.3.1 LRMP Amendment

One LRMP amendment related to LSR is proposed for the Umpqua NF.

UNF-4, Reallocation of Matrix Lands to LSR

The primary management objective of the LSR land allocation is to protect and enhance conditions of late-successional and old-growth forest ecosystems that serve as habitat for late-successional and old growth–related species.

If constructed, the portion of the PCGP project in the Umpqua NF would be about 10.8 miles long, of which about 5.0 miles would traverse through LSR 223. The PCGP project would clear approximately 68 acres in LSR 223, of which approximately 20 acres are LSOG forest[17]. The area proposed to be reallocated to LSR 223 is approximately 585 acres of matrix lands, of which

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[17] Although approximately 2 of the 20 LSOG acres were burned in a stand-replacement fire (2015 Stouts Creek Fire), it was determined that the acres would continue to function as foraging habitat for the NSO. Therefore, the clearing of these burned LSOG acres is considered to be a loss of LSOG habitat in this analysis.

approximately 296 acres are LSOG forest. This change in land allocation is proposed to partially mitigate for the potential adverse impact of the PCGP project on LSR 223 in the Umpqua NF. The proposed reallocation is shown in figure 2.1-2. When acres reallocated from matrix lands to LSR are compared to the acres of LSR that would be cleared by the PCGP project, the proposed amendment would reallocate over eight times more acres to LSR than would be cleared for the project corridor (see table 2.1.3.1-1 and figure 2.1-4, below).

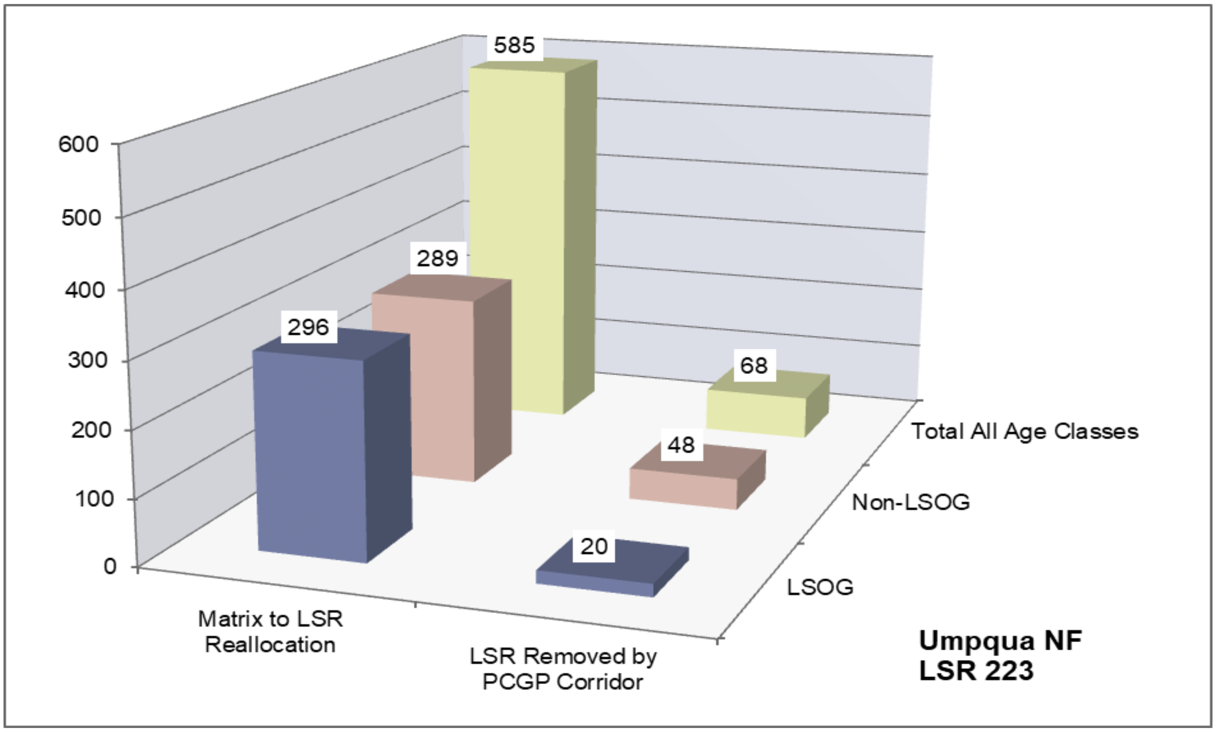
TABLE 2.1.3.1-1

Comparison of LSR Acres Cleared a/ by the PCGP Project and Acres of Matrix Reallocated to LSR

Umpqua NF LSR 223	LSOG	Non-LSOG	Non-Forest	Total All Age Classes
Matrix to LSR Reallocation	296	289	0	**585**
LSR Cleared by PCGP Corridor	20	48	0	**68**

a/ Acres cleared include corridor clearing and TEWAs.
Data source: BLM, USFS GIS data layers, Cox 2010

Figure 2.1-4. Comparison of Acres of LSR Cleared by the PCGP Project and Acres of Matrix to LSR Reallocation



In addition to the impacts from the removal of forest vegetation in LSR 223, there would be additional impacts from the acres modified by UCSAs and the acres indirectly affected through the creation of new edges and fragmentation of older forest. A comparison of the total acres affected in LSR 223 and the acres of reallocation are displayed in table 2.1.3.1-2 and figure 2.1-5.

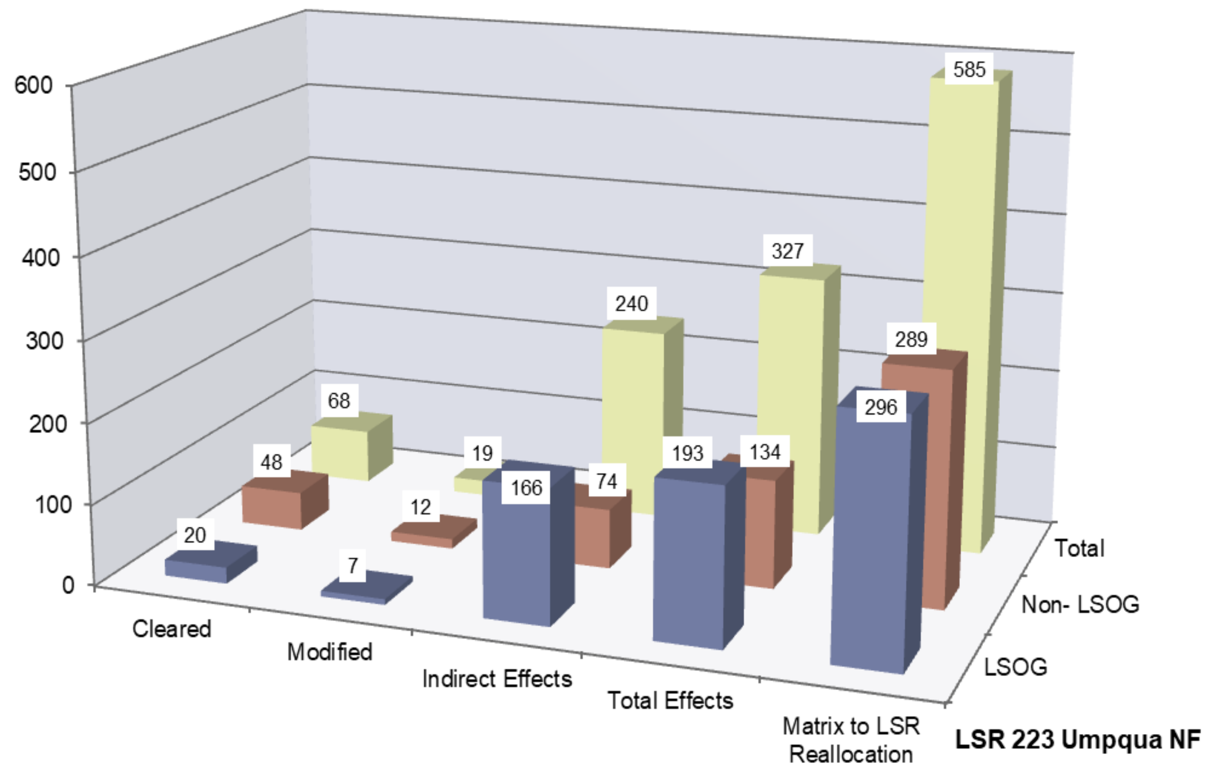
TABLE 2.1.3.1-2

Comparison of LSR 223 Acres Affected a/ by PCGP Project and Acres of Matrix Reallocated to LSR

Umpqua NF LSR 223	Cleared	Modified	Indirect Effects	Total Effects	Matrix to LSR Reallocation
	Direct Effects				
LSOG	20	7	166	193	296
Non-LSOG	48	12	74	134	289
Non-Forest	0	0	0	0	0
Total	**68**	**19**	**240**	**327**	**585**

a/ PCGP total effects include cleared acres (corridor and TEWAs), modified acres (UCSAs), and indirect effect acres (100 meters on each side of the cleared corridor edge in LSOG and 30 meters on each side of the cleared corridor edge in non-LSOG).
Data source: BLM, USFS GIS Data Layers, Cox 2010

Figure 2.1-5. Comparison of Total LSR 223 Acres Affected by PCGP Project and Acres of Matrix Reallocated to LSR



In addition to the impacts of the PCGP corridor on LSR 223 in the Umpqua NF, there are also potential impacts to LSR 223 from road improvements that may be necessary to accommodate the trucks that would construct the pipeline. These trucks are longer than typical trucks that use forest roads, and some road widening and curve realignment may be necessary to safely allow for this truck traffic. However, in LSR 223 on the Umpqua NF, it is estimated that only 0.01

acres of road improvements would occur. Although road improvements would occur to the extent possible within the existing clearing limits, it is possible that some additional clearing of forest vegetation would be necessary to accommodate the road improvements (see Transportation Management Plan of Development in Appendix F.10 for additional details).

2.1.3.2 Mitigation Actions

To compensate for the direct and indirect effects associated with the PCGP project in the LSR land allocation, off-site mitigation actions have been developed by the Forest Service (see figure 2.1-3). These proposed off-site mitigation actions include:

- Accelerating development of larger trees by precommercial thinning of young stands.
- Replacing constituent elements of habitat by placing LWD in units, creating snags, controlling noxious weeds, and restoring meadows.
- Reducing the risk of stand-replacing fire by stand-density management, commercial thinning, and fuels reduction treatments.
- Reducing habitat fragmentation by decommissioning roads and accelerating the development of interior stand conditions by stand-density management.

The off-site mitigation actions would increase the effectiveness of the LSOG forest habitat by improving the quantity, quality, and distribution of LSOG forest habitat. These off-site mitigation actions are consistent with the LSRA for LSR 223.

Road Decommissioning (5 miles)

Although the PCGP project has been routed to avoid LSOG habitat as much as possible, the project would create edge effects that would affect interior stand microclimates and cause habitat fragmentation within LSR 223 that cannot be avoided. Edge is the effect of an opening on the microclimate in adjacent stands (Chen, Franklin et al. 1993). Edge effects introduced by roads (or corridors) are highly variable and depend on aspect, road width, vegetation crossed, and other variables. Edge effects are greatest when there is a high contrast in structure and composition between a newly created opening and the adjacent landscape (Harper, Macdonald et al. 2005). Thus, edge effects are greatest when they affect interior stand habitats of older forests and lowest when the new opening is similar to the surrounding landscape, such as adjacent to an existing road or in a recent clearcut.

Decommissioning roads with appropriate restoration measures would presumably reverse edge effects and habitat fragmentation caused by existing roads and create habitat for a variety of animals (Switalski, Bissonette et al. 2004). The effect of edge reduction by road decommissioning is highly variable for the same reasons described for the edge effects created by constructing a road. Agency field experience has shown that road decommissioning reduces the edge effects over time by revegetating road surfaces and eliminating road corridors. Revegetating selected roads in conjunction with the density management proposed for adjacent plantations would block up forested habitat and reduce edge effects and fragmentation in a period of about 40 years as planted trees become pole sized (5 to 9 inches diameter at breast height (dbh) and 20 to 40 feet tall).

Published data on the rate and pattern of edge reduction associated with decommissioning roads is not available (Baker 2011), but a comparison of the predicted beneficial effect of road decommissioning to edge effects that would be associated with the PCGP project is useful, even if based on assumptions[18]. Using an assumed edge reduction over time of 50 feet on each side of the road, decommissioning 5 miles of road would reduce existing road-related edge effects on an estimated 61 acres (5*5280*100/43560)

Linear edge provides another measurement of the edge effect. Approximately 5.0 miles of the proposed PCGP project would be located within LSR 223, creating 10 miles of new edge within LSR 223. Proposed road decommissioning would revegetate 5 miles of roads, removing approximately 10 miles of existing edge over time.

Stand-Density Management

Stand-density management is proposed in early and mid-seral Douglas-fir and ponderosa pine plantations that were planted. The purpose of this mitigation action is to restore stand density, species diversity, and structural diversity to those considered characteristic under a natural disturbance regime by enhancing and accelerating the physical and biological services for associated flora and fauna within LSR 223. Table 2.1.3.2-1 below displays the acres of density management activities occurring in LSR 223 and matrix.

TABLE 2.1.3.2-1

Stand-Density Management Activities in LSR 223 and Matrix

Treatment Type	LSR 223 Acres
Off-Site Pine Restoration	301
Commercial Thinning	247
Total	**548**

Source: USFS GIS, Hobson 2010

Managing stand density would increase growth rates, decrease susceptibility to stand-replacing fire, and diversify stand structure in otherwise relatively homogenous stands. This accelerated development would also reduce fragmentation and edge effects and would help maintain the ability of these stands to respond to changed environmental conditions from either natural or human-caused disturbances. The proposed thinning acres are within 1 mile and the off-site pine removal and restoration is within 2 miles of the pipeline right-of-way. Placing the off-site mitigation activities close to the actual pipeline corridor increases their effectiveness by affecting lands within, or near, the home ranges of individual species affected by the pipeline habitat changes. Because the mitigation actions address ecological processes like the edge effect, placing the mitigation action near the edge impacts would increase the effectiveness of the mitigation action by restoring ecosystem structures near the acres that would be affected by the pipeline.

Integrated Stand Density and Fuel Break Treatments (898 acres LSR 223)

Integrated stand density and fuel break treatments are intended to accomplish two outcomes. First, they are intended to enhance LSOG habitat by increasing the growth, health, and vigor of the trees remaining in the stands and restoring stand density, species diversity, and structural

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[18] This approach is consistent with CEQ Regulations for NEPA, 40 CFR 1508.22

diversity to those considered characteristic under a natural disturbance regime. Secondly, they are intended to reduce the probability of large-scale loss of LSOG from wildfires. Fuels treatments are decided on a case-by-case basis and rely on fuel loading information as well as proximity to roads and other factors. Slash treatments may be as simple as "lop and scatter" to get the fuels in contact with the ground for more rapid decomposition, or they may involve piling, burning, or removal of fuel from the site for biomass energy or other uses.

Stand-density management over time would reduce existing edge effects. There is no precise way to estimate the reduction in edge effects with available data since stands have many different age classes, perimeters, and canopy closures.

Snag Creation (190 acres LSR 223)

Snag creation is proposed as a mitigation action to replace snags lost in the pipeline right-of-way for habitat for cavity-nesting birds and denning sites for mammals (bats, bears, fishers, etc.). Snags would be lost from the pipeline corridor to facilitate pipeline construction and mitigate safety hazards for construction workers and from the removal of live trees that would have contributed to future snag habitat.

Approximately 3,040 snags within LSR 223 would be created by blasting tops from live trees (preferably trees with existing decay that makes them more suitable for cavity-nesting birds and/or as denning sites) or by inoculating living trees with heart rot decay fungi or other methods. Sites selected for snag creation would be within ½ mile of the pipeline right-of-way to develop snag habitat within (or near) the home ranges of cavity excavators being displaced by the pipeline corridor. Sites would be in mid- and late-seral stands.

The current direction is to manage CWD levels under a landscape perspective and to consider land allocation in determining where levels of CWD may occur overtime. DecAID (a tool for managing snags, partially dead trees, and downed wood for biodiversity in forests in Washington and Oregon) is a summary of the best available data on dead wood in Pacific Northwest ecosystems (Marcot et al. 2002). To use DecAID, planning areas should be large enough to encompass the range of variation in wildlife habitat types and structural conditions; it is suggested that planning areas be at least 20 square miles in size (12,800 acres). A reasonable objective is to manage for a range of conditions within the area, balancing areas with high densities of dead wood with moderate- and low-density areas (Marcot et al. 2002).

Wildlife and inventory data summarized in the DecAID Advisor can be applied to management and planning decisions at a range of spatial scales and geographic extents. The calculated tolerance levels (80, 50, and 30 percent) for wildlife data can be applied to stand-level management. However, it is not advised that a particular tolerance level be applied to all stands across a landscape. The LSRA for LSR 223 indicates that snags are below historic conditions (USDA and USDI 1999). The objectives of the LSR land allocation and the location and size of the project make it appropriate to manage for high and moderate snag densities for this project. Snags should be managed at the 80 percent tolerance level in LSRs. However, most of the proposed pipeline would be located along ridge tops that are prone to fire disturbance. Considering fuels, it would be appropriate to manage at a lower density of small snags and downed wood for both tolerance levels. The LSRA for this area recommended a desired future condition of at least 4 snags per acre >20 inches dbh and 15 feet tall (USDA and USDI 1999, table 8). The target within the LSR treatment areas would be to manage snags densities at 16 per acre >10.0 inches dbh, of which 8 per acre are >20 inches dbh.

Large Woody Debris Placement (164 acres LSR 223)

One of the components of CWD is LWD, which consists of trees or portions of trees lying on the forest floor. LWD placement is proposed to accelerate the development of LSOG forest characteristics by restoring this habitat component to areas where LWD is lacking.

Large wood would be placed in or near areas that are also receiving stand-density management treatment. The large wood would be from trees cut from the pipeline corridor. Sites selected for LWD placement are within 1/2 mile of the proposed pipeline right-of-way. As with the other off-site mitigation actions, placement of the mitigation activities close to the pipeline corridor can benefit species that would be affected by the vegetation changes within the corridor and would make these mitigation actions more effective. Sites for placement of LWD would be in early successional stands that are currently deficient in downed wood. The LWD placement is expected to vary to account for some of the range in variability found across the landscape. For 11- to 20-inch-diameter logs, densities would vary from 8 to 33 logs/acre. For 20-inch plus-diameter logs, densities would vary from 3 to 12 logs per acre. Logs would be approximately 40 feet in length, and the specified diameter (11 to 20 inches, and 20 inches plus) refers to the stem diameter at the midpoint of the 40-foot log.

Noxious Weed Treatment (6 miles)

Soils disturbed during pipeline construction and proposed mitigation activities would have the potential to disperse and generate potential seedbeds for noxious weeds. The proposed noxious weed treatment along 6 miles of roads within LSR 223 would assist in mitigating potential adverse habitat impacts.

Meadow Restoration (80 acres)

There would be a loss of forest habitat that buffers unique habitats and disruption to soil horizons within those habitats from the construction of the PCGP project. These actions would result in adverse impacts to native flora and fauna and increase the opportunities for invasion by non-native plant species. These impacts cannot be fully mitigated on site; therefore, restoration activities such burning, removal of encroaching conifers, and noxious weed control would be applied to 80 acres of meadow located in LSR 223.

Comparison of Total Adverse Direct and Indirect Effects of the PCGP Project on Edge Effect and Total Beneficial Direct and Indirect Effects of Mitigation Actions on Edge Effect in LSR 223

The acres of direct and indirect effects of the PCGP project and the acres of direct and indirect effects of various mitigation actions as related to the edge effect are shown in table 2.1.3.2-2 and figure 2.1-6. For the purposes of this comparison, PCGP direct effects are the clearing of vegetation in LSOG and non-LSOG forest, and the indirect effects of the corridor are modeled by the age class of vegetation and an associated estimate of edge effects. Since there is no precise method for predicting indirect effects, the following assumptions were used.

- Adverse indirect effects of the PCGP project on LSOG habitat are estimated to extend 100 meters from the cleared edge on each side of the corridor.
- Adverse indirect effects of the PCGP project for non-LSOG habitat are estimated to extend 30 meters from the cleared edge on each side of the corridor.
- No indirect effects are estimated for nonforested areas since there would be no new edge created.
- Direct effects of road decommissioning are estimated from the revegetation of an average road prism of 20 feet.
- The beneficial indirect effects of road decommissioning are estimated to extend 50 feet on each side of the decommissioned road in all vegetation classes.
- The beneficial indirect effect of stand density management treatments is estimated to extend 100 feet from the perimeter of the unit in all vegetation classes.

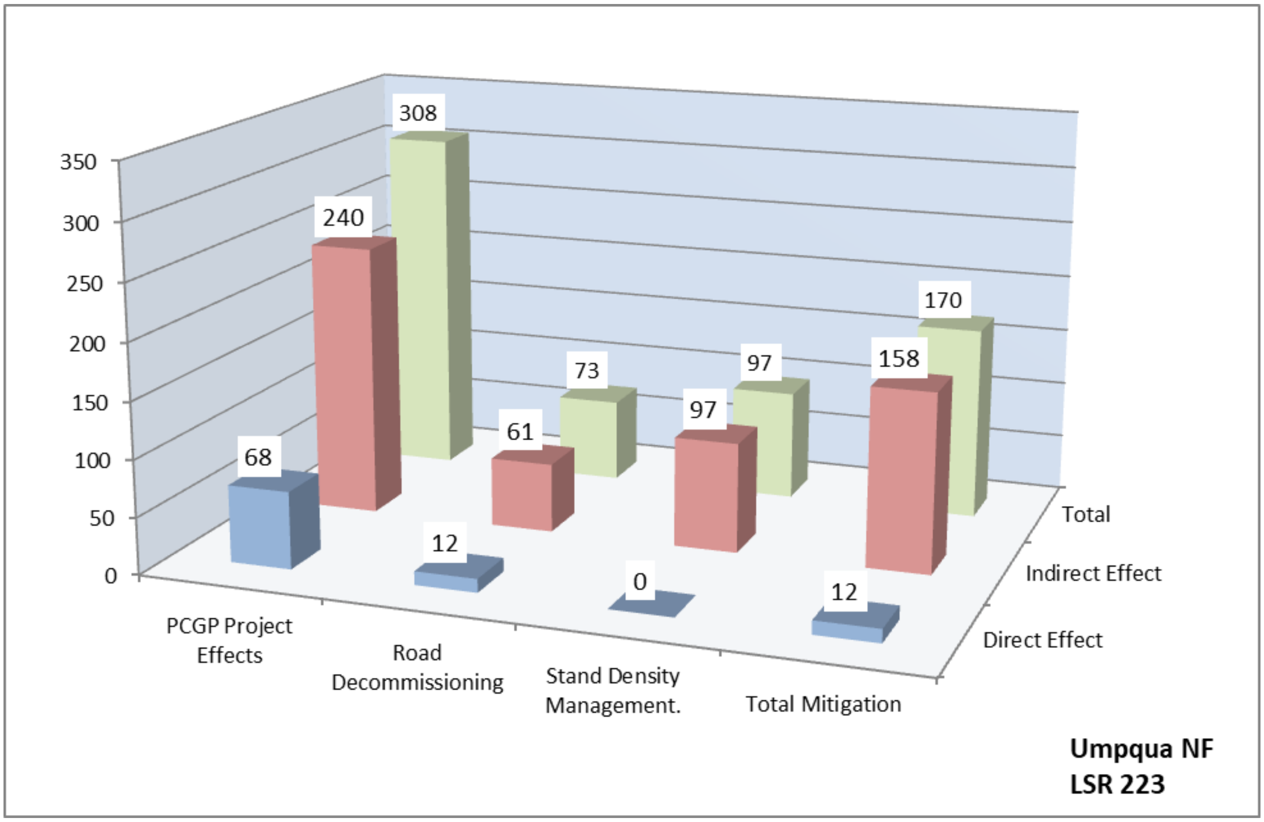
TABLE 2.1.3.2-2

Comparison of Total PCGP Project Impacts a/ on LSR 223 and Estimated Edge Reduction Effect b/ of Proposed Off-Site Mitigation Actions (Acres)

Umpqua NF (LSR 223)	Direct Effect	Indirect Effect	Total
	Total PCGP Project Impacts on LSR 223		
PCGP Effects	68	240	308
	Proposed Off-Site Mitigation		
Road Decommissioning	12	61	73
Stand-Density Management.	0	97	97
Total Mitigation	**12**	**158**	**170**

a/ PCGP project direct effects include corridor clearing and TEWAs. Indirect effects include 100 meters on each side of corridor edge in LSOG and 30 meters on each side of corridor edge in non-LSOG
b/ Direct edge reduction effects include acres of decommissioned road revegetated (5*5280*20/43560) and indirect effects include 50 feet on each side of decommissioned road and 100 feet along perimeter of stand-density treatments (8 miles).
Data source: BLM, USFS GIS data layers, Hobson 2010

Figure 2.1-6. Comparison of Total PCGP Project Impacts on LSR 223 and Estimated Edge Reduction Effect of Proposed Off-Site Mitigations (acres)



The comparisons displayed are not one-to-one correlations since the adverse impacts on the edge created by construction of the pipeline would occur immediately and the reduction of the edge effect from the off-site mitigation would occur over time. The comparison also does not take into consideration that the edge created by the construction of the pipeline would also be reduced over time as the majority of the corridor (about 70 percent) would be reforested. The comparison does display that some of the mitigation actions proposed would help reduce the amount of fragmentation in LSR 223 by reducing the amount of existing edge. Over time, this would allow for the formation of larger blocks of interior forest habitat.

2.1.4 Impact on the Functionality of LSR 223 on the Umpqua NF and Consistency with LSR Standards and Guidelines

The functionality of LSR 223 relates directly to the goals and objectives for LSRs (see section 1.2) and can be measured by the quantity, quality, and distribution of LSOG forest habitat in the LSR and how the proposed PCGP project would impact these characteristics.

- Quantity: The overall quantity of LSOG habitat within LSR 223 on the Umpqua NF would increase with the proposed LRMP amendment. The PCGP project would remove approximately 20 acres of LSOG habitat but the reallocation would add 296 acres of LSOG habitat, for a net increase of 276 acres.

- Quality: The area proposed for reallocation to LSR 223 contains some large blocks of LSOG habitat and it would also be located immediately adjacent to two KOACs, providing further consolidation of LSOG habitat and increased protection of NSO habitat. With the reallocation of matrix to LSR and the consolidating of larger blocks of LSOG habitat, the quality of the LSOG habitat within LSR 223 would be slightly improved. There is also the benefit of the 289 acres of younger (less than 80 years old) stands in the reallocated acres being managed for future LSOG habitat, which would provide the potential for larger blocks of LSOG habitat.

- Distribution: The distribution of LSOG habitat within LSR 223 would remain largely unchanged with the proposed PCGP project and the reallocation of matrix to LSR LRMP amendment. To the extent there are minor changes, they would be beneficial due to the location of the proposed reallocation. The reallocation would occur on the southwest edge of the LSR, providing for some additional connectivity with the nearest LSRs to the south and west.

- The off-site mitigation actions would improve the quantity, quality, and distribution of LSOG habitat in LSR 223 by accelerating the development of constituent elements of late-successional habitat, reducing the risk of stand-replacement fire and reducing fragmentation through road decommissioning and stand-density management.

The project design features, the reallocations of matrix to LSR, and the off-site mitigation actions for LSR 223 in the Umpqua NF have been designed with the goal of making the overall impact of the PCGP project either neutral or beneficial to the creation and maintenance of late-successional habitat. These actions combined would maintain or improve the functionality of LSR 223.

2.2 ROGUE RIVER NF LSR 227

The Rogue River NF LRMP, as amended, serves as the single land management plan for the Rogue River NF (USDA Forest Service, Rogue River NF LRMP 1990). Amendments to the Rogue River NF LRMP include the NWFP and the inclusion of LSRs (see section 1.2.3 above). The Rogue River NF LRMP is available at http://www.fs.usda.gov/detail/rogue-siskiyou/landmanagement/?cid=stelprdb5315100. The proposed PCGP project would cross approximately 13.9 miles of the Rogue River NF and, if constructed, would directly affect (corridor plus TEWAs and UCSAs) approximately 281 acres of LSR 227. The proposed project and LSR 227 in the Rogue River NF are displayed on figure 2.2-1.[19]

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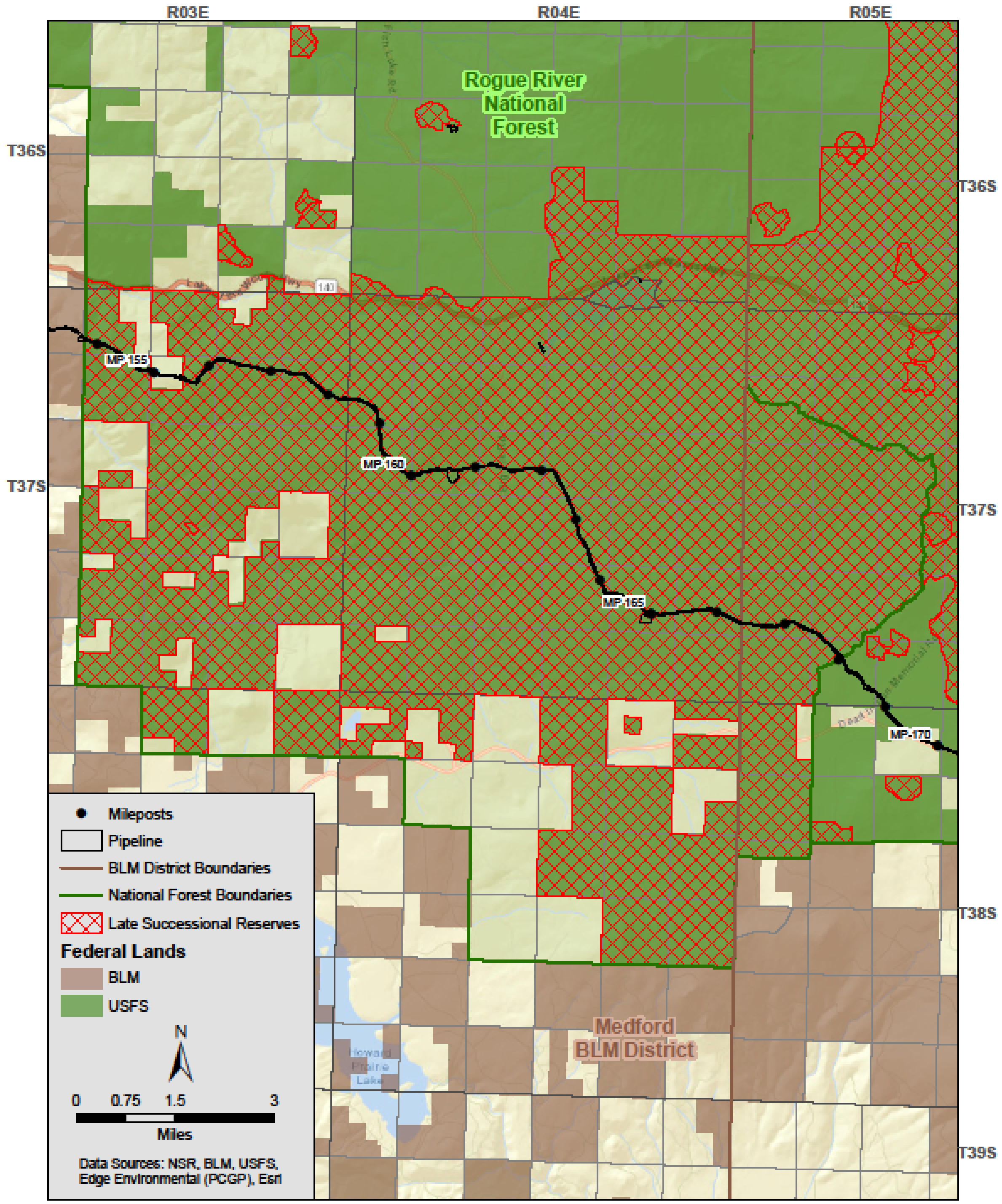
[19] The miles and acreage are slightly different from the DEIS due to the pipeline reroute for the Pacific Crest Trail crossing (see section 3.4.2.9 of the Final EIS for a description of the reroute). Although there are three more acres of direct impact the new route would directly impact three less acres of LSOG habitat.

Figure 2.2-1. Map of Proposed PCGP Project and LSR in the Rogue River NF



2.2.1 Mapped LSR 227 in the Rogue River NF

2.2.1.1 Summary from LSRA

The South Cascades LSRA (USDA and USDI 1998a) area is located in a network of southwest Oregon LSRs. The LSRA originally included lands administered by the Rogue River, Winema, Umpqua, and Willamette NFs and the Butte Falls, Mt. Scott, and South Valley Resource Areas of the Medford, Roseburg, and Eugene Districts of the BLM. The assessment area included about 721,000 acres in the following LSRs: 222, 224, 225, 226, and 227. The BLM lands are no longer included in this NWFP LSR as a result of the 2016 Resource Management Plans for western Oregon. The BLM lands, however, are included in new land allocations that are dedicated to maintaining and developing habitat for the NSO and MAMU (USDI 2016). The information and recommendations contained in the LSRA are still relevant in addressing LSR function, proposed LRMP amendments, and compensatory mitigation actions on the Rogue River NF.

The South Cascades LSRs are part of a regional network designed in association with other land allocations (riparian reserves, National Parks, Wildernesses, botanical areas, etc.) to provide functional late-seral habitat, including long-term dispersal and migratory pathways. From a regional perspective, the south Cascades provide a link and are a north-south transition area between the Sierra Nevada of northern California and the northern Cascade Range of Oregon and Washington. The Siskiyou Mountains run generally east-west and provide connectivity between the coastal and inland south Cascade areas. The Columbia and Klamath rivers, the only major rivers that significantly breach the Cascade and Coast ranges, allow mixing of inland and coastal species and genetic varieties. These links allow movement of species and genetic material north and south and east and west in response to changes in climate such as occurred during the ice ages and the xerothermic period. These links are still important in the evolutionary process and health of the Pacific Northwest flora and fauna.

The habitat within the South Cascades LSRs serves as source areas for spotted owls and other late-successional and old growth–dependent species. Since species depend on habitat, a variety of habitats present over time and space provides for a broad range of species, including rare and sensitive species and those associated with late-seral stages. Successional and disturbance processes have provided a varied seral-stage mix and a functional landscape pattern. However, the effects of fire, the most influential process, have been altered and will likely continue to be modified well into the future.

The eastern portion of LSR 227 contains many acres of relatively recent volcanic flows in which the soils are not developed well enough to support late-seral forests. The amount of interior late-seral habitat also decreases as one moves south and east through the LSR network (i.e., fragmentation is greater). Previous work on the Regional Ecological Assessment Program (REAP) suggests that the historical functional range is between 45 and 75 percent late-seral conditions.

2.2.1.2 Changes Since LSRA Was Written

Two wildfires totaling approximately 294 acres—the Little Butte and the Fish Lake fires—have occurred in LSR 227 in the Rogue River NF since the LSRA was written in 1998. Existing roads total approximately 238 miles, with 70 miles of road being decommissioned. Vegetation management has included approximately 540 acres of precommercial thinning, 27 acres of meadow restoration, aspen restoration, invasive plant treatments, and a 207-acre commercial thinning timber sale (Big Bad Elk).[20]

2.2.2 Proposed LRMP Amendments and Mitigation Actions Relevant to LSR 227

2.2.2.1 LRMP Amendment

The Forest Service proposes to amend the Rogue River NF LRMP as follows:

RRNF-7, Reallocation of Matrix Lands to Late Successional Reserves[21]

The Rogue River NF LRMP would be amended to change the designation of approximately 522 acres from the matrix land allocation to the LSR land allocation in Section 32, T.36 S., R. 4 E., W. M., Oregon.

This change in land allocation is proposed to partially mitigate for the potential adverse impact of the PCGP project on LSR 227 in the Rogue River NF. The amendment would change future management direction for the lands reallocated from matrix to LSR. A map of the proposed reallocation is displayed in figure 2.2-2.

2.2.2.2 Mitigation Actions

The lands in the Rogue River NF that would be affected by the proposed project are all within LSR 227. The primary objectives for the off-site mitigation actions are to accelerate the development of LSOG forest habitat in LSR 227 through snag creation, woody debris placement, and density management, and to reduce LSOG forest habitat fragmentation through road decommissioning.

The primary mitigation action for the effects of the proposed pipeline on LSR 227 would be to replace the acres in LSR 227 that would be affected by the pipeline with additional acres of LSOG forest habitat that are currently outside the LSR. The additional off-site mitigation actions proposed are consistent with the recommendations in the LSRA for LSR 227. These off-site mitigation actions would accelerate the development of LSOG forest habitat elements to further offset the effects of the PCGP project on LSR 227 in the long term. The additional off-site mitigation actions would also increase the effectiveness of the LSOG forest habitat in LSR 227 by improving the quantity, quality, and distribution of high-quality habitat. Figure 2.2-3 displays where the proposed off-site mitigation actions would occur.

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[20] Personal communications with Wes Yamamoto, former Forest Service PCGP project coordinator, and Jeff Von Kienast

[21] Evaluations of this proposed amendment and how it relates to planning requirements in the Forest Service planning rule at 36 CFR 219 (2012 Version) is discussed in Section 4.7.3.4 of the Final EIS and in Appendix F.2.

Figure 2.2-2. Map of Proposed Matrix Reallocated to LSR in the Rogue River NF

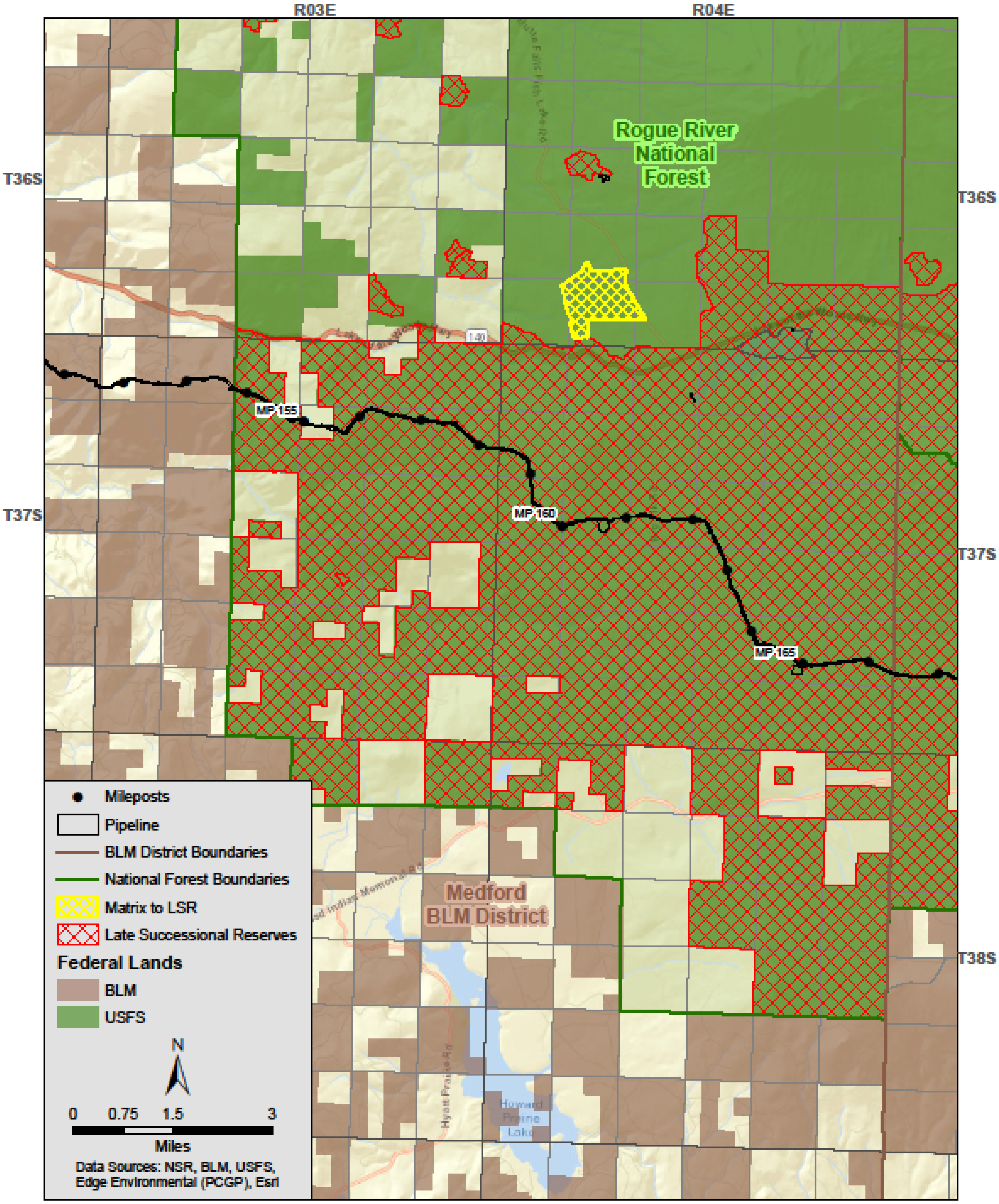
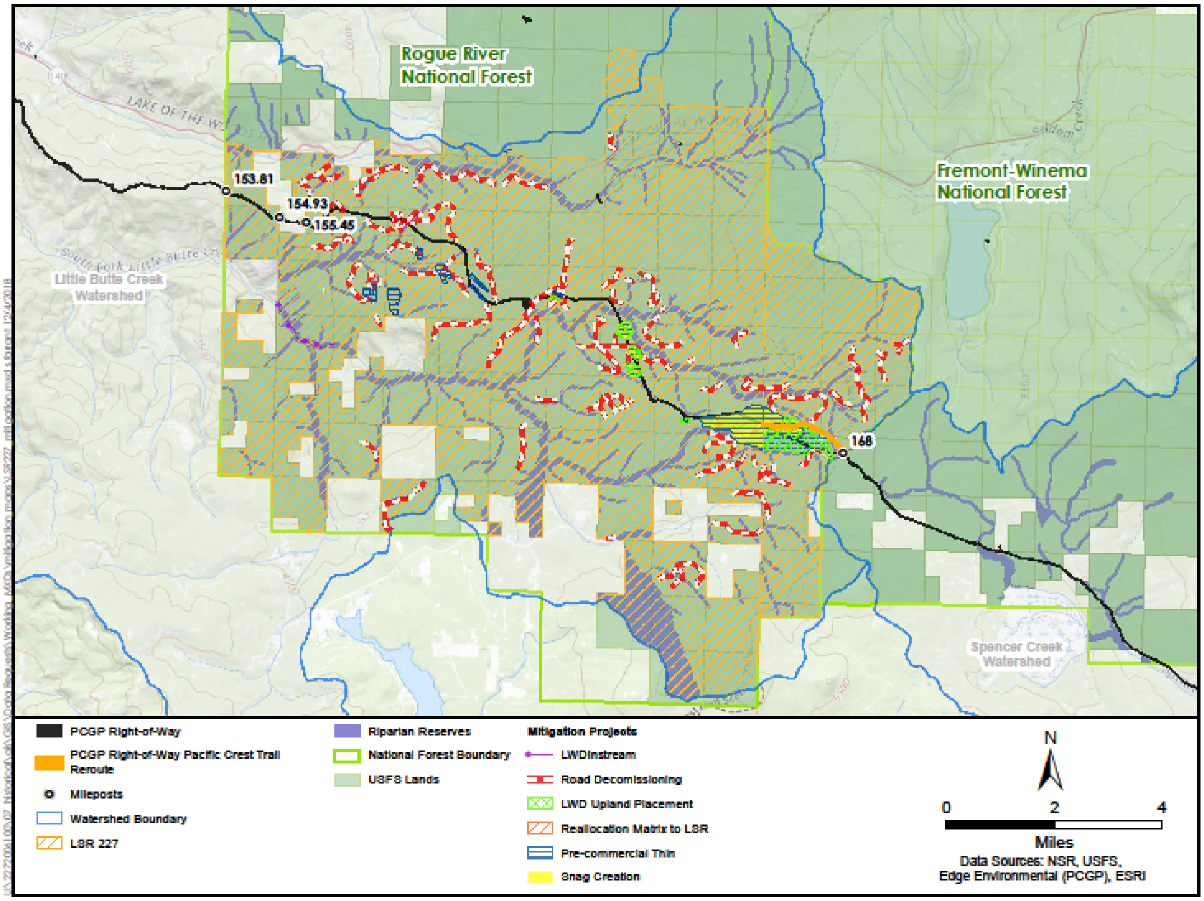


Figure 2.2-3. Proposed Off-Site Mitigation Actions in the Rogue River NF



2.2.3 Impacts Related to the Proposed Amendments and Mitigation Actions Relevant to LSR 227

2.2.3.1 LRMP Amendment

RRNF 7, Reallocation of Matrix Lands to LSR 227

In the Rogue River NF, the proposed project would lie entirely within LSR 227. If constructed, the portion of the project on the Rogue River NF would be about 13.7 miles long and would clear approximately 210 acres of forest vegetation in LSR 227, of which approximately 52 acres are LSOG forest.[22] The matrix area proposed for reallocation to LSR is approximately 522 acres, of which approximately 237 acres are LSOG forest (see figure 2.3-9). This change in land allocation is proposed to partially mitigate for the potential adverse impact of the PCGP project on LSR 227 in the Rogue River NF. When acres reallocated from matrix to LSR are compared to the acres of LSR that would be cleared by the PCGP project, the proposed amendment would reallocate about 2-1/2 times more acres to LSR than would be cleared in the project corridor. When comparing acres of LSOG habitat, the proposed amendment would reallocate over 4 times

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[22] This is a reduction of three acres from the DEIS as a result of the pipeline reroute of the Pacific Crest Trail crossing (see section 3.4.2.9 of the Final EIS).

more acres of LSOG habitat than would be cleared by the project (see table 2.2.3.1-1 and figure 2.2.4 below).

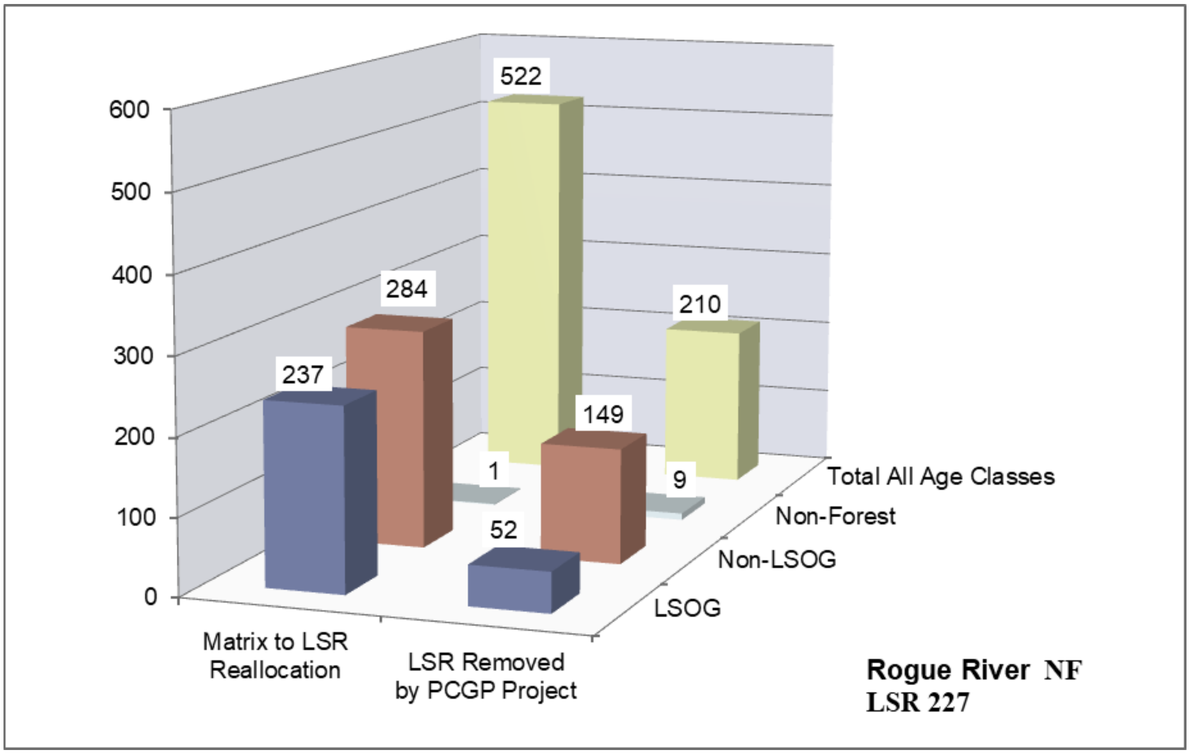
TABLE 2.2.3.1-1

Comparison of LSR Acres Cleared a/ by PCGP Project and Acres of Matrix Reallocated to LSR

Rogue River NF LSR 227	LSOG	Non-LSOG	Non-Forest	Total All Age Classes
Matrix to LSR Reallocation	237	284	1	**522**
LSR Cleared by PCGP Project	52	149	9	**210**

a/ Acres cleared include corridor clearing and TEWAs.
Data source: BLM, USFS GIS data layers, Cox 2010

Figure 2.2-4. Comparison of LSR Acres Cleared by the PCGP Project and Acres of Matrix Reallocated to LSR



In addition to the impacts from the removal of forest vegetation in LSR 227, there would be additional impacts from the acres modified by UCSAs and the acres indirectly affected through the creation of new edges and fragmentation of older forest. A comparison of the total acres affected in LSR 227 and the acres that would be reallocated are displayed in table 2.2.3.1-2 and figure 2.2-5 below.[23]

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[23] Changes in these acres from the DEIS is a result of the pipeline reroute of the Pacific Crest Trail crossing (see section 3.4.2.9 of the Final EIS).

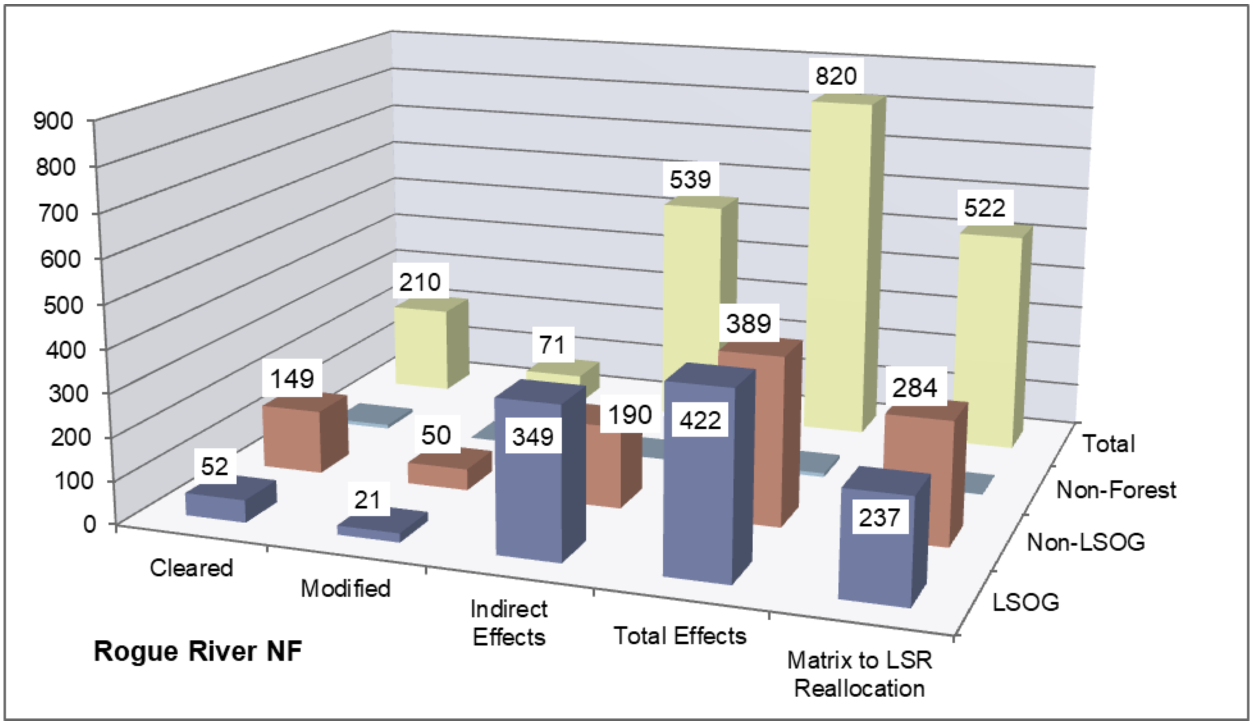
TABLE 2.2.3.1-2

Comparison of Total LSR Acres Affected a/ by PCGP Project and Acres of Matrix Reallocated to LSR

Rogue River NF LSR 227	Cleared	Modified	Indirect Effects	Total Effects	Matrix to LSR Reallocation
	Direct Effects				
LSOG	52	21	349	422	237
Non-LSOG	149	50	190	389	284
Non-Forest	9	0	0	9	1
Total	**210**	**71**	**539**	**820**	**522**

a/ PCGP total effects include cleared acres (corridor and TEWAs), modified acres (UCSAs), and indirect effect acres (100 meters on each side of the cleared corridor edge in LSOG and 30 meters on each side of the cleared corridor edge in non-LSOG).
Data source: BLM, USFS GIS Data Layers, Cox 2010

Figure 2.2-5. Comparison of Total LSR Acres Affected by PCGP Project and Acres of Matrix Reallocated to LSR



In addition to the impacts of the PCGP corridor, there are also potential impacts to LSR 227 from road improvements that may be necessary to accommodate the trucks that would construct the pipeline. These trucks are longer than typical trucks that use forest roads, and some road widening and curve realignment may be necessary to safely allow for this truck traffic. It is estimated that only one acre of road improvements would occur within LSR 227. Although the improvements would occur to the extent possible within the existing clearing limits, it is possible that some additional clearing of forest vegetation would be necessary to accommodate the road improvements (see the Transportation Management Plan of Development in Appendix F.10 for additional details.

2.2.3.2 Mitigation Actions

Road Decommissioning (57 miles)

Although the proposed PCGP project has been routed to avoid LSOG forest as much as possible, it would create edge effects that may affect interior stand microclimates and cause habitat fragmentation within LSR 227 that cannot be avoided. Edge is the effect of an opening on microclimate in adjacent stands (Chen, Franklin et al. 1993). Edge effects introduced by roads are highly variable and depend on aspect, road width, vegetation crossed, and other variables. Edge effects are greatest when there is a high contrast in structure and composition between a newly created opening and the adjacent landscape (Harper, Macdonald et al. 2005, p. 768). Thus, edge effects are greatest when they affect interior stand habitats of older trees and least when the new opening is similar to the surrounding landscape, such as when it is adjacent to an existing road or in a recent clearcut.

Decommissioning roads with appropriate restoration measures would presumably reverse edge effects and habitat fragmentation caused by existing roads and create habitat for a variety of animals (Switalski, Bissonette et al. 2004). By discouraging vehicular access, road decommissioning also eliminates disturbance (noise, presence, etc.) caused by human intrusion. This potentially benefits nesting behavior, in particular for the NSO. The effect of edge reduction by road decommissioning is highly variable for the same reasons described for the edge effects created by constructing a road. Agency field experience has shown that road decommissioning reduces edge effects over time by revegetating road surfaces and eliminating road corridors. Revegetating selected roads in conjunction with the density management proposed for adjacent plantations would block up forested habitat and reduce edge effects and fragmentation in a period of about 40 years as planted trees became pole sized (5 to 9 inches dbh and 20 to 40 feet tall). Published data on the rate and pattern of edge reduction associated with decommissioning roads are not available (Baker 2011), but a comparison of the predicted beneficial effect of road decommissioning on edge effects associated with the PCGP project is useful, even if it is based on assumptions.[24] Using an assumed edge reduction over time of 50 feet on each side of the road, decommissioning roads would reduce existing road-related edge effects on an estimated 691 acres (57*5280*100/43560).

Linear edge provides another measurement of edge effect. Approximately 13.7 miles of the proposed PCGP project would be located within LSR 227, creating 27.4 miles of new edge within LSR 227. Proposed road decommissioning would revegetate 57 miles of roads, removing approximately 113 miles of existing edge over time. Fragmentation in the context of impacts on the LSR land allocation is the process of reducing the size and connectivity of stands that compose a forest. The conversion of large tracts of old-growth forest to small, isolated forest patches with large edge areas can create changes in microclimate, vegetation species, and predator-prey dynamics.

To provide an indication of the effects of the proposed PCPG corridor and proposed road decommissioning on fragmentation, the Forest Service conducted a stand-level analysis, considering stands that fall within 100 meters of the proposed pipeline corridor (USDA Forest Service, Rogue River NF 2010). All stands that overlapped the 100-meter buffer were included

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[24] This approach is consistent with CEQ Regulations for NEPA, 40 CFR 1508.22.

in the analysis out to the stand edges beyond the buffer. The only changes examined in this analysis were natural growth and development of trees and the off-site mitigation activities. Natural events, such as wildfire and storms, were not modeled because of their stochastic nature and the relatively limited size of the analysis area. Within the modeled stands, it was assumed that there would be no forest management harvest activities during the 60 years modeled beyond activities already planned. Future management activities would need to be consistent with the LRMP in effect at the time the project is implemented.

Construction of the pipeline would result in the fragmentation of LSOG forest in LSR 227 and would increase the fragmentation index (ratio of edge to acres) in modeled stands (those within 100 meters of the pipeline) by about 1 percent.[25] After 60 years, normal stand growth would reduce this ratio by about 3 percent. With implementation of proposed road decommissioning, the ratio of edge acres would decrease by about 34 percent. A decrease in the ratio of edge to opening means that patch sizes of forested areas have increased. LSR 227 currently has 1,445 patches of mature forest greater than 1 acre in size that lie within 100 meters of the edge of the proposed PCGP project corridor. Project construction would increase fragmentation by passing through and dividing some of these patches, with a net increase of five patches. The current average patch size throughout the LSR is about 7 acres, which is not projected to change within the next 60 years. With the proposed road decommissioning and road closures, the size of patches within 100 meters of the proposed pipeline would increase to an average of 14.5 acres within 60 years. This would be consistent with a reduction in the edge to opening ratio discussed above.

In terms of interior patches (LSOG areas that are at least 1 acre in size and at least 300 feet from a hard edge), there are currently 779 interior patches in LSR 227. Eight of these (about 1 percent of the interior patches) would be fragmented by the pipeline corridor. In 60 years, interior patches are projected to increase to 856 interior patches, a 9 percent increase from the current condition. With the proposed road decommissioning, the number of interior patches would increase by about 16 percent to 927, and the average size of the patches would increase from about 6.5 acres to 13.9 acres, an increase in size of over 100 percent.

There are approximately 233 miles of road in LSR 227. The proposed road decommissioning would create a 23 percent reduction in road mileage in this LSR. Current road density in LSR 227 is about 3.3 miles per square mile. With the proposed road decommissioning, it would be reduced to about 2.5 miles per square mile. Reductions in road density that would occur within ¼, ½, and 1 mile of the pipeline corridor are shown in table 2.2.3.2-1.

TABLE 2.2.3.2-1

Reductions in Road Density within 1/4, 1/2, and 1 mile of PCGP Corridor

Road Density	**Existing Road Density (miles/square mile)**	**With Road Decommissioning (miles/square mile)**
LSR 227	3.3	2.5
Within 1/4 mile of pipeline	3.9	1.7
Within 1/2 mile of pipeline	4.1	1.7
Within 1 mile of pipeline	4.2	2.5

---

[25] Changes in edge:area ratios are more meaningful as relative numbers rather than absolute values so percentages are used to express changes in values.

Stand-Density Management (618 Acres)

Precommercial thinning is proposed for overstocked plantations to accelerate the development of late-successional and old-growth forest characteristics in LSR 227. Managing stand density would increase growth rates, decrease susceptibility to stand-replacing fire, and diversify stand structure in otherwise relatively homogenous stands. This accelerated development would also reduce fragmentation and edge effects and would help maintain the ability of these stands to respond to changed environmental conditions from either natural or human-caused disturbances. All 618 acres are within 0.5 mile of the pipeline right-of-way. Placing the off-site mitigation activities close to the actual pipeline corridor would increase their effectiveness by affecting lands within, or near, the home ranges of individual animals and species affected by the pipeline habitat changes. As the mitigation actions address ecological processes like edge effects, placing the mitigation within or near the edge impacts increases the effectiveness of the mitigation by restoring ecosystem structures and processes on some of the acres also affected by the pipeline. Thinning young stands would, over time, reduce existing edge effects. There is no precise way to estimate the edge effect reduction with available data since stands have many different age classes, perimeters, and canopy closures. The estimated perimeter of the units proposed for thinning is approximately 6 miles. Assuming some edge reduction within 100 feet of the edge of these units, density management would reduce edge effects over time by an estimated 73 acres (6*5280*100/43560).

Fuels treatments for the slash generated by stand-density management are decided on a case-by-case basis and rely on slash loading information as well as proximity to roads and other factors. Slash treatments may be as simple as “lop and scatter” (cutting slash into smaller pieces and scattering) to get the fuels in contact with the ground for more rapid decomposition, or they may involve piling and burning, jackpot or underburning, or removal of slash from the site for biomass energy or other uses.

Snag Creation (622 acres)

Snag creation is proposed as a mitigation action to replace snags lost in the pipeline right-of-way for habitat for cavity-nesting birds and denning sites for mammals (bats, bears, fishers, etc.). Snags would be lost from the pipeline corridor to facilitate pipeline construction or to mitigate safety hazards for construction workers.

Approximately 1,244 snags would be created by blasting tops from live trees (preferably trees with existing decay, which makes them more suitable for cavity-nesting birds and/or as denning sites), by inoculating living trees with heart rot decay fungi, or by other methods. Sites selected for snag creation would be within ½ mile of the pipeline right-of-way to develop snag habitat within (or near) the home ranges of cavity excavators that are displaced by the pipeline corridor. Sites would be in mid-successional stands or around the edges of early successional stands that are currently deficient in snags, as defined by the LRSA (USDA and USDI 1998a). Stand data for the plant associations in this area (which is an indication of undisturbed forest snag levels) show these stands have an average of about four snags per acre in the 11- to 20-inch-diameter range and an additional four snags per acre greater than 20 inches in diameter.

If the tree diameters in the stands prevent snag creation in the >20-inch-diameter size class, additional snags in the smaller size class (11- to 20-inch-diameter) would be created to make up for the deficit. For sites bordering early successional stands, snags would be created within 100 yards of the stand boundary at the same trees per acre levels described above.

Large Woody Debris (LWD) Placement in Plantations (511 acres)

Large wood placement in plantations is proposed to accelerate the development of LSOG forest characteristics by restoring this habitat component to plantations where LWD is lacking. Any wood used in this mitigation would come from the PCGP project corridor. No additional trees outside the corridor would be harvested to provide LWD so this mitigation is necessarily limited by the amount of LWD that can be provided from the corridor. LWD used in this mitigation would be staged at appropriate locations and placed with a helicopter.

The first priority in restoration with respect to LWD would be to ensure that that the PCGP project itself meets LRMP standards after construction is completed. After LWD standards within the corridor have been met, any additional LWD would be available for placement in the adjacent units identified below.

Large wood would be placed in plantations that are also receiving stand-density management treatment. The large wood would be from trees cut from the pipeline corridor. Sites selected for downed woody material placement would be within ½ mile of the pipeline right-of-way. As with the other off-site mitigation actions, placement of the mitigation activities close to the pipeline corridor can benefit species that are affected by the vegetation changes within the corridor and would make these mitigation actions more effective. Sites would be in early successional stands that are currently deficient in downed wood.

The large wood placement piece count per acre is expected to vary to account for some of the range in variability found across the landscape. For 11- to 20-inch-diameter logs, treatments would average about 10 pieces on each treated acre but densities would vary from 8 to 33 logs per acre. For 20-inch plus-diameter logs, an average of 5 pieces would be placed on each treated acre but densities would vary from 3 to 12 logs per acre. Logs would be approximately 40 feet in length, and the specified diameter (11- to 20-inch and 20-inch plus) refers to the stem diameter at the midpoint of a 40-foot log.

Comparison of Total Direct and Indirect Effects of the PCGP Project and the Beneficial Effects of Off-Site Mitigation Actions on Edge

Acres of direct and indirect effects of the PCGP project and the acres of direct and indirect effects of various mitigation actions as related to a reduction in edge effects are shown in table 2.2.3-4. For the purposes of this comparison, PCGP direct effects are the clearing of vegetation in LSOG and non-LSOG forest, and indirect effects of the PCGP project are modeled by the age class of vegetation and an associated estimate of edge effects. Since there is no precise method for predicting indirect effects, the following assumptions were used.

- Indirect effects for LSOG habitat are estimated to extend 100 meters from the cleared edge on each side of the corridor.
- Indirect effects for non-LSOG habitat are estimated to extend 30 meters from the cleared edge on each side of the corridor.
- No indirect effects are estimated for nonforested areas since there would be no new edge created.

- Direct effects of road decommissioning are estimated from the revegetation of an average road prism of 20 feet.
- Indirect effects of road decommissioning are estimated to extend 50 feet on each side of the decommissioned road in all vegetation classes.
- The indirect effect of stand-density management is estimated to extend 100 feet from the perimeter of the unit in all vegetation classes.
- Indirect effects of other mitigation actions are not considered to reduce edge in this comparison.

Using these assumptions, combined direct and indirect effects of the project and proposed mitigation actions are shown in table 2.2.3.2-2 and figure 2.2-6 below.

TABLE 2.2.3.2-2

Comparison of Total PCGP Project Impacts a/ on LSR 227 and Estimated Edge Reduction Effect b/ of Proposed Off-Site Mitigation Actions (acres)

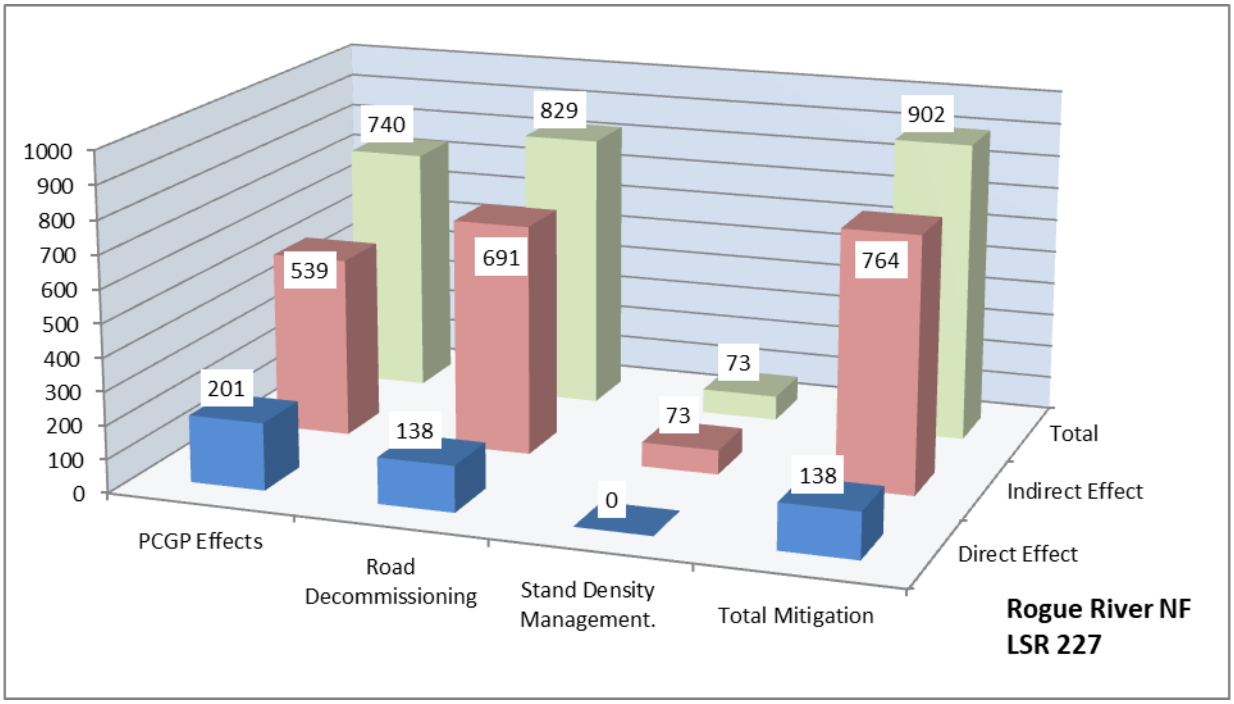
Rogue River NF (LSR 227)	**Direct Effect**	**Indirect Effect**	**Total**
	Total PCGP Project Impacts on LSR 227		
PCGP Effects	201	539	740
	Proposed Off-Site Mitigation		
Road Decommissioning	138	691	829
Stand-Density Management.	0	73	73
Total Mitigation	138	764	902

a/ PCGP project direct effects include corridor clearing and TEWAs in LSOG and non-LSOG forest. Indirect effects include 100 meters on each side of corridor edge in LSOG and 30 meters on each side of corridor edge in non-LSOG

b/ Direct edge reduction effects include acres of decommissioned road revegetated (53.2*5280*20/43560) and indirect effects include 50 feet on each side of decommissioned roads and 100 feet along the perimeter of stand-density treatments.

Data source: BLM, USFS GIS data layers, Hobson 2010

Figure 2.2-6. **Comparison of Total PCGP Project Impacts on LSR 227 and Estimated Edge Reduction Effect of Proposed Off-Site Mitigation Actions (acres)**



The comparisons displayed are not one-to-one correlations, since the adverse impacts on edge would occur immediately with the construction of the pipeline and the reduction of edge effect from the off-site mitigation would occur over time. The comparison also does not take into consideration that the edge created by the construction of the pipeline would also reduce over time as the majority of the corridor (about 70 percent) would be reforested. The comparison does display that some of the mitigation actions proposed would help reduce the amount of fragmentation in LSR 227 by reducing the amount of existing edge. Over time, this would allow for the formation of larger blocks of interior forest habitat.

2.2.4 Impact on the Functionality of LSR 227 on the Rogue River NF and Consistency with LSR Standards and Guidelines

The functionality of LSR 227 relates directly to the goals and objectives for LSRs (see section 1.2) and can be measured by the quantity, quality, and distribution of LSOG forest habitat in the LSR and how the proposed PCGP project would impact these characteristics.

- Quantity: The overall quantity of LSOG habitat within LSR 227 on the Rogue River NF would increase with the proposed LRMP amendment. The PCGP project would remove approximately 52 acres of LSOG habitat but the reallocation would add 237 acres of LSOG habitat for a net increase of 185 acres.

- Quality: The area proposed for reallocation to LSR 227 contains some large blocks of LSOG habitat. With the reallocation of matrix to LSR and the consolidating of larger blocks of LSOG habitat, the quality of the LSOG habitat within LSR 227 would be slightly improved. There is also the benefit of the 284 acres of younger (less than 80 years old) stands in the reallocated acres being managed for future LSOG habitat that would provide the potential for larger blocks of LSOG habitat.

- Distribution: The distribution of LSOG habitat within LSR 227 would remain largely unchanged with the proposed PCGP project and the reallocation of matrix to LSR LRMP amendment. To the extent there are minor changes, they would be beneficial due to the location of the proposed reallocation. The reallocation would occur on the north end of the LSR, providing for some additional connectivity with the nearest LSRs to the north.
- The off-site mitigation would improve the quantity, quality and distribution of LSOG habitat in LSR 227 by accelerating the development of constituent elements of late-successional habitat, reducing the risk of stand-replacing fire, and reducing fragmentation through road decommissioning and stand-density management.

The project design features, the reallocation of matrix to LSR, and the off-site mitigation actions for LSR 227 in the Rogue River NF have been designed with the goal that the overall impact of the PCGP project would be either neutral or beneficial to the creation and maintenance of late-successional habitat. These actions combined would maintain or improve the functionality of LSR 227.

3.0 LIST OF REPORT PREPARERS AND CONTRIBUTORS

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Sylvia Langford	Stantec	Desktop Publisher	39 years	Document Formatting

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Jordan Cove Natural Gas Liquefaction and Pacific Connector Gas Pipeline Project

Final EIS

Attachment 1 to Appendix F3

Late Successional Reserves Crossed by PCGP Project
Revised Stouts Creek Fire Report

Pacific Connector Gas Pipeline
Umpqua National Forest

Prepared for:

USDA Forest Service

Prepared by:

Stantec

January 2019

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TABLES

FIGURES

1.0 INTRODUCTION

The proposed Pacific Connector Gas Pipeline (PCGP) would cross National Forest (NF) system lands in portions of Late Successional Reserve (LSR).[1] The Standards and Guidelines in the Northwest Forest Plan (NWFP) guide management activities in LSR. This revised report is specific to mapped LSR 223 on the Umpqua NF that was impacted by the Stouts Creek Fire (the fire) in August 2015.[2] The fire continued to burn as the 2015 Final Environmental Impact (FEIS) for the PCGP project was being sent to the printer by the Federal Energy Regulatory Commission (FERC). The September 2015 FERC FEIS acknowledged the fire was a landscape-level change that was not specifically addressed at the time the 2015 FEIS was prepared.

The fire started on July 30th 2015 in Douglas County Oregon, near the small town of Milo. The fire continued to burn throughout August and into September. The proposed PCGP project lies within the fire perimeter approximately between mile post (MP) 95.5 and MP 108.9 (see figure 1.0-1). The discussion in this report will focus on the changed conditions in LSR 223 as a result of the fire with an emphasis on how the fire and suppression activities affected the late-successional and old growth (LSOG) forests and non-LSOG forests within the proposed pipeline corridor. This supplement will also address the effect of the fire on the proposed off-site mitigation actions related to LSR 223.

Impacts of the fire on LSR vegetation were determined by utilizing BARC (Burned Area Reflectance Classification) data. This satellite-derived layer of post-fire vegetation condition classifies data into four categories of fire severity including low/unburned, low, moderate, and high. These data were then used as an input for burn severity mapping produced by Burned Area Emergency Response (BAER) teams (Silva 2015). Using GIS, the acreages of fire severity were calculated to obtain acreage estimates for the amount of LSOG and non-LSOG habitat burned within LSR 223 (see table 1.0-1).

Table 1.0-1

Acres of LSR 223 Impacted by the Stouts Creek Fire

	Vegetation Type		
Fire Severity	**LSOG**	**Non-LSOG**	**Total LSR Acres**
Unburned/Low	3,298	3,813	7,111
Moderate/High	1,190	1,766	2,956
Total Acres	**4,488**	**5,579**	**10,067a**

a) This figure does not include the approximate 19 acres of non-forest land that burned within this portion of LSR 223

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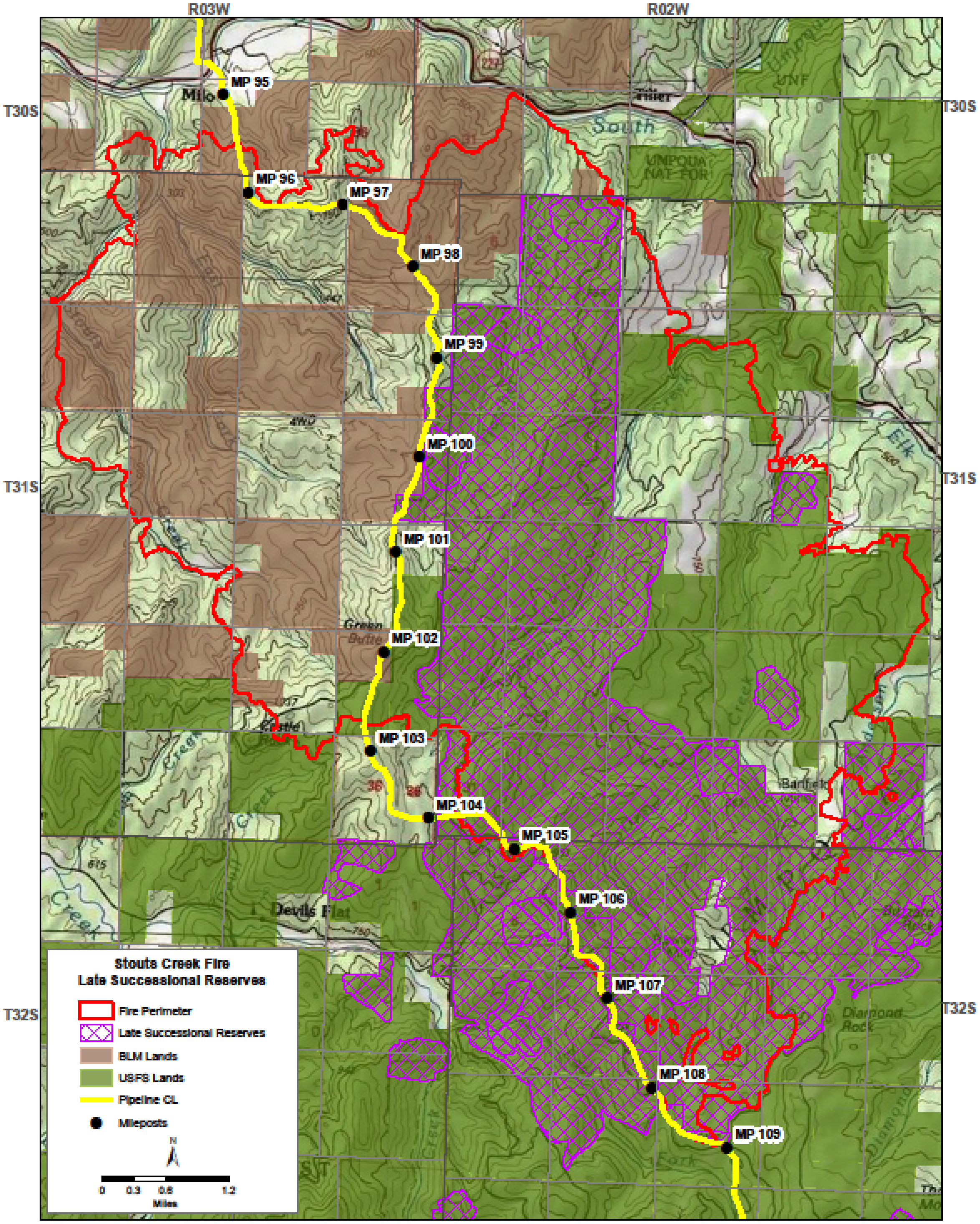
[1] In 2015 BLM lands were also included in LSRs under the NWFP. However since that time the BLM issued new Resource Management Plans for western Oregon in August 2016 and the BLM lands crossed by the PCGP Project are no longer under the direction of the NWFP.

[2] This report revises an earlier draft version that was prepared in 2016 by North State Resources (now Stantec). That draft report addressed both BLM and Forest Service lands. The report has been revised since BLM lands are no longer included in the NWFP.

Figure 1.0-1. Map of LSR in Relation to the Stouts Creek Fire.



For this analysis, the LSOG and non-LSOG layers were overlaid with the BARC data to estimate habitat losses in terms of canopy cover modification. Field surveys[3], discussions with Forest Service natural resource specialists, and BAER Reports, confirmed that the moderate and high severity classification represented a stand replacement fire event. Areas classified as low severity generally did not burn the canopy (see figures 1.0-2 thru 1.0-4).

The amount of moderate to high fire intensity that occurred within LSOG habitat within LSR 223 was approximately 1,190 acres. Although these acres of burned LSOG represented stand replacement fire it was determined that the acres would continue to function as foraging habitat for the northern spotted owl (NSO) due to the remaining structure within the stands and the mosaic pattern of the burn in this area.[4] In addition to the downgrading of nesting, roosting, foraging (NRF) habitat to just foraging habitat in the burned LSOG, approximately 1,766 acres of non-LSOG habitat was lost to stand replacement fire in LSR 223. Although this did not affect the amount of LSOG habitat within the LSR it does represent a loss of recruitment habitat that would have developed into LSOG in the coming years. It will now be 80 or more years before these areas attain LSOG habitat characteristics. The habitat conditions in areas of low fire intensity are expected to be largely unchanged as a result of the fire.

It should be noted that not all of the effects of the Stouts Creek Fire were adverse in relation to the creation and maintenance of late successional habitat within LSR 223 on the Umpqua NF. At a landscape scale there is an increase in forest resiliency as a result of understory fuels reduction in areas of lower fire severity. As noted in the Late Successional Reserve Assessment for LSR 223 (USDA, USDI 1999), high fuel loadings above historic levels was one of the main contributing factors to the high risk of stand replacement fire in this area. Low and unburned fire severities composed a larger proportion of the fire than moderate and high levels in LSR 223 on the Umpqua NF (see table 1.0-1). There may also be beneficial effects to late-successional species due to the mosaic burn pattern of the fire which creates canopy openings, edge habitats, large diameter snags, promotes herbaceous/woody hardwood growth, and provides for future large woody debris on the forest floor. All of these can be important habitat features for prey base species that late successional species such as the Northern spotted owl depend on (Bond et al 2009).

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[3] From November 16 thru 19, 2015, personnel from North State Resources (now Stantec) surveyed the fire area including the pipeline route between MP 96 and 109 to assess changed conditions.

[4] Personal communication with David Krantz Forest Service PCGP project coordinator and email with Justin Hadwen wildlife biologist

Figure 1.0-2. Stouts Creek Fire Intensity Map

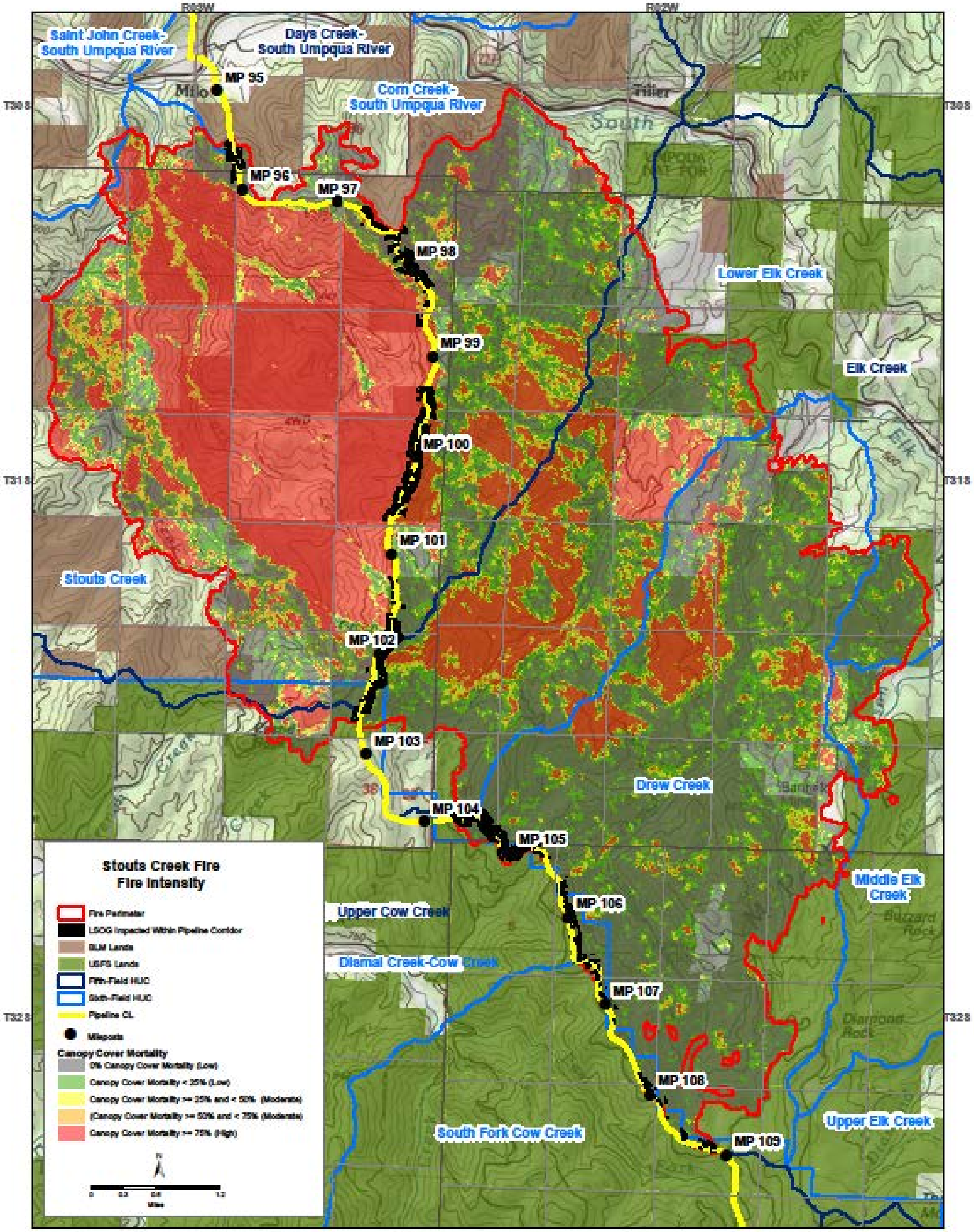


Figure 1.0-3. PCGP Corridor at MP 95.8 Showing an Area of Low Intensity Fire.

Figure 1.0-4. PCGP Corridor at MP 100.1 Showing Area of Moderate and High Intensity Fire

2.0 CHANGED CONDITIONS WITHIN LSR 223 AND THE PROPOSED PCGP CORRIDOR

The Stouts Creek Fire affected portions of the proposed PCGP project on the Umpqua NF within LSR 223 between approximate MP 99.3 to MP 100.7, MP 101.2 to MP 101.9, MP 102.3 to MP 102.7 and from MP 104.2 to MP 108.9. Between MP 99.3 and MP 100.7 the PCGP project is on or near the border between the BLM Roseburg District and the Umpqua NF. Most of the high intensity fire in these areas of the PCGP project occurred between MP 99.3 to MP 100.7 (see figure 1.0-1 and figure 1.0-2).

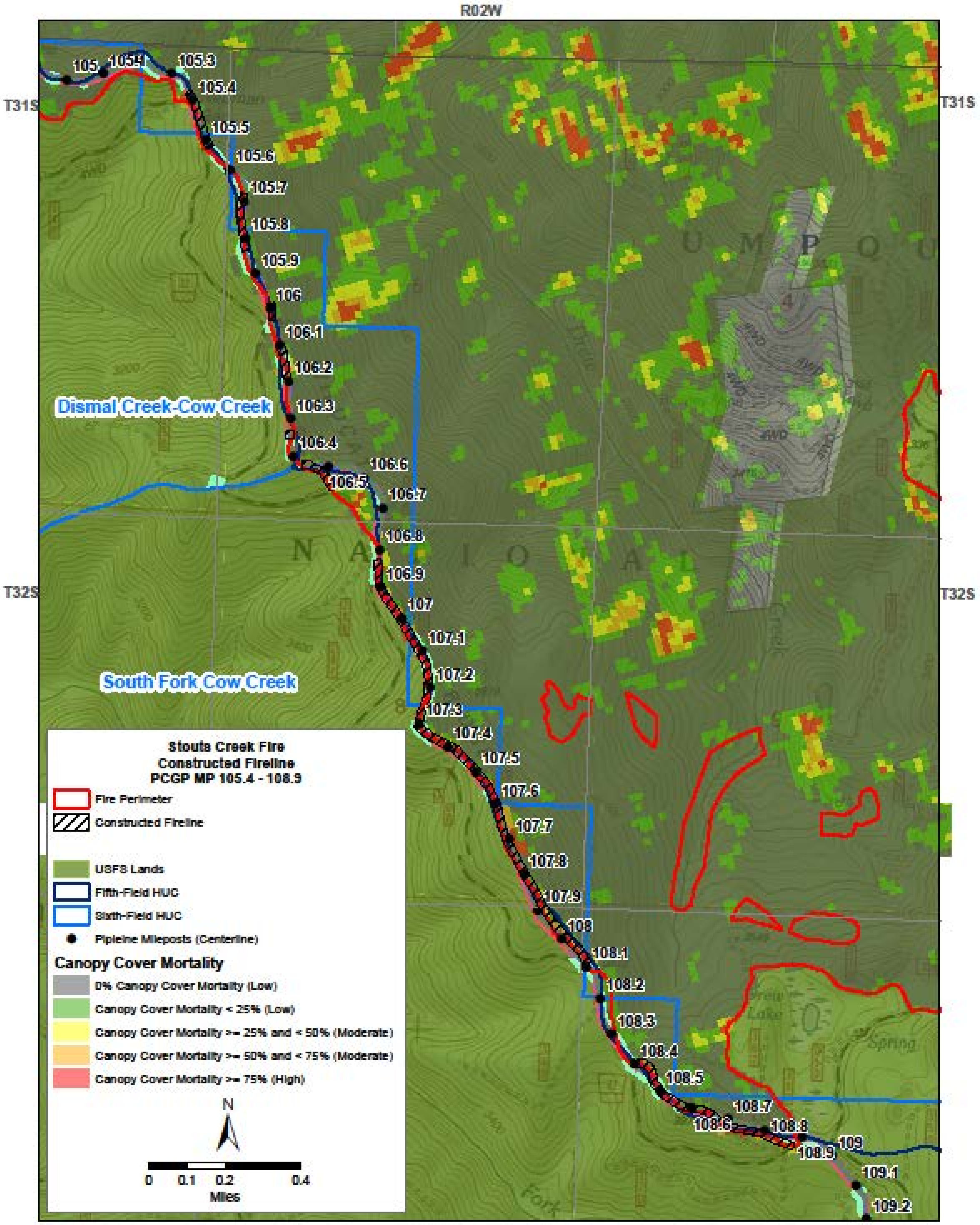
In addition to the impacts of the fire, forest vegetation was also impacted by fire suppression efforts. Along portions of the fire perimeter between MP 105.4 and 108.9 a fireline was constructed for a total of approximately 2.4 miles. The fireline, constructed with bull dozers and timber removal, resulted in a cleared corridor averaging approximately 100 feet wide (see figures 2.0-1 through 2.0-3). The fireline was then utilized as a backfire operation as part of the suppression effort. Since both the proposed PCGP corridor and the fireline utilized the ridgetop in this area, the fireline corridor and the proposed PCGP corridor overlap. Figure 2.0-4 displays the location of the fireline and the PCGP corridor. The breaks between areas of the fireline are either areas where an existing road was used or are areas where only understory trees were removed with most of the forest canopy remaining.

Figure 2.0-1. Constructed Fireline at MP 107.8 of the PCGP Project

Figure 2.0-2. Constructed Fireline at MP 107.4 of the PCGP Project Showing Area Where a Backfire was Ignited as Part of the Suppression Effort

Figure 2.0-3. Constructed Fireline at MP 108.7 of the PCGP Project

Figure 2.0-4. Map of Constructed Fireline between MP 105.4 and MP 108.9 of the PCGP Project



The constructed firebreak lies mostly within the Proposed PCGP corridor but not entirely. There are some areas where the firebreak diverges from the PCGP corridor. Of the approximate 28 acres that were cleared for the construction of the fireline approximately 19 acres overlap with the proposed PCGP corridor. Approximately 3 acres of LSOG habitat were included within these 19 acres. Cumulatively the end result would be a larger corridor than planned (by approximately 9 acres) between MP 105.4 and 108.9 if the PCGP project is approved and constructed.

Although the Stouts Creek Fire did affect habitat conditions in LSR 223 on the Umpqua NF (see section 1.0), the effects the PCGP project would have on LSOG habitat in this area are essentially the same as before the fire. This is because of the 20 acres of LSOG habitat in LSR 223 that would be cleared during construction only 2 acres are in moderate/high fire severity. Since the burned LSOG in this area is still considered to function as foraging habitat, all 20 acres would represent a loss of habitat. There is a small difference in the total amount of LSOG habitat the PCGP would affect since approximately 3 acres of LSOG habitat within the construction right-of-way were removed as part of the suppression efforts.

2.1 COMPENSATORY MITIGATION ACTIONS IN LSR 223 IN THE 2015 PCGP FEIS

A compensatory mitigation plan (CMP) was developed by the Forest Service to address unavoidable adverse impacts that would result from the construction of the PCGP Project (see Section 2.1.4 and Appendix F of the 2015 PCGP FEIS). The proposed off-site mitigation actions for impacts to LSR on the Umpqua NF were discussed in Appendix H and section 4.1.3.6 of the 2015 PCGP FEIS. The primary mitigation for the impacts of the PCGP project on LSR 223 in the 2015 PCGP EIS was the reallocation of approximately 588 acres of Matrix lands to LSR 223. These acres are located on the Umpqua NF and were not affected by the fire.

Figure 2.1-1 displays the proposed off-site mitigation actions related to LSR 223 from the 2015 PCGP FEIS that fall within the fire perimeter. Initial assessment of these proposed actions indicated that several or portions of several were no longer be viable as a result of the fire (see table 2.1-1).

Figure 2.1-1. Map of Off-site mitigation actions in the 2015 PCGP FEIS within the Stouts Creek Fire on the Umpqua NF.

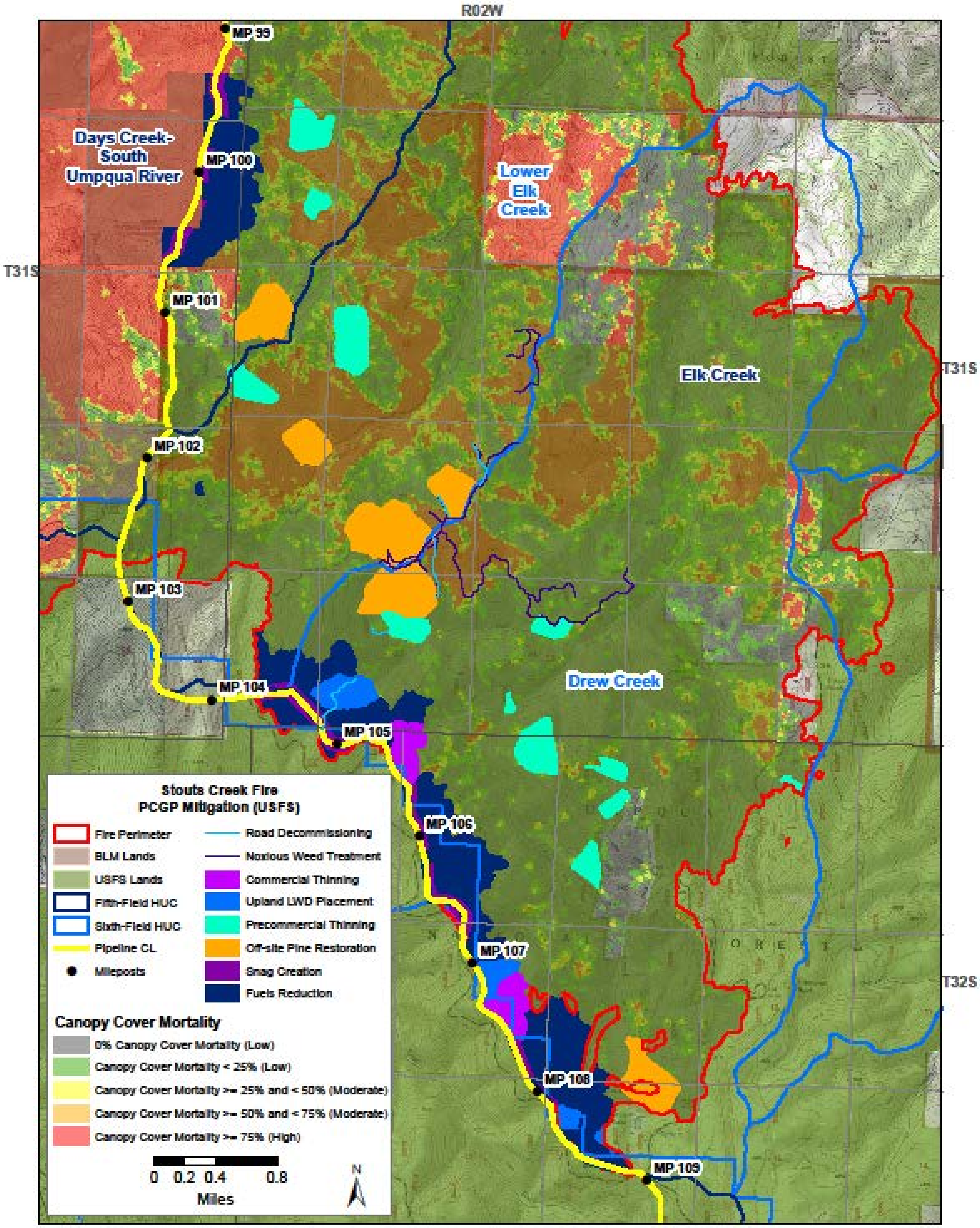


Table 2.1-1

Mitigation project viability within the 2015 Stouts Creek Fire on the Umpqua NF

Mitigation Group	Project Type	Total	Unit	Viable	Unviable	Verify/ Revise
Stand Density, Fuel Reduction and Fuel Break	Integrated Stand Density and Fuel Reduction	717	acres	274	126	317
Stand Density, Fuel Reduction and Fuel Break	Off-site Pine Restoration	397	acres	66	37	294
Stand Density, Fuel Reduction and Fuel Break	Pre-commercial Thinning	329	acres	12	170	147
Terrestrial/Upland Habitat Improvement	Snag Creation	146	acres	40	32	74
Road Sediment and Reduction	Road Decommissioning	3	miles	1	0	2
Stand Density, Fuel Reduction and Fuel Break	Commercial Thinning	94	acres	28	0	66
Terrestrial/Upland Habitat Improvement	LWD Upland Replacement	92	acres	31	0	61

Integrated Stand Density and Fuel Reduction: The objective of this mitigation action is to reduce the risk of loss of LSOG habitat to stand replacement fire. As illustrated in Figure 2.1-1 a portion (approximately 126 acres) of this proposed treatment occurs within areas of high fire intensity. As a result of the fire the treatment prescriptions in these areas may no longer be applicable. A portion of this proposed treatment (approximately 274 acres) occurs within areas of unburned or low fire intensity. In these areas the prescriptions would remain viable. The remaining 317 acres occurs in areas of mixed fire intensity and additional analysis is needed to determine if treatment is still viable or if the fire reduced fuel loadings to meet the objective.

Off-site Pine Restoration: The objective of this mitigation action is to accelerate the development of LSOG habitat within LSR. As shown in Figure 2.1-1 a portion (approximately 32 acres) of this proposed treatment occurs within areas of high fire intensity. As a result of the fire the treatment prescriptions in these areas would no longer be applicable A portion of this proposed treatment (approximately 66 acres) occurs within areas of unburned or low fire intensity. In these areas the prescriptions would remain viable. The remaining 294 acres occurs in areas of mixed fire intensity and additional analysis is needed to determine if treatment is still viable or needs to be revised to meet the objective.

Pre-commercial Thinning: The objective of this mitigation action is to accelerate the development of LSOG habitat within LSR. As shown in Figure 2.1-1 a portion (approximately 170 acres) of this proposed treatment occurs within areas of high fire intensity. As a result of the fire the treatment prescriptions in these areas would no longer be applicable. A portion of this proposed treatment (approximately 12 acres) occurs within areas of unburned or low fire intensity. In these areas the prescriptions would remain viable. The remaining 147 acres occurs in areas of mixed fire intensity and additional analysis is needed to determine if treatment is still viable or needs to be revised to meet the objective.

Snag Creation: The objective of this mitigation action is to compensate for the loss of snags within LSR that would occur from construction of the pipeline. As shown in Figure 2.1-1 a portion (approximately 32 acres) of this proposed treatment occurs within areas of high fire intensity. As a result of the fire, the treatment prescriptions in these areas may no longer be applicable. The areas of high intensity fire resulted in standing dead trees providing numerous snags in these areas. A portion of this proposed treatment (approximately 40 acres) occurs within areas of unburned or low fire intensity. In these areas the prescriptions would remain viable. The remaining 74 acres occurs in areas of mixed fire intensity and additional analysis is needed to determine if treatment is still viable or if the fire in these areas created enough snags to meet the objective.

Road Decommissioning: The objective of this mitigation action as it relates to LSR is to compensate for the fragmentation of LSOG habitat that would occur from pipeline construction. By decommissioning roads and allowing forest vegetation to reclaim the cleared road corridor, fragmentation over time is reduced as the new vegetation matures. As shown in Figure 2.1-1 a portion of the road decommissioning (approximately 1 mile) is in areas of unburned or low intensity wildfire. In these areas this objective could still be met. The remaining 2 miles are in areas of mixed fire intensity and additional analysis would be needed to determine if the objective could still be met in these areas. Road decommissioning can also accomplishes other objectives related to watershed conditions and wildlife habitat. For these reasons road decommissioning may remain a viable mitigation action even if the objective related to LSR was no longer viable.

Commercial Thinning: This mitigation action is part of the integrated stand density fuels reduction treatment. The objectives are both to reduce the risk of stand replacement fire and accelerate the development of LSOG habitat. This treatment continues to appear viable since it occurs mostly in areas of unburned or low intensity fire but additional analysis should be conducted to verify or revise the treatment prescriptions.

LWD Upland Replacement: The objective of this treatment is to mitigate for the loss of recruitment of large down wood within the pipeline construction clearing zone and adjacent stands. This treatment continues to appear viable since it occurs mostly in areas of unburned or low intensity fire but additional analysis should be conducted to verify or revise the treatment prescriptions.

2.2 REVISED COMPENSATORY MITIGATION ACTIONS IN LSR 223 ON THE UMPQUA NF

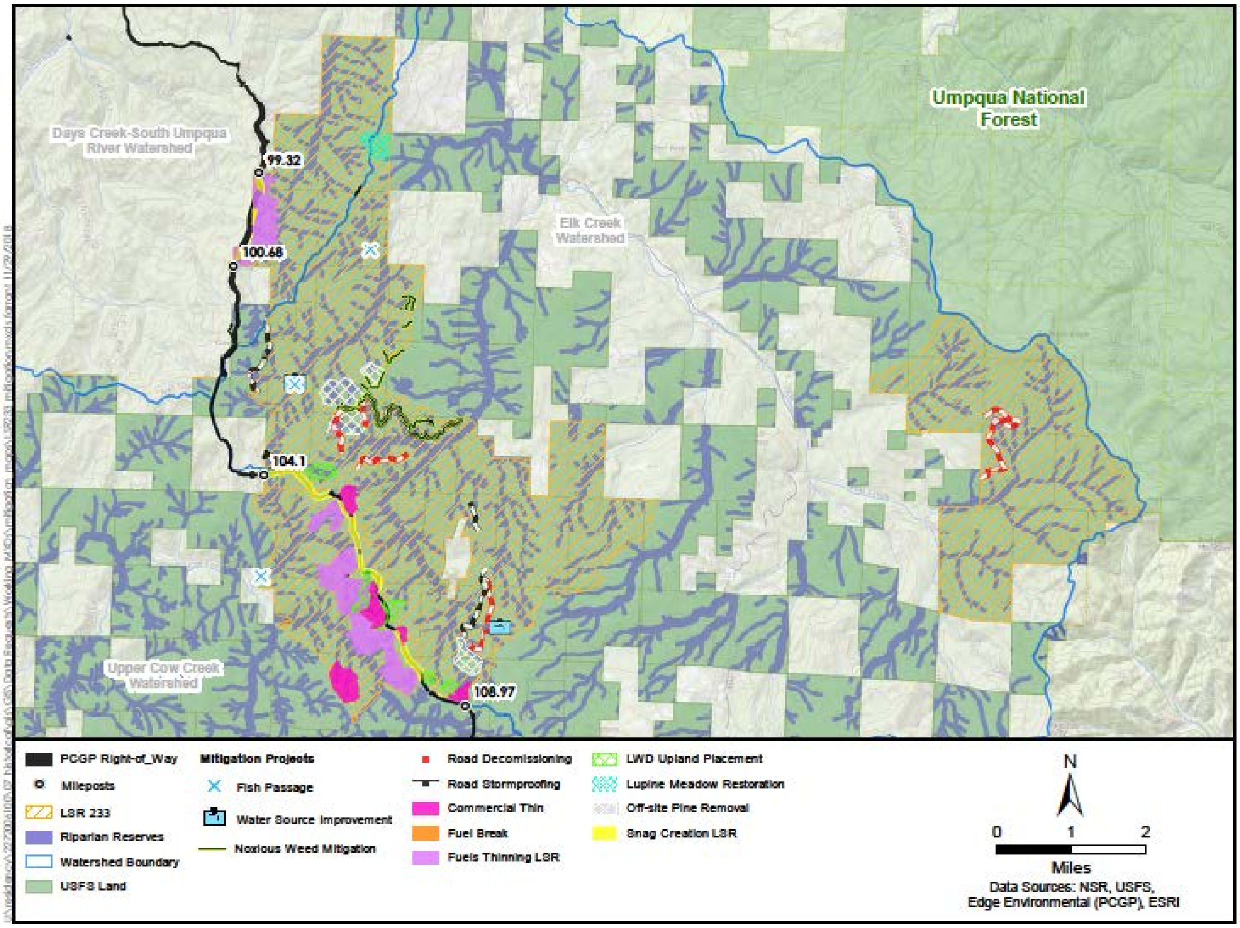
One of the foundations of the CMP was that the proposed mitigation actions remain adaptable to changed conditions or new information as it becomes available. A Forest Service interdisciplinary team of resource professionals including representatives from wildlife, hydrology, fire/fuels, silviculture and others met in 2018 to review the mitigation actions within the Stouts Creek Fire. In April of 2018 the interdisciplinary team met with members from Stantec to review the data on the Stouts Creek fire. At this meeting it was determined that mitigation projects would need to be field reviewed and revised as appropriate as a result of the changed landscape. Stantec staff and the Forest Service interdisciplinary team carried out these field reviews during the spring and summer of 2018. A new proposed mitigation package, based on the results of the field review, was finalized in October 2018. Table 2.2-1 and Figure 2.2-1 display the revised mitigation actions in LSR 223 on the Umpqua NF. These revised mitigation actions will be included in the CMP for the Umpqua NF in the 2019 FERC PCGP DEIS.

Table 2.2-1

Revised Mitigation Actions in LSR 223 on the Umpqua NF

Mitigation Group	Project Type	Total	Unit
Stand Density, Fuel Reduction and Fuel Break	Fuels Thinning	890	acres
Stand Density, Fuel Reduction and Fuel Break	Fuel Break	8	acres
Stand Density, Fuel Reduction and Fuel Break	Pre-commercial Thinning	329	acres
Terrestrial/Upland Habitat Improvement	Snag Creation	190	acres
Road Sediment and Reduction	Road Decommissioning/Storm-proofing	10	miles
Stand Density, Fuel Reduction and Fuel Break	Commercial Thinning	247	acres
Terrestrial/Upland Habitat Improvement	LWD Upland Replacement	164	acres
Stand Density, Fuel Reduction and Fuel Break	Off-site Pine Removal	301	acres
Terrestrial/Upland Habitat Improvement	Lupine Meadow Restoration	80	acres
Terrestrial/Upland Habitat Improvement	Noxious Weed Mitigation	6	miles
Aquatic and Riparian Habitat	Fish Passage	2	sites
Fire Suppression	Water Source Improvement	1	sites

Figure 2.2-1 Map of Revised Mitigations Actions in LSR 223



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4.0 REFERENCES

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APPENDIX F.4

Aquatic Conservation Strategy Assessment

Jordan Cove Natural Gas Liquefaction and Pacific Connector Gas Pipeline Project

Final EIS

Appendix F.4

Aquatic Conservation Strategy Assessment

Pacific Connector Gas Pipeline
Umpqua, Rogue River, and Winema National Forests

Prepared for:

USDA Forest Service

Prepared by:

Stantec

October 2019

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Acronyms Used

ACOE	Army Corps of Engineers
ACS	Aquatic Conservation Strategy
BLM	Bureau of Land Management
BMPs	Best Management Practices
CWA	Clean Water Act
DBH	Diameter at Breast Height
ECRP	Erosion Control and Revegetation Plan
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FEMAT	Forest Ecosystem Management Assessment Team
FLPMA	Federal Land Policy and Management Act
HUC	Hydrologic Unit Code
KOAC	Known Owl Activity Center
KV	Knutsen Vandenberg
KWS	Key Watershed
LMP	Land Management Plan
LRMP	Land and Resource Management Plan
LSOG	Late Successional and Old Growth
LSR	Late Successional Reserve
LWD	Large Woody Debris
MAMU	Marbled Murrelet
MP	Mile Post
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act
NFS	National Forest System
NSO	Northern Spotted Owl
NWFP	Northwest Forest Plan
ODEQ	Oregon Department of Environmental Quality
ODFW	Oregon Department of Fish and Wildlife
OHV	Off-highway Vehicle
OHWM	Ordinary High Water Mark
PCGP	Pacific Connector Gas Pipeline

POD	Plan of Development
PUR	Partnership Umpqua Rivers
Reclamation	U.S. Bureau of Reclamation
REO	Regional Ecosystem Office
RMP	Resource Management Plan
ROD	Record of Decision
RR	Riparian Reserve
SSC	Suspended Sediment Concentration
SSTEMP	Stream Segment Temperature Model
TEWA	Temporary Extra Work Area
TMP	Transportation Management Plan
TSZ	Transient Snow Zone
TSS	Total Suspended Solids
UCSA	Uncleared Storage Area
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WA	Watershed Assessment or Watershed Analysis
WODIP	Western Oregon Digital Imagery Project

1.0 INTRODUCTION

The purpose of this assessment is to provide the information and independent analysis necessary to support findings by USDA Forest Service (Forest Service) decision makers regarding the consistency of the proposed Pacific Connector Gas Pipeline project (PCGP or project) with the Aquatic Conservation Strategy (ACS) contained in Attachment A to the Record of Decision (ROD) for Amendments to Forest Service Planning Documents within the Range of the Northern Spotted Owl (Forest Service and BLM 1994a), also known as the Northwest Forest Plan (NWFP)[1].

The ROD for the NWFP includes a description of the components and objectives of the ACS. The ACS was developed to restore and maintain the ecological health of watersheds and the aquatic ecosystems contained within them on public lands (Forest Service and BLM 1994b: B-9).

The Land and Resource Management Plans (LRMPs) for the Rogue River, Umpqua, and Winema National Forests were amended by the NWFP, including the ACS. It is intended that the ACS be implemented through these Forest Service LRMPs as a landscape-scale management strategy at the site (project), watershed, and regional scales (Forest Service and BLM 1994b).

The proposed PCGP would traverse portions of National Forest System (NFS) lands in the High Cascade, Western Oregon Cascade, and Klamath-Siskiyou provinces, as described in the Report of the Forest Ecosystem Management Assessment Team (FEMAT) that was used to develop the NWFP (Forest Service et al. 1993) (figure 1-1). These provinces are highly diverse in terms of landscapes, climate, and land uses. Natural vegetation ranges from temperate rain forest with more than 120 inches of precipitation a year near the coast to the east-side grasslands near Klamath Lake with an average of 12 inches of precipitation annually that falls primarily as snow. Within these three aquatic provinces, the PCGP would cross NFS lands in portions of seven fifth-field watersheds. Table 1-2 shows the watersheds that would be traversed by the PCGP. The effects of the project must be addressed in the context of site- and watershed-scale conditions for each fifth-field watershed traversed by the project (Goodman et al. 2007).

Complying with the ACS objectives means that the Forest Service must manage the riparian-dependent resources needed to maintain existing conditions and implement actions to restore degraded conditions. Improvement relates to restoring biological and physical processes to their ranges of natural variability. This is a long-term process that may take decades to a century or more for some watersheds, so it is not expected that any single project would completely accomplish this objective; it is expected that projects be designed so as not to prevent attainment of ACS objectives and that actions be taken where possible to restore degraded habitats to their historic range of natural variability (Forest Service and BLM, 1994a, 1994b). Watershed analysis (WA) (also called "watershed assessment") provides the baseline from which to assess the processes necessary for maintaining or restoring watershed conditions. Watershed assessments have been developed for all the fifth-field watersheds where the ACS applies that would be crossed by the PCGP project.

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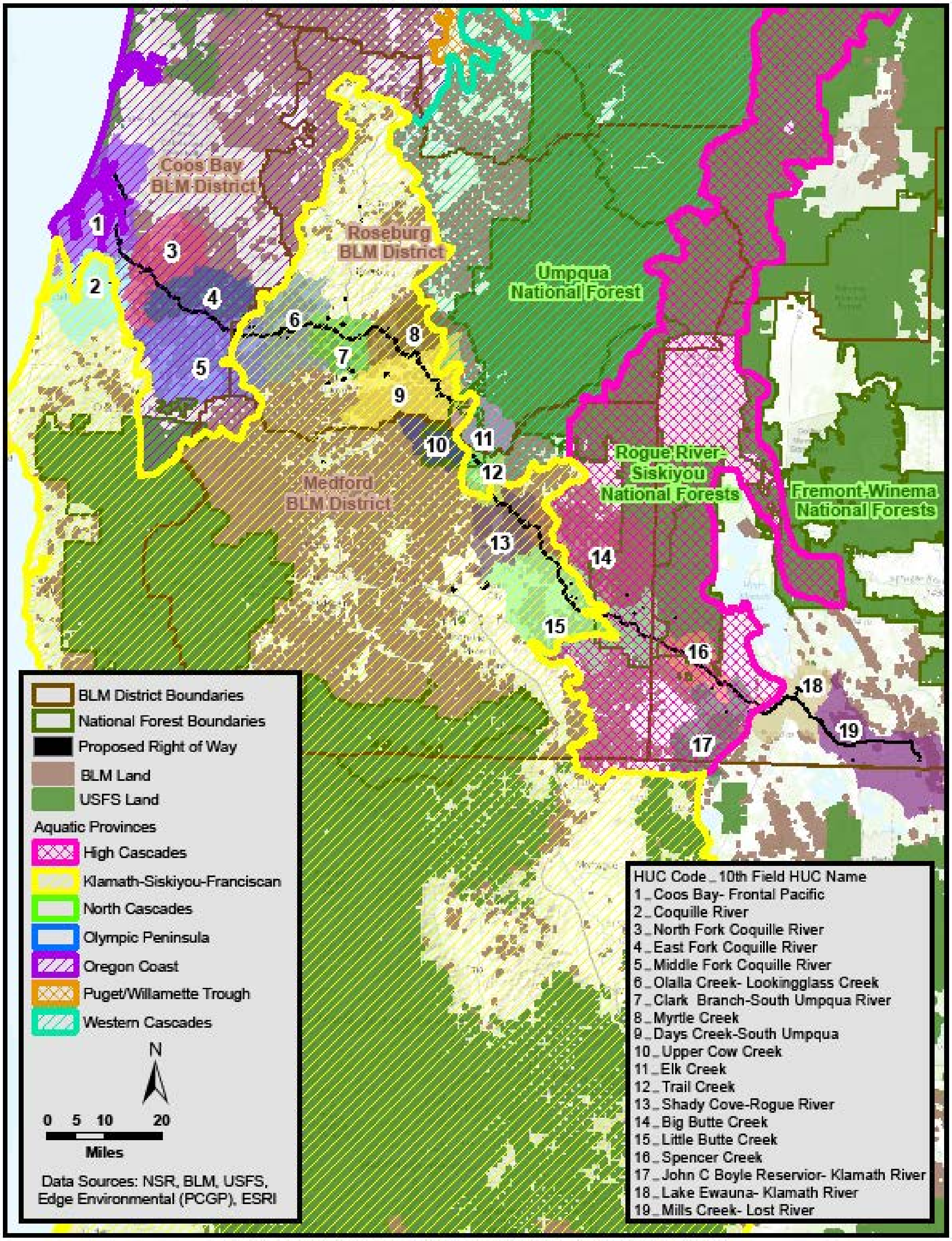
[1] With the adoption of the 2016 Resource Management Plans applicable to the BLM districts associated with the proposed project, the ACS no longer applies to BLM-managed lands.

Figure 1-1 Regional and Provincial Setting of the Pacific Connector Gas Pipeline Route



Since the decision maker must use the results of watershed analyses to support a finding that a project "meets" or "does not prevent attainment" of ACS objectives, this assessment makes full use of the relevant WAs. In order to support such a finding, the analysis must:

- Provide a description of the existing conditions in each fifth-field watershed, including important physical and biological components and processes.
- Evaluate both the immediate (short-term) and the long-term effects of the proposed action.
- Review the effects of the project related to the ACS objectives at the project or site scale as well as at the watershed scale for each of the fifth-field watersheds included in the analysis. The review should consider the incremental effect of the project added to the existing condition and the effects of other present and reasonably foreseeable future actions on watershed conditions.
- Consider any proposed restoration or mitigation activities that are associated with the project.
- The analysis must show that the effects of an action would be within the range of natural variability (Reeves 1999) at the various scales (site to watershed) where the effects occur or that the effects would not prevent attainment of ACS objectives (Forest Service and BLM 1994b: B-10). Minor or short-term adverse effects would not, in and of themselves, constitute noncompliance with the ACS.

The Federal Land Policy and Management Act (FLPMA) of 1976 and the National Forest Management Act (NFMA) of 1976 require that projects or activities be consistent with the LRMP of the Forest Service unit where the activity occurs. Consistency with LRMPs is gauged by whether an activity accomplishes or does not prevent attainment of the goals and objectives of the relevant plan, and whether the activity is consistent with applicable standards and guidelines (36 CFR 219.15). Standards and Guidelines in Forest Service LRMPs are rules that regulate or prohibit activities to ensure that the land management plan objectives are achieved (USDA Office of the General Counsel 2002).

Amendments to land management plans that propose to significantly reduce protection for species associated with late successional old growth (LSOG) forests or to reduce protection for aquatic ecosystems are subject to review by the Regional Ecosystem Office (REO) to determine whether the objectives of the ACS would be significantly affected (Forest Service and BLM 1994b). Amendments of Forest Service land management plans that would require review by the REO are discussed in section 1.3.3 of this appendix.

The governing NWFP standard and guideline for linear projects in Riparian Reserves is LH-4, which states that permits for rights-of-way are to be issued in a way that avoids effects that retard or prevent attainment of ACS objectives (Forest Service and BLM 1994b: C-37). This means that the Bureau of Land Management (BLM) Right-of-Way Grant for the PCGP project must contain the terms and conditions necessary for the project to conform to the ACS on NFS lands. Other standards and guidelines applicable to the ACS are provided in section 1.2.2.

The ROD for the NWFP requires that agency decision makers—in this case, the Forest Supervisor of the Umpqua National Forest—"find" that agency decisions related to the PCGP, and construction and operation of the project itself, "meet" or "do not prevent attainment" of the ACS objectives (Forest Service and BLM 1994b). This finding would be made in the subsequent ROD for concurrence with BLM's decision to issue a Right-of-Way Grant by the Forest Service decisions to amend their LRMPs to accommodate the project. It would be based on evidence and facts presented in the environmental document prepared to comply with the National Environmental Policy Act (NEPA) and appendices, including this ACS assessment.

Private lands dominate the landscape in many of the watersheds that would be crossed by the project. The ACS applies only to lands managed by the Forest Service within the area covered by the NWFP. On private lands, compliance with the Clean Water Act (CWA) is the best evidence of protection of aquatic values. Issuance of permits for the PCGP project under Section 401 of the CWA from the Oregon Department of Environmental Quality (ODEQ) and Section 404 of the CWA from the U.S. Army Corps of Engineers (ACOE) would demonstrate compliance with the CWA. The proponent's application to the Federal Energy Regulatory Commission (FERC) would include the necessary information for the ODEQ and ACOE permits. Section 4.3 of the Final Environmental Impact Statement (FEIS) for the PCGP describes watershed impacts of the project on private lands.

1.1 ORGANIZATION OF THIS ASSESSMENT AND SCALE OF ANALYSIS

The proposed PCGP would cross NFS lands in portions of seven fifth-field[2] watersheds where the ACS applies. To maintain a watershed-scale connection across multiple watersheds, this ACS assessment is structured at the fifth-field watershed scale but provides linkages to the river basin and aquatic province scales. Section 1 provides an overview of the ACS and discusses general project effects. Section 2 provides a regional and river basin context for the watersheds that would be crossed by the PCGP and discusses project effects in each fifth-field watershed; the discussion includes NFS lands by ACS objective. Section 3 provides references.

The discussion for each fifth-field watershed addresses each component of the ACS and considers the existing condition, the range of natural variation as described by the watershed analysis for relevant watersheds, compliance with standards and guidelines of the affected Forest Service LRMPs, and the relationship of the proposed management action to the recommendations of the applicable watershed assessments.

The ACS requires that project impacts be evaluated at multiple scales. While the PCGP is a large project, its impact in any single watershed is typically very small. Modern Geographic Information Systems (GIS) allow precise measurements of project impacts within each watershed. Inventories of land allocations and watersheds at larger scales are rounded to the nearest acre for simplicity. Area measurements at the project scale and the percentage of areas that would be affected by the project are carried to two decimal places to ensure that small portions of the affected landscape are not overlooked. Working at that scale of precision, rounding of small numbers may result in slightly different values for the same data set. In some circumstances, numbers were simply too small to be meaningful. Where numbers would not round up to at least 1/100 of an acre or .01

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[2] A "fifth-field" watershed refers to the hierarchical coding system used by the U.S. Geological Survey to stratify watersheds. A fifth-field watershed is typically 50–200 square miles and is the analytical basis for most Forest Service watershed assessments and ACS assessments.

percent, they are shown as zero. These are very small areas. The table below provides a physical sense of scale that may be useful for readers to evaluate effects.

Unit of Area Measure	Area	Square Dimension	Circular Dimension
1 acre	43,560 square feet	208 feet	117-foot radius circle
0.10 or 1/10 acre	4,356 square feet	66 feet	37-foot radius circle
0.01 or 1/100 acre	437 square feet	21 feet	11.8-foot radius circle

Percentage	Proportion	Portion 100 Acres	Portion of 1,000 Acres
1%	1/100 of a unit.	1 acre out of 100	10 acres out of 1,000
0.1%	1/1,000 of a unit	0.1 acre out of 100	1 acre out of 1,000
0.01%	1/10,000 of a unit	0.01 acre out of 100	1/10th acre out of 1,000

Impacts on the Riparian Reserve and other land allocations and impacts at the subwatershed, watershed, and subbasin scale are described both in acres and as a percentage of the affected land allocation. An impact of 0.1% would affect 1 acre out of 1,000 of a given land allocation or landscape. An impact of 0.01% would affect 1 acre out of 10,000. If the assessment shows the project affecting 0.25% of a watershed, that would equate to

- 0.25 acre or 1/4 acre out of 100 acres,
- 2.5 acres out of 1,000 acres or
- 25 acres out of 10,000 acres.

Inventories at the site scale are precise since they are based on the project corridor and, in many cases, site-specific surveys. Inventories at larger scales are derived from agency inventories or estimates in watershed analyses that are reasoned estimates based on samples or GIS exercises.

Riparian Reserve effects are categorized according to the nature of the construction action.

- Most of the vegetation in the construction corridor and associated Temporary Extra Work Areas (TEWA) are cleared from the designated areas. All trees are removed and most low growing vegetation is cleared. Accordingly, these areas are described as “cleared.”

- Uncleared Storage Areas (UCSA) are places where stumps and other material are stored. In these areas, only smaller trees are cut as needed for safe and efficient operations. In the Riparian Reserves, UCSAs are described as “modified."

For the PCGP project, the nature of effects on a stream channel and its associated Riparian Reserve depends on whether the stream channel is actually crossed by the pipeline trench. In some circumstances, the pipeline trench crosses the stream channel and its associated Riparian Reserve; in other cases, only Riparian Reserve vegetation and/or soil is disturbed or removed and the pipeline trench does not cross a stream channel. These types of impacts are separated in this assessment because a stream channel crossing has different effects than removal of vegetation only.

- Where the pipeline trench crosses a stream channel, the impact on the Riparian Reserve as a result of the corridor clearing and associated TEWAs are described as “crossed.” UCSAs are tallied as they occur in Riparian Reserves where streams are crossed but are counted separately from the area where vegetation is cleared as part of the construction corridor or TEWA.

- Where the “cleared” or “modified” areas affect a portion of the Riparian Reserve but the pipeline trench does not cross the associated stream channel, the affected area is described as “clipped.”

Because of rounding, small differences in GIS layers or the way GIS queries are constructed, there may be slightly different values between inventories in this assessment and those found in Pacific Connector’s resource reports. For example, Pacific Connector's acre estimates may include pipe yards in existing rock pits that are already cleared. Those are not included in this evaluation since the character of the landscape is not changed by the action or use. We do not consider these minor inventory differences to be significant, nor do these minor differences affect conclusions concerning the significance of effects.

1.2 COMPONENTS OF THE AQUATIC CONSERVATION STRATEGY

1.2.1 Riparian Reserves

As a key element of the ACS, Riparian Reserves provide an area along all streams, wetlands, ponds, lakes, and unstable and potentially unstable areas where riparian-dependent resources receive primary emphasis. Riparian Reserves are important to the terrestrial ecosystem as well, serving, for example, as dispersal habitat for certain terrestrial species. Riparian Reserves may be on unstable or potentially unstable terrains (e.g., earthflow, inner gorge). Within Riparian Reserves, specific NWFP standards and guidelines govern land use on NFS lands. These reserves constitute the key ecosystem component of the ACS, as described in the NWFP standards and guidelines. All Riparian Reserves on NFS lands in the fifth-field watersheds crossed by the PCGP corridor are either in the Late Successional Reserve (LSR) or matrix allocation[3].

Under the ACS, Riparian Reserves serve to maintain and restore riparian structure and the functions of intermittent and perennial streams, confer benefits to riparian-dependent and associated species other than fish, enhance habitat conservation for species dependent on the transition zone between upslope and riparian areas, improve travel and dispersal corridors for terrestrial animals and plants, and provide for greater connectivity of the vegetation community within and between watersheds, particularly with regard to LSRs. The width of Riparian Reserves is typically one site-potential tree height (height of mature riparian tree in the particular fifth-field watershed) on each side of wetlands and intermittent and non-fish bearing perennial streams and two potential tree heights on each side of fish-bearing streams. Irrigation ditches do not have Riparian Reserves and are not considered stream crossings.

Unstable areas may also be designated as “Riparian Reserves” so that they can be managed under the framework of the ACS (Forest Service and BLM 1994b: B-30). Potentially unstable areas were initially identified during the project planning process for the PCGP. Areas determined to pose potential risks to either the PCGP project or the surrounding landscapes were further evaluated in the field to ensure that construction and operation of the project would not destabilize these areas.

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[3] Within the hierarchy of land allocations on page A-5 of the Standards and Guidelines for the Northwest Forest Plan, acres of the LSR land allocation are withdrawn before the acres for Riparian Reserves. Some have read this to mean that Standards and Guidelines for Riparian Reserves do not apply in LSRs. That is not correct. The hierarchy on page A-5 is primarily an explanation of inventory layers. Riparian Reserves and their appurtenant standards and guidelines also apply where these reserves overlap with any other land allocations (Forest Service and BLM 1994(b): B-12).

Reviews by licensed engineers and geologists concluded that none of the earthflow terrains that would be crossed by the PCGP were unstable. Therefore, no earthflow terrains that would be crossed by the PCGP were identified as areas that should be mapped as Riparian Reserves because of inherent instability.

Table 1-1 shows estimated acres of Riparian Reserves in each fifth-field watershed crossed by the Pacific Connector project. Acreage estimates were derived from watershed assessments for each of the affected watersheds.

TABLE 1-1

Forest Service Land Allocations in Fifth-Field Watersheds Crossed by the Pacific Connector Project

		Land Ownership (acres)				**Federal Land Allocation (acres)**						
						Late Successional Reserves		**Matrix**		**Riparian Reserves a/**		
Unit	**Unit Total (acres)**	**Other Federal Lands**	**NFS**	**Total Federal**	**Non-Federal Other**	**Other Federal b/**	**NFS**	**Other Federal**	**NFS**	**Other Federal b/**	**NFS**	**Total**
South Umpqua River Sub-Basin												
Myrtle Creek	76,250	31,111	133	31,244	45,006	NA	—	NA	133	NA	54	54
Days Creek S. Umpqua	141,569	57,997	2,807	60,804	80,765	NA	2,417	NA	390	NA	142	142
Elk Creek S. Umpqua	54,356	370	34,187	34,558	19,798	NA	14,271	NA	19,916	NA	12,641	12,641
Upper Cow Creek	47,499	9,866	24,151	34,017	13,482	NA	2,350	NA	21,801	NA	11,827	11,827
South Umpqua River Sub-Basin Total	**319,674**	**99,345**	**61,279**	**160,623**	**159,051**	**NA**	**19,039**	**NA**	**42,240**	**NA**	**24,665**	**24,665**
Upper Rogue River Sub-Basin												
Trail Creek	35,338	14,701	4,353	19,055	16,283	NA	—	NA	4,353	NA	957	957
Big Butte Creek	158,243	29,520	58,181	87,701	70,541	NA	1,636	NA	56,545	NA	8,334	8,334
Little Butte Creek	238,879	54,843	59,900	114,743	124,135	NA	52,813	NA	7,088	NA	5,631	5,631
Upper Rogue River Sub-Basin Total	**432,459**	**99,065**	**122,435**	**221,499**	**210,960**	**NA**	**54,449**	**NA**	**67,986**	**NA**	**14,922**	**14,922**
Upper Klamath Sub-Basin												
Spencer Creek	**54,247**	**8,751**	**22,323**	**31,074**	**23,172**	**NA**	**5,319**	**NA**	**17,004**	**NA**	**535**	**535**
Total All Watersheds	**1,155,305**	**271,855**	**212,495**	**484,349**	**670,955**	**NA**	**78,807**	**NA**	**132,144**	**NA**	**43,295**	**43,295**

a/ Riparian Reserves occur within all land allocations. Acre estimates are derived from watershed assessments for watersheds crossed by the project.
b/ Not applicable to BLM for this table

1.2.2 Key Watersheds

The NWFP identifies "key" watersheds that have regional significance for the protection of water quality and aquatic habitat. Tier 1 Key Watersheds are intended to benefit at-risk fish species and stocks by providing refugia for maintaining and recovering habitat. Tier 2 Key Watersheds provide high-quality water. Key Watersheds include areas of both high quality and degraded habitat. Key Watersheds with high-quality habitat serve as anchors for the potential recovery of depressed stocks. Those of lower quality habitat have a high potential for restoration and would become areas of high-quality habitat if appropriate restoration measures are implemented. The NWFP designates Key Watersheds as the highest priority for restoration. Table 1-2 identifies Key Watersheds that would be crossed by the PCGP right-of-way.

TABLE 1-2

Miles of PCGP Project Right-of-Way in Key Watersheds by Administrative Unit

Watershed	Umpqua NF Miles	Rogue River NF Miles	Winema NF Miles	Total NF Miles
Elk Cr.-South Umpqua	2.66	—	—	2.66
Days Cr. South Umpqua (Tier 1) (These 5th field watersheds are both part of the South Umpqua Key Watershed)	1.56	—	—	1.56
North and South Forks Subwatersheds, Little Butte Cr. (Tier 1)	—	8.56	—	8.56
Spencer Cr. (Tier 1)	—	—	6.05	6.05
Clover Cr. Subwatershed, Spencer Cr.(Tier 2)	—	—	—	—
Total	**4.22**	**8.56**	**6.05**	**18.83**

Source: Resource Report 2, table 2.2-4

1.2.3 Watershed Analysis

The ACS establishes procedures for conducting watershed analyses (documented in a "watershed analysis" or "watershed assessment") to provide a baseline for geomorphic and ecologic processes operating at the watershed level. Watershed assessments provide the framework for formulating monitoring and restoration programs, delineating Riparian Reserves, and describing the desired future condition for these watersheds. Watershed assessments provide information but they are not decision documents; they do not authorize or prohibit projects or change decisions made in LRMPs or project-level NEPA documents.

Watershed condition refers to more than the state of stream channels and riparian area. It also includes the condition of the uplands, type and distribution of seral classes of vegetation, land use history, effects of previous natural and land use–related disturbances, and distribution and abundance of species and populations throughout the watershed. All of these attributes can influence the structure and function of aquatic and riparian ecosystems.

Effective protection strategies for riparian and aquatic habitat on NFS lands under the jurisdiction of the ACS must accommodate the wide variability of landscape conditions across the Pacific

Northwest. Watershed assessments play a key role in the ACS process by ensuring that protection of aquatic systems is tailored to the specific landscape(s) at the appropriate scale(s).

Watershed assessments have been completed for all of the fifth-field watersheds where NFS lands would be crossed by the PCPG project. For this ACS assessment, each watershed assessment was reviewed, and key information was summarized and synthesized. Since most of the watershed assessments were written between 10 and 15 years ago, the descriptions of current conditions were updated with information from recently published NWFP Monitoring Reports (Forest Service and BLM 2011, 2011a, 2012) and communication with local field units. A combination of updated information and the original watershed analysis was used to describe the important physical and biological processes and components of each fifth-field watershed crossed by the PCGP on NFS lands. Table 1-3 lists the watershed assessments reviewed for this assessment.

TABLE 1-3

Watershed Assessments Reviewed for Watersheds Affected by the Pacific Connector Project

Fifth-Field Watershed	Watershed Assessment
Days Creek South Umpqua	Bureau of Land Management. 2001. South Umpqua Watershed Analysis and Water Quality Restoration Plan, Second Iteration. Bureau of Land Management, Roseburg District, South River Resource Area. Roseburg, OR. March 2, 2001.
Elk Creek South Umpqua	Forest Service. 1996. Elk Creek Watershed Analysis. Forest Service, Umpqua National Forest, Tiller Ranger District. Roseburg, OR. October 16, 1996.
Upper Cow Creek	Forest Service. 1995a. Cow Creek Watershed Analysis. Forest Service, Umpqua National Forest, Tiller Ranger District, Roseburg OR. September 30, 1995
Trail Creek	Bureau of Land Management. 1999b. Trail Creek Watershed Assessment. Prepared by Western Watershed Analysts. Bureau of Land Management, Medford District. Medford, OR. June 1999.
Big Butte Creek	Forest Service 1995b. Upper Big Butte Creek Watershed Analysis. Rogue River National Forest, Butte Falls Ranger District. Medford, OR. December 1, 1995 Bureau of Land Management. 1999d. Lower Big Butte Watershed Analysis. Bureau of Land Management, Medford District, Butte Falls Resource Area. Medford, OR. September 1999.
Little Butte Creek	Bureau of Land Management and Forest Service. 1997. Little Butte Creek Watershed Assessment, Version 1.2. Bureau of Land Management, Medford District, Ashland Resource Area, Rogue River National Forest, Ashland Ranger District, Medford, OR. November 1997.
Spencer Creek	Bureau of Land Management, USDA Forest Service, U.S. Environmental Protection Agency, and U.S. Fish and Wildlife Service. 1995. Spencer Creek Pilot Watershed Analysis. Lakeview District, Bureau of Land Management, Lakeview District and Klamath Falls Resource Area; USDA Forest Service, Winema National Forest; U.S. Environmental Protection Agency; and U.S. Fish and Wildlife Service. August 1995.

1.2.4 Watershed Restoration

Watershed restoration is intended to be a comprehensive, long-term program to restore watershed health and aquatic ecosystems, including habitats that support riparian-dependent and riparian-related organisms. Watershed restoration recommendations in the watershed assessments provided guidance for the development of the Forest Service mitigation plan developed in conjunction with the project proponent for the PCGP project[4]. For example, a key element of the mitigation plan is upgrading or removing (decommissioning) roads. Such actions have been shown to be effective in controlling runoff and reducing sediment transport to aquatic habitats. Mitigation projects also include channel stabilization and restoration elements that would enhance channel and aquatic

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[4] The mitigation plan is presented in Appendix F.2 of the FEIS.

habitat complexity by placing large woody debris (LWD) in selected stream reaches. Another key element is accelerating the growth of large trees in the Riparian Reserves by thinning and fuels reduction to reduce the risk of stand-replacing fire in the reserves. These measures and others recommended in watershed assessments and recovery plans for threatened or endangered species guided development of mitigation measures, with the intent that those measures contribute to watershed restoration objectives wherever possible.

These components—Riparian Reserves, Key Watersheds, watershed analysis, and watershed restoration—are designed to operate together to maintain and restore the productivity and resiliency of riparian and aquatic ecosystems. Late-Successional Reserves are also an important component of the ACS. The standards and guidelines under which LSRs are managed provide increased protection for water bodies and potential unstable stream types. Because these reserves possess late-successional characteristics, they offer core areas of high-quality stream habitat that would act as refugia and centers from which degraded areas can be recolonized as they recover. Streams in these reserves may be particularly important for endemic or locally distributed fish species and stocks (Forest Service and BLM 1994b: B-12).

1.3 DETERMINING CONSISTENCY WITH THE ACS

1.3.1 ACS Objectives

The nine objectives of the ACS are listed in appendix B of the Standards and Guidelines for the NWFP (Forest Service and BLM 1994b). Accordingly, NFS lands within the range of the northern spotted owl would be managed to:

1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.

2. Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life-history requirements of aquatic and riparian-dependent species.

3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, right-of-way, reproduction, and migration of individuals composing aquatic and riparian communities.

5. Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

6. Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.
7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.
8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation; nutrient filtering; and appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.
9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.

These ACS objectives provide a framework for managing aquatic ecosystems, with a focus at the fifth-field watershed and aquatic province (i.e., multiple watershed) scales. They address the distribution and attributes of aquatic ecosystems believed necessary to maintain viable populations of fish and other aquatic and riparian-dependent species and to recover degraded ecosystems. The objectives are intended to be flexible in that they can be applied at all spatial scales of concern. Application of the ACS is intended to maintain or move aquatic ecosystem functioning toward the range of natural variability at these several scales (Reeves 1999).

1.3.2 Standards, Guidelines, and Management Direction

Standards and guidelines are implementation rules designed to regulate or prohibit activities to ensure that the objectives associated with a given land allocation are achieved. In other words, by following the standards and guidelines for a given activity, the project or activity should not prevent attainment of objectives. In the NWFP, some standards and guidelines are applicable to all activities in all land allocations while others are specific to a particular activity and/or land allocation. The NWFP standards and guidelines for management activities are important for meeting ACS objectives (Reeves et al. 2006). These standards and guidelines were developed specifically to regulate or prohibit activities that may prevent attainment of ACS objectives. The efficacy of these standards and guidelines for achieving the desired benefits of fish habitat protection and restoration are described in the EIS for the NWFP (Forest Service and BLM 1994c).

The NWFP clearly anticipated that development projects, including utility corridors, could occur in Key Watersheds and Riparian Reserves, and provided standards and guidelines to ensure that ACS objectives would be achieved if such projects were implemented (table 1-4 below). All relevant standards and guidelines in Table 1-4 except those related to protection of Survey and Manage (S&M) species are specific to Riparian Reserves. Evaluating compliance with these relevant standards and guidelines is an essential step for determining consistency with ACS objectives. Table 1-4 cross-references NWFP standards and guidelines.

Standard and Guideline LH-4 is the governing ACS direction for new developments that may affect aquatic resources. This standard and guideline does not prohibit new developments; rather, it directs the Forest Service to include terms and conditions in right-of-way grants to ensure that

ACS objectives are achieved. The Right-of-Way Grant issued by the BLM for the project would include a Plan of Development (POD) with 28 attachments, including an Erosion Control and Revegetation Plan (ECRP), a Wetland and Waterbody Crossing Plan, a Transportation Management Plan (TMP), and a Comprehensive Mitigation Plan that are intended to ensure compliance with standards and guidelines and accomplishment of ACS objectives. The POD attachments are conditions of the Right-of-Way Grant and are binding on the applicant.

TABLE 1-4

Governing NWFP Standards and Guidelines Relevant to the ACS for Utility Corridors

Standard/Guideline	Land Allocation	Description	Applicability
Standards and Guidelines Applicable to New Developments			
LH-4: Issuing leases, permits, rights-of-way and easements.	Riparian Reserves	For activities other than surface water developments, issue leases, permits, rights-of-way, and easements to avoid adverse effects that retard or prevent attainment of Aquatic Conservation Strategy objectives.	Directs the Forest Service to include terms and conditions in right-of-way grants to ensure that ACS objectives are achieved.
Standards and Guidelines Related to Road Construction, Reconstruction, and Maintenance			
RA-4: Locating water withdrawal sites.	Riparian Reserves	Locate water-drafting sites to minimize adverse effects on stream channel stability, sedimentation, and instream flows needed to maintain riparian resources, channel conditions, and fish habitat.	Applicable to water drafting sites for construction needs such as compaction, dust control, and hydrostatic testing.
RF-2: Road construction standards and guidelines.	Riparian Reserves	For each existing or planned road, meet Aquatic Conservation Strategy objectives by: a. minimizing road and landing locations in Riparian Reserves. b. completing watershed analyses (including appropriate geotechnical analyses) prior to construction of new roads or landings in Riparian Reserves. c. preparing road design criteria, elements, and standards that govern construction and reconstruction. d. preparing operation and maintenance criteria that govern road operation, maintenance, and management. e. minimizing disruption of natural hydrologic flow paths, including diversion of streamflow and interception of surface and subsurface flow. f. restricting sidecasting as necessary to prevent the introduction of sediment to streams. g. avoiding wetlands entirely when constructing new roads.	Applicable to roads constructed or reconstructed for the PCGP. Objectives of this Standard and Guideline are accomplished through the terms of the Right-of-Way grant, which includes a TMP as an attachment to the POD.
RF-4: New culverts, bridges and other stream crossings.	Riparian Reserves	New culverts, bridges, and other stream crossings shall be constructed, and existing culverts, bridges, and other stream crossings determined to pose a substantial risk to riparian conditions would be improved to accommodate at least the 100-year flood, including associated bedload and debris. Priority for upgrading would be based on the potential impact and the ecological value of the riparian resources affected. Crossings would be constructed and maintained to prevent diversion of streamflow out of the channel and down the road in the event of crossing failure.	Provides direction for construction or reconstruction of permanent road crossings associated with the PCGP project through the TMP. (RF-4 is not applicable to crossings associated with the pipeline corridor because the pipeline is not a road.)

TABLE 1-4

Governing NWFP Standards and Guidelines Relevant to the ACS for Utility Corridors

Standard/Guideline	Land Allocation	Description	Applicability
RF-5: Minimizing sediment delivery from roads.	Riparian Reserves	Minimize sediment delivery to streams from roads. Outsloping of the roadway surface is preferred, except in cases where outsloping would increase sediment delivery to streams or where outsloping is unfeasible or unsafe. Route road drainage away from potentially unstable channels, fills, and hillslopes.	Applicable to the roads constructed, reconstructed, and maintained by the PCGP. RF-5 is accomplished through the terms of the TMP.
RF-6: Maintaining fish passage.	Riparian Reserves	Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams.	Applicable to stream crossings constructed or reconstructed by the PCGP. RF-6 is accomplished through the terms of the TMP.
RF-7: Transportation Management Plan development.	Riparian Reserves	Develop and implement a Road Management Plan or a TMP that would meet the Aquatic Conservation Strategy objectives. As a minimum, this plan shall include provisions for the following activities: a. inspections and maintenance during storm events. b. inspections and maintenance after storm events. c. road operation and maintenance, giving high priority to identifying and correcting road drainage problems that contribute to degrading riparian resources. d. traffic regulation during wet periods to prevent damage to riparian resources. e. establish the purpose of each road by developing the Road Management Objective.	Applicable to roads used by the PCGP during construction and operation of the project. RF-7 is accomplished through the terms of the TMP.
Standards and Guidelines Applicable to Mitigation Measures and Watershed Restoration			
WR-3: Proper use of planned mitigation and restoration.	Riparian Reserves	Do not use mitigation or planned restoration as a substitute for preventing habitat degradation.	Applicable to the project. Mitigation measures are not to be used as a substitute for appropriate design measures or applications of Best Management Practices.

TABLE 1-4

Governing NWFP Standards and Guidelines Relevant to the ACS for Utility Corridors

Standard/Guideline	Land Allocation	Description	Applicability
Standards and Guidelines for Survey and Manage Species			
Management direction for Survey and Manage Species in the NWFP ROD was replaced by the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines as Modified by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.)	All Allocations	Survey and Manage species protection is a mitigation measure to ensure the persistence of species listed in the 2001 Survey and Manage ROD, as amended by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.)	Applicable to the known sites of Survey and Manage species that are dependent on riparian habitats and whose persistence in the area of the NWFP would be threatened by construction of the PCGP. This is responsive to ACS objective 9.
Standards and Guidelines for Retention of Late Successional Forest			
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction would be applied in fifth-field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15% or less late-successional forest. (The assessment of 15% would include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands.	All Allocations	Landscape areas where little late-successional forest persists should be managed to retain late-successional patches. This standard and guideline would be applied in fifth-field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15% or less late-successional forest. This assessment should include all allocations in the watershed. Within such an area, all remaining late-successional stands should be protected.	Applicable in each watershed affected by the project. This evaluation is included in the ACS evaluation since it is watershed-based. None of the watersheds that would be crossed by the PCGP are below the 15% threshold or would be reduced below the 15% threshold by the project.
Standards and Guidelines Related to Key Watersheds a/			
Outside Roadless Areas – Reduce existing system and nonsystem road mileage. If funding is insufficient to implement reductions, there would be no net increase in the amount of roads in Key Watersheds.	Key Watersheds	Where opportunities exist, system and nonsystem road miles should be reduced in Key Watersheds. This is accomplished by off-site mitigation measures.	Applicable in all Key Watersheds. Mitigation plans document relationship of projects to Key Watershed objectives.
Key Watersheds are highest priority for watershed restoration.	Key Watersheds	Watershed restoration accomplished with project mitigation should prioritize Key Watersheds commensurate with project effects.	Applicable in all Key Watersheds. Mitigation plans document relationship of projects to Key Watershed objectives.

TABLE 1-4

Governing NWFP Standards and Guidelines Relevant to the ACS for Utility Corridors

Standard/Guideline	Land Allocation	Description	Applicability
Watershed analysis is required prior to management activities, except minor activities such as those Categorically Excluded under NEPA (and not including timber harvest). Watershed analysis is required prior to timber harvest.	Key Watersheds	This requires a Watershed Assessment to be completed prior to activities that affect vegetation in Key Watersheds.	Applicable in Key Watersheds. All Key Watersheds crossed by the PCGP have completed watershed assessments. While the Pacific Connector project is neither a “management activity” related to LRMP implementation nor a “timber harvest,” watershed assessments provide useful information to ensure objectives of Key Watersheds are attained.
Standards and Guidelines for All Land Allocations Related to Watershed Analysis			
Watershed analysis is required to change Riparian Reserves widths in all watersheds.	Riparian Reserves	Modification of Riparian Reserve widths requires a Watershed Assessment.	The Forest Service does not propose to modify Riparian Reserve widths; however, the PCGP would cross Riparian Reserves. Watershed assessments have been completed for all watersheds that would be crossed by the PCGP. Watershed assessments provide useful information to assess crossing effects. None of the watershed assessments made a recommendation to prohibit crossings of Riparian Reserves.

a/ Standards and Guidelines for Key Watersheds also prohibit new road construction in Inventoried Roadless Areas (RARE II). The Pacific Connector project does not cross any portion of, or construct any roads in, RARE II Inventoried Roadless Areas.

1.3.3 Forest Service Decisions Related to the ACS

Proposals to amend NFS land management plans must consider whether the proposed amendments are related to the ACS; if so, the proposals must address whether the proposed changes to the land management plans would retard or prevent attainment of ACS objectives. BLM's decision concerning whether or not to issue a right-of-way grant for the PCGP project must also consider whether issuing the grant would prevent attainment of ACS objectives. Land management plan amendments that propose to significantly reduce protection for LSOG-related species or reduce protection for aquatic ecosystems are subject to review by the REO to determine if the objectives of the NWFP standards and guidelines would be significantly affected (Forest Service and BLM 1994b: C-29).

Table 1-5 shows which of the proposed land management plan amendments associated with the PCGP project have a nexus with the ACS and whether those amendments require review by the REO.

TABLE 1-5

Agency Decisions with a Nexus to the ACS

Amendment Number	Relevant Federal Jurisdiction	Amendment Description	ACS Nexus	REO Review Required for Aquatic Effects
Forest Service-1	All Forest Service jurisdictions	Waive management recommendations for Survey and Manage species	Yes	Yes. This amendment may reduce protections for aquatic-related Survey and Manage species (ACS Objective 9).
RRNF-1	Rogue River National Forest	Establishes a Forest goal to facilitate transmission of energy	No	No
RRNF-2	Rogue River National Forest	Changes the Visual Quality Objective where the PCGP would cross Big Elk Road	No	No
RRNF-4	Rogue River National Forest	Changes the Visual Quality Objective where the PCGP would cross Highway 140	No	No
RRNF-5	Rogue River National Forest	Allows the PCGP to cross approximately 2.5 acres of the Restricted Riparian Land Allocation	Yes	Yes. This amendment reduces protection of aquatic habitats by allowing removal of riparian vegetation.
RRNF-6	Rogue River National Forest	Allows the PCGP to exceed restrictions on detrimental soil conditions from displacement and compaction within the project right-of-way on an estimated 60 acres	Yes	Yes. This amendment reduces protection of aquatic habitats by allowing some measure of soil compaction and displacement within Riparian Reserves.
RRNF-7	Rogue River National Forest	Transfers 512 acres from the Matrix Land Allocation to LSR RO 227 while done as a mitigation for impacts to LSRs; also provides additional protections for Riparian Reserves	Yes	No. This amendment does not reduce protections for aquatic habitats. However, it would be reviewed by the REO because it involves LSRs.
UNF-1	Umpqua National Forest	Amends standards and guidelines for Fisheries and Water Quality to allow the removal of 3 acres of effective shading vegetation where perennial streams would be crossed by the PCGP	Yes	Yes. This amendment reduces protection of aquatic habitats by allowing removal of effective shade.

TABLE 1-5

Agency Decisions with a Nexus to the ACS

Amendment Number	Relevant Federal Jurisdiction	Amendment Description	ACS Nexus	REO Review Required for Aquatic Effects
UNF-3	Umpqua National Forest	Allows the PCGP to exceed restrictions on detrimental soil conditions on an estimated 70 acres from displacement and compaction within the project right-of-way	Yes	Yes. This amendment reduces protection of aquatic habitats by allowing some measure of soil compaction and displacement within Riparian Reserves.
UNF-4	Umpqua National Forest	Transfers approximately 588 acres from the Matrix Allocation to the LSR 223 land allocation while done as a mitigation for impacts to LSRs; also provides additional protections for Riparian Reserves.	Yes	No. This amendment does not reduce protections for aquatic habitats. However, it would be reviewed by the REO because it involves LSRs.
WNF-1	Winema National Forest	Amends Standards and Guidelines for Management Area 3 on page 4-103-4, to allow the 95-foot-wide PCGP corridor in MA-3 from the Forest boundary to the Clover Creek Road corridor	No	No.
WNF-2	Winema National Forest	Allows more time to achieve Visual Quality Objectives in the vicinity where the 75-foot-wide PCGP corridor would cross the Dead Indian Memorial Highway	No	No.
WNF-3	Winema National Forest	Allows more time to meet Visual Quality Objectives for Scenic Management, Foreground Partial Retention, where the PCGP would be in the vicinity of the Clover Creek Road corridor	No	No
WNF-4	Winema National Forest	Allows the PCGP to exceed restrictions on detrimental soil conditions on an estimated 30 acres from displacement and compaction within the project right-of-way	Yes	Yes. This amendment reduces protection of aquatic habitats by allowing some measure of soil compaction and displacement within Riparian Reserves.
WNF-5	Winema National Forest	Allows the PCGP to exceed restrictions on detrimental soil conditions from displacement and compaction on an estimated 4 acres within the project right-of-way that lies within Management Area 8 Riparian Area	Yes	Yes. This amendment reduces protection of aquatic habitats by allowing some measure of soil compaction and displacement within Riparian Reserves.

1.3.4 Determining Consistency with the ACS at Multiple Scales

The ACS does not prohibit project-level impacts so long as the effects of the action do not retard or prevent attainment of ACS objectives (Forest Service and BLM 1994b: B-9). Project impacts that result in minor and short-term degradation of the aquatic habitat do not necessarily constitute noncompliance with the ACS. Where impacts do occur, the analysis must show they are within the range of natural variability for the watershed where they occur or that the action would move the key processes that influence Riparian Reserves toward the range of natural variability (Reeves 1996).

Under the ACS, a project cannot have a long-term negative effect on riparian-dependent resources (Forest Service and BLM 1994c: 3&4 68-69). For example, short-term “pulse” disturbances that result in the deposition of sediment in amounts and texture that mimic natural events may fall within the range of natural variability for a watershed and would likely not prevent attainment of ACS objectives. Conversely, actions that result in the chronic deposition of fine sediments that do not fall within the range of natural variability in a given watershed probably would not be consistent with the ACS. In all cases, agency decision makers must use the scale, duration, and intensity of impacts and professional judgment to determine whether an action prevents attainment of ACS objectives.

Spatial scales are defined as follows:

- The "site" in the context of this ACS assessment varies in size depending on effects. It encompasses the project footprint and areas of potential direct or indirect effects adjacent to the project location. The definition of "site" is variable and is intended to reflect the ecological function and variable nature of riparian areas. The "site" may encompass areas outside of Riparian Reserves.
- The "subwatershed" is the sixth field Hydrologic Unit Code (HUC) scale as defined by the U.S. Geological Survey (USGS).
- The "watershed" is the fifth-field HUC scale as defined by the USGS.
- The "sub-basin" is an aggregation of fifth-field watersheds into one logical drainage (i.e., the South Umpqua sub-basin), typically at the fourth-field HUC scale. In the Coast Range Province, it may include small drainages that are not part of a larger river system but have common beneficial use and resource concerns.
- The "basin" is an aggregation of fourth-field sub-basins into a logical drainage. Basins (i.e., the Umpqua Basin) are generally described at the third-field HUC scale.
- The "province" refers to the physiographic (also called aquatic) provinces established in the Report of the FEMAT (Forest Service et al. 1993: IV-7). These are areas of similar geologic and general climatic conditions.
- "Riparian Reserves" are land allocations in Forest Service LRMPs where special standards and guidelines apply. Riparian Reserves adjacent to fish-bearing streams are two site-potential tree heights wide. Riparian Reserves on wetlands and other waterbodies are one site-potential tree height wide.

Temporal scales and intensity of effects are defined as follows:

- Short-term effects are generally limited to the season(s) of construction.
- Long-term effects are those that would persist beyond the season(s) of construction.
- Minor effects are defined as effects that are confined to the general construction site. They either are "short-term" effects or "longer term" effects that are within the range of variability at the scale where the impact occurs and that do not prevent attainment of ACS objectives.
- Effects that are not "minor" are those that are outside the range of natural variability and would prevent attainment of ACS objectives.
- "Cumulative impact" is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future

actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7). Only current and future projects that have environmental consequences that overlap the proposed PCGP spatially and temporally contribute to cumulative effects within the watershed. Cumulative effects are described in the individual watershed sections of this assessment.

The consistency of the project with the ACS is demonstrated by:

- Using watershed assessments to describe watershed conditions and ranges of natural variability for key physical and biological processes for each fifth-field watershed that would be crossed by the PCGP project.
- Evaluating direct, indirect, and cumulative effects at the site and watershed scales against the nine ACS objectives for each fifth-field watershed.
- Compliance with applicable agency management direction (i.e., NWFP standards and guidelines, table 1-4 above).
- Showing that the environmental consequences of agency decisions regarding land management plan amendments (see table 1-5) do not prevent attainment of ACS objectives.
- REO review of any proposed amendments of NWFP standards and guidelines that have been incorporated into land management plans that would reduce protections for aquatic resources. The purpose of this review is to determine if the objectives of standards and guidelines for the ACS would be significantly adversely affected by the proposed amendment(s) (see table 1-5).
- A finding by the agency decision makers in the ROD for the project FEIS, based on evidence and facts presented in the PCGP project FEIS and its appendices, that the action taken by the Forest Service (see first paragraph in section 1.2.3.) would not prevent attainment of the ACS objectives at the appropriate scales.

The Forest Service uses a three-tiered condition class rating (Forest Service 2011) applied at either the fifth-field or the sixth-field subwatershed HUC. In the Forest Service condition class rating, properly functioning subwatersheds (Condition Class I) are resilient and able to recover to the desired condition when or if disturbed by large natural disturbances or land management activities. Functioning at risk (Condition Class II) subwatersheds maintain elements of ecological integrity but may lack the resilience to recover from large-scale disturbances or management activities that have a significant adverse impact on watershed function. Functionally impaired (Condition Class III) subwatersheds lack resilience because some physical, hydrological, or biological threshold has been exceeded. Where available, Forest Service fifth -field and sixth-field HUC condition class assessments have been included in the individual watershed discussions and are found in section 2.2 of this appendix.

Table 1-6 delineates the factors and indicators for the proper functioning of at-risk streams. These are applied in determining the three condition classes described above. This table also provides a description for “not functioning” conditions.

TABLE 1-6

General Matrix of Factors and Indicators of Aquatic Health

Factors a/	**Indicators**	**Properly Functioning**	**At Risk**	**Not Properly Functioning**
Water Quality	Temperature	2nd and 3rd order streams: <58 degrees F. 4th order and larger streams: <65 degrees F.	2nd and 3rd order: 59–65 degrees F. 4th order and larger basins: 66–72 degrees F.	2nd and 3rd order streams: >65 degrees F. 4th order and larger basins: >72 degrees F.
	Sediment/Turbidity	<12% fines (<0.85 mm) in gravel, turbidity low, or cobble embeddedness <35%.	12–17% fines (<0.85 mm) in gravel	>17% fines (<0.85 mm) in gravel, turbidity high, or cobble embeddedness >35%.
	Chemical Contamination/Nutrients	Low levels of chemical contaminants from agricultural, industrial, and other sources, no excess nutrients, no CWA 303d-designated reaches.		Moderate levels of chemical contamination from agricultural, industrial, and other sources, any level of excess nutrients, one or more CWA 303d–designated reaches.
Habitat Access	Physical Barriers	Any man-made barriers present in watershed allow upstream and downstream fish passage at all flows of age 1+ salmonids		Any man-made barriers present in watershed do not allow upstream and/or downstream fish passage at a range of flows of age 1+ salmonids
Habitat Elements	Substrate	Dominant substrate is gravel or cobble (interstitial spaces clear), embeddedness <20%	Gravel and/or cobble is subdominant, or, if dominant, embeddedness between 20–35%	Bedrock, sand, silt, or small gravel dominant, or if gravel and cobble dominant, embeddedness >35%
	Large Woody Debris	>60 pieces/mile, >24 inches in diameter, and >50 feet long. Adequate sources of future LWD to maintain this standard. Little evidence of stream clean out or management-related debris flows.	30–60 pieces/mile, >24 inches in diameter, and >50 feet long or lacks potential sources of LWD sufficient to maintain or achieve the fully functioning standard	<30 pieces/mile, >24 inches in diameter, and >50 feet long and lacks potential sources of LWD. Evidence of stream clean out and/or management-related debris flows
	Pool Characteristics	>30% pool habitat by area. Little reduction in pool volume due to filling by fine sediment or unsorted substrates.	>30% pool habitat by area but with obvious filling by fines or unsorted substrates or <30% pool habitat by area and little reduction in pool volume due to filling	< 30% pool habitat by area and obvious reduction in pool volume due to filling with fines and/or unsorted substrates.
	Off-Channel Habitat	Water velocity refugia present. Backwaters frequent and the resulting structural influence (LWD). Side channel connectivity maintained.		Little or no velocity refugia. Few or no backwaters; no off-channel ponds. Evidence of abandoned side channels due to past management activities.

TABLE 1-6

General Matrix of Factors and Indicators of Aquatic Health

Factors a/	**Indicators**	**Properly Functioning**	**At Risk**	**Not Properly Functioning**
	Refugia (important remnant habitat for sensitive aquatic species)	Habitat refugia exist and are adequately buffered (e.g., by intact Riparian Reserves); existing refugia are sufficient in size, number, and connectivity to maintain viable populations or subpopulations.	Habitat refugia exist but are not adequately buffered (e.g., by intact Riparian Reserves); existing refugia are insufficient in size, number, and connectivity to maintain viable populations or subpopulations.	Adequate habitat refugia do not exist.
Channel Condition and Dynamics	Width/Depth Ratio	Width/depth ratio and channel types are within historic ranges and site potential as per Rosgen typing.		Width/depth ratios and channel types are outside of historic ranges and site potentials.
	Streambank Condition	Basinwide in low-gradient reaches >90% stable; i.e., on average, less than 10% of banks are actively eroding.	Basinwide in low-gradient reaches, streambanks 80–90% stable. Active erosion limited to outcurves.	<80% of streambanks are stable. Active erosion widespread throughout basin in low-gradient reaches.
	Floodplain Connectivity	Off-channel areas are frequently hydrologically linked to main channel; overbank flows occur and maintain wetland function, riparian vegetation, and succession.		Obvious reduction in hydrologic connectivity between off-channel, wetland, floodplain, and riparian areas; wetland extent noticeably reduced and riparian vegetation/succession altered significantly.
Flow/Hydrology	Drainage Network	Little increase in drainage network due to roads		Substantial increase in drainage network density due to roads (e.g., 20–25%)
Watershed Conditions	Road Density and Location	<2 miles/square mile, with no valley bottom roads	2–3 miles/square mile, with some valley bottom roads	>3 miles/square mile and/or substantial amount of valley bottom roads
	Disturbance History	<5% equivalent clearcut acres/decade (entire watershed) with no concentration of disturbance in unstable or potentially unstable areas, and/or refugia, and/or Riparian Reserves		Riparian Reserves are fragmented, poorly connected, or provide inadequate protection of habitats and refugia for sensitive aquatic species. <80% are in late-seral condition.
	Landslide Rates	Within 20% of historic natural rates. Stream conditions not evidently altered due to management-related landslides	0	Not within 20% of historic natural rates; stream conditions obviously altered

a/ Source: Upper Middle Fork Coquille WA, BLM 1999a: Table C-3. These values are for the Western Cascades Physiographic Province but are referenced here as general indicators of watershed health that could be used in other provinces absent more watershed specific data.

1.4 ENVIRONMENTAL CONSEQUENCES AND MITIGATION

Most of the PCGP is routed on ridge tops to avoid waterbodies and other sensitive landscape features. The project's cross-country route primarily follows ridgelines as it traverses the Coast Range Province, the Klamath Province, the Western Cascades Province, and the High Cascades Province. This ridgeline alignment provides the most stable landscape position for the pipeline and minimizes the number of waterbodies and wetlands crossed as the route proceeds in a southeasterly direction from Coos Bay over these mountain ranges toward the terminus of the project near Malin, Oregon. Where Riparian Reserves could not be avoided, the project proponent has worked closely with the Forest Service to minimize effects on NFS lands. Most crossings are near or at right angles to the stream channel, thereby minimizing alterations to riparian zones, banks, and channels. Water quality Best Management Practices (BMPs) would be used throughout the construction process. Timely (within the same year as construction clearing) restoration of stream banks and channels to preconstruction condition and replanting of riparian vegetation to foster succession to conifer forest would be implemented to minimize and mitigate project effects. Most of the waterbodies that are crossed by the PCGP project on NFS lands are intermittent streams that are expected to be dry or at very low flows during the summer construction activities.

1.4.1 General Construction and Stream Crossing Methods and Effects

By their linear nature, utility corridors have unavoidable effects at the site scale where they cross Riparian Reserves. Pacific Connector would follow the Stream Crossing Risk Analysis (GeoEngineers 2013c) to identify design guidance, contingency measures, and monitoring protocols specific to each crossing/risk level. For perennial streams on NFS lands, the Forest Service's restoration plans for site-specific crossings will be the basis for Forest Service decision making. All restoration methods would be designed according to FERC's Procedures as well as according to the ACOE, Oregon Department of State Lands (ODSL), ODEQ, Forest Service, BLM, Reclamation, and Oregon Department of Fish and Wildlife (ODFW) approvals. See also section 1.3.1.1 of this assessment, which provides a summary of the GeoEngineers Risk Assessment for crossings on public lands.

As described in the Stream Crossing Risk Analysis (GeoEngineers 2013c), once the project is approved and all permits and route access authorizations obtained, a preconstruction survey would be performed at all stream crossings to confirm and clarify conditions developed in the risk analysis. This survey would be performed by a team of professionals, including agency representatives, qualified to assess terrestrial and aquatic habitat and the geotechnical and geomorphic conditions relative to pipeline construction across stream channels and ditches. Following these surveys, if significant changes occur to parameters of the risk matrix for a crossing, changes would be made to the risk level and appropriate final methods of crossing and BMPs would be determined for each stream crossing. Project construction would then move forward as described in the permit documents.

Where stream channels have flowing water, crossings would be accomplished using a dry, isolated crossing method (typically dam-and-pump) consistent with the requirements of federal, state, and local agencies with specific authority to regulate the PCGP project's waterbody crossings. In dry, isolated crossings, the stream is temporarily dammed with sandbags or other structures. Water upstream of the temporary dam is pumped around the construction area. Any water present from hyporheic flows or leakage past dams in the construction area is pumped out and into an upslope sediment detention trap that allows the water to infiltrate back into the soil rather than back into the stream channel. Waterbody crossings would be made nearly perpendicular to the axis of the waterbody channel where practicable, based on engineering and routing constraints, to minimize parallel stream alignments and multiple stream crossings. To the degree possible, TEWAs have been located outside of Riparian Reserves to minimize effects.

The project would use temporary construction bridges during all phases of construction to cross stream channels on NFS lands whether the streams are perennial or intermittent or wet or dry. These temporary bridge structures would be designed according to FERC's Wetland and Waterbody Procedures as well as according to ACOE, ODSL, ODFW, BLM, and Forest Service approvals. The temporary construction bridges would be designed to maintain unrestricted flow and to prevent soil from entering the waterbody. Soil would not be used to stabilize temporary bridges. Bridges would be designed to withstand and pass the highest flow expected to occur while the bridge is in place, and, where feasible, they would be designed to span the entire ordinary high water mark (OHWM) of the waterbody. If it is not possible for the bridge to span the OHWM, a temporary culvert or pier may be required. These culverts/piers would be installed to minimize flow restrictions that may deflect stream flow to banks to prevent streambank erosion or scour. Temporary footings or piers that could cause stream bank erosion or channel scour would be removed over the winter if so requested by the Forest Service. Bankfull conditions occur in western Oregon on average every 1.1 to 1.2 years (Castro 1997). Based on this predicted interval, stabilizing the project for winter will be based on the assumption that bankfull conditions could occur in any given winter. The temporary bridges may include:

- equipment mats and culvert(s);
- equipment mats or railroad car bridges without culverts;
- clean rock fill and culvert(s); and
- flexi-float or portable bridges.

All stream crossings on NFS lands (whether intermittent or perennial or wet or dry) would be set during clearing operations in Year One of construction as well as during mainline construction in Year Two. The exception would be the construction of crossings associated with the East Fork Cow Creek and the boring under the Pacific Crest Trail (PCT) and the associated Riparian Reserves at those locations. At those locations, clearing would occur within the same year as construction in order to reduce the impacts on water quality (East Fork Cow Creek) and recreational/visual resources (PCT users). The temporary bridges set during clearing operations would be temporarily removed after clearing is complete and would not be left in place across a waterbody over the Year One/Year Two winter unless approved by the Forest Service. During mainline construction in Year Two, the temporary bridges would be reset and would be removed as soon as possible after permanent seeding. If there would be more than one month between final cleanup and the beginning of permanent seeding and reasonable alternate access to the right-of-way is available, equipment bridges would be removed as soon as possible after final cleanup, as required by FERC Wetland and Waterbody Procedures incorporated into the POD.

Pacific Connector would not allow clearing equipment to cross waterbodies prior to bridge placement. Furthermore, where feasible, Pacific Connector's contractors would attempt to lift, span, and set the bridges from the streambanks. Where it is not feasible to install or safely set the temporary bridges from the streambanks, only the equipment necessary to install the bridge or temporary support pier would cross the waterbody. Any equipment required to enter a waterbody to set a bridge would be inspected to ensure it is clean and free of dirt or hydrocarbons. Temporary bridges that have been used on other projects or in other locations on this project would be cleaned and inspected before and after use to reduce the probability of introduction or transport of invasive aquatic or terrestrial species.

Sediment barriers would be properly installed adjacent to stream crossings and at the edges of cleared areas in Riparian Reserves immediately after clearing and prior to initial ground disturbance (i.e., grading). Sediment barriers would be properly maintained throughout construction and reinstalled as necessary (such as after backfilling of the trench) until replaced by permanent erosion controls or restoration of adjacent upland areas is complete and revegetation has stabilized the disturbed areas. The contours of the streambed and banks would be restored to preconstruction configurations (i.e., contour/elevations) to restore the physical integrity/conditions of these features. At some stream crossings, steep, eroding streambanks may need to be regraded to a stable slope (2:1 to 3:1) to ensure physical integrity. Upslope areas would be restored according to the ECRP, which was developed with input from the Forest Service. Excess material excavated to stabilize banks would be placed by agreement with the Forest Service in a stable location that would not contribute sediment to stream channels. Streambank revegetation measures are outlined in Section 10.0 of the ECRP. In all cases, effective ground cover consistent with agency requirements would be in place prior to the onset of seasonal precipitation (table 1-15 of the ECRP).

The construction corridor width would be narrowed to 75 feet at stream crossings where possible. Low-growing bank vegetation would be maintained to the extent possible.

The pipeline trench would be 4 to 5 feet wide and deep enough to insulate the pipe from channel scour and debris flows during the expected life of the project. Typically, approximately 36 inches of overburden is placed on the pipe, but site-specific conditions may require additional depth. Trench plugs would be installed on each side of the crossing to ensure that water from the channel does not enter the trench or that the trench does not drain adjacent wetlands. After the particular section of pipeline is in place and has been hydrostatically tested, the trench would be backfilled with excavated material and capped with rock and cobble of sufficient size to prevent erosion of the trench fill material. The streambed and banks and associated habitat components (e.g., LWD and boulders) would be restored to preconstruction configurations as determined by the Forest Service.

As a follow-up measure to help ensure crossing actions would not adversely affect stream bank and channel structure, Pacific Connector would monitor all stream crossings quarterly for 2 years after construction, regardless of risk. Any adverse issues concerning channel stability or habitat found during the monitoring would be remediated. Additional monitoring would occur periodically over a 10-year period, with implementation of remediation as needed (See FEIS Section 4.4.2.2, Waterbody Crossing Methods).

1.4.1.1 Application of Best Management Practices for Water Quality

BMPs are proven methods of reducing impacts on water quality that may result from a construction project. Applicability and selection of BMPs depend on the site conditions and risk of an adverse consequence. The end result of application of BMPs is moderation of the effects of an action on water quality to an acceptable level.

At the request of the U.S. Fish and Wildlife Service (USFWS) and ODEQ, Pacific Connector has completed a risk assessment for stream channel crossings and has filed that report as part of its application with FERC (GeoEngineers 2013c). The GeoEngineers' Risk Analysis provides:

- Predicted project effects on the short-term and long-term stability of the stream channel at the location of pipeline construction as well as upstream and downstream of the crossing site.
- Predicted project effects on the ecological functions and values of the streams and riparian areas being crossed by the project, particularly with respect to hydrogeomorphic and ecological connectivity.

This evaluation is presented in a two-axis matrix, with site or stream response potential on the X-axis and construction impact potential on the Y-axis (figure 1-2). Each of these two factors is evaluated individually on the X and Y axes of the risk matrix and assigned to a management category. Appropriate BMPs are assigned to each management category. Specific results of the analysis are provided in each of the watershed discussions in Section 2 of this report. The database and information used to support this analysis are provided in GeoEngineers' Stream Crossing Risk Analysis filed by Pacific Connector as part of the 2017 FERC application, as amended by supplemental filings.

Figure 1-2 Matrix for Evaluation of Construction Impact and Site Response Potential

<table>
<tr><td rowspan="4">Project Impact Potential</td><td>H</td><td colspan="2">Green Management Category:

Pacific Connector Project Typical Construction with habitat enhancement BMPs</td><td>Red Management Category:

Site-Specific Design (in consultation with agency representatives)</td></tr>
<tr><td>M

L</td><td>Blue Management Category:

Pacific Connector Project Typical Construction (in consultation with agency representatives)</td><td>Yellow Management Category:

Pacific Connector Project Typical Construction with BMPs for sensitive bed, bank, or riparian revegetation conditions to be selected by Environmental Inspector (in consultation with agency representatives) during construction.</td><td>Orange Management Category:

Pacific Connector Project Typical Construction with BMPs for sensitive bed, bank, or riparian revegetation conditions selected by qualified professional prior to construction-based site-specific information from preconstruction evaluation (in consultation with agency representatives).</td></tr>
<tr><td></td><td>L</td><td>M</td><td>H</td></tr>
<tr><td colspan="4">Site Response Potential</td></tr>
</table>

Note: At the request of ODFW and ODEQ, this table was developed by Pacific Connector to provide a framework to segregate stream crossings into different management prescriptions based on the potential site response (the X axis) and potential construction impacts (the Y axis). On NFS lands, 30 stream crossings are in the blue, or low risk, management category; 8 are in the yellow, or moderate risk, management category; and 3 are in the green category and have high risk to valuable aquatic habitats. Application of BMPs is tailored to the risk predicted for the site. During preconstruction inspections, applicable BMPs would be described as needed by the FERC Environmental Inspector and agency representatives to protect water quality and restore aquatic habitats after construction.

The "X" axis of the matrix addresses potential impacts related to channel stability. The four attributes on which the "X" axis is scored are:

- Channel Slope or Stream Type: Higher gradient slopes—often associated with bedrock or coarse colluvial material in the streambed or banks—represent relatively low risk, while low-gradient channels that are prone to depositional instability, lateral migration, or avulsion (as on an alluvial fan) are associated with high risk. Incised channels are also associated with high relative risk.

- Riparian Corridor: Wide or unconfined riparian corridors represent relatively low-risk and confined or infrastructure-constrained (e.g., with roads, levees) riparian corridors represent high risk.
- Bank Characteristics: Bedrock represents a low-risk bank. Risk increases with more erodible banks, but the degree of erodibility is left open to consider the interactions of bank soil grain size, bank stratigraphy and consolidation/cementation, bank angle, and bank vegetation.
- Bed Materials: This attribute is directly related to the ease of erosion and is arranged in risk order from low (bedrock) to high (sand). Risk order for granular materials is based on erosion thresholds rather than strictly on grain size. Due to cohesion, a clay- or silt-bedded stream is less erodible than a sand-bedded stream.

The “Y” axis of the matrix addresses potential impacts to riparian structure and function. The four attributes on which this “Y” axis is scored are:

- Artificial Bed/Bank Stabilization: A low risk designation is given to locations where existing bed or bank hardening is removed, allowing greater expression of normative geomorphic processes. The high risk designation is given to locations where rigid (i.e., non-deformable) bed or bank stabilization must be used to stabilize the channel to prevent post-construction instability as evaluated by the “X” axis of the risk matrix. Non-deformable stabilization includes any structures that are designed to maintain the location or grade of the channel margin in the face of extreme flood events.
- Construction Methods/Duration: Based on the intensity of surface disturbance, low risk is allocated to trenchless techniques or simple excavated crossings of low-gradient streams while higher risk is associated with locations requiring blasting or other means of invasive rock fracturing. Typical pipeline construction techniques score on the low to moderate part of this axis.
- Channel Disturbance Width: This attribute is based on the assumption that variations in channel geometry, such as pools and riffles, are an indication of high-quality aquatic habitat. Because these morphologic variations typically occur on longitudinal dimensions proportional to channel width, fixed-width construction activities that disrupt a narrower channel could potentially disturb more distinct aquatic habitat units than construction activities that disrupt a wider channel. Therefore, headwater streams would score high on this attribute.
- Floodplain Disturbance Width: This attribute assumes that perpendicular crossings of the stream would be associated with reduced loss of riparian and floodplain habitat because a relatively small proportion of the floodplain is disturbed in the down-valley direction, while alignments that parallel rivers are considered to more readily alter patterns of down-valley riparian values.

Blue Management Category

Waterbody crossings in the blue management category have low or moderate scores for all eight risk factors. Construction and site restoration would follow the methods and typical drawings shown in appendix 1b of the ECRP. Post-construction site restoration would use BMPs such as seeding, planting, and hydromulch or erosion control blankets to minimize surface erosion while new vegetation becomes established. Typical site revegetation and backfill would be used to address habitat issues at these sites. The “project typical" BMPs used for waterbody crossings in this and the other four management categories are summarized in table 1-7. Stream crossings in the blue category are found in table 1-8.

TABLE 1-7

Best Management Practices Common to All Crossings and to the Blue Category

Crossing Component	Best Management Practices and Source
Streambed	• Dry ditch crossings (5) • Backfill with native material (3, 4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1)
Streambanks	• Typical erosion and sediment control BMPs, including mulch, hydromulch, placement of coarse woody debris for surface projection, seeding and fertilizing, erosion control blankets, silt fences. • Narrowed construction disturbance (75 feet) corridor where feasible (2, 3, 4) • Narrowed permanent management corridor (2, 3, 4) • Aggressive revegetation with native plant materials (3, 4, 6)
Riparian Vegetation	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees, widened riparian corridor (federal lands, willing landowners) (3, 6) • Use of fast-growing native tree species to accelerate shading (3)
Aquatic Habitat	• Stratified backfill for fish-bearing streams (1, 2, 4, 6) • Placement of large wood where appropriate (2, 4, 6)
BMP Sources	1. FERC Guidelines 2. FEIS, Chapter 2 Project Description 3. POD attachment, Erosion Control and Revegetation Plan 4. POD attachment, Wetland and Water Body Crossing Plan 5. POD attachment ROW Clearing Plan 6. POD attachment, Compensatory Mitigation Plan Agency representatives of the Forest Service may require additional measures necessary to meet agency standards under the terms of the Right-of-Way Grant.

TABLE 1-8

Stream Channel Crossings, Blue Category

Fifth Field Watershed	**Sixth Field Subwatershed**	**MP**	**Type a/**	**Description a/**	**Bankfull Width (ft) b/**	**Width of Crossing (ft) a/**	**Channel Gradient (%) b/**	**Channel Incision (ft) b/**	**Bank Character b/**	**Streambed Material b/**	**Turbidity Rating c/**	**Site Response Rating d/**	**Construction Impact Rating d/**	**Overall Rating e/**
Upper Cow Creek	SF Cow Cr.	111.01	I/P	Perennial stream with summer flow diversion. , drainage, U-shaped, cobble 1-2' wide		16.41					I	I	I	BLUE
Little Butte Creek	Salt Cr.	141.17	I	1-2' wide intermittent stream with little vegetation		2.51					I	I	I	BLUE
Little Butte Creek	Salt Cr.	141.44	I	3-4' average width, U-shaped channel, 8%gradient	4	43.2	13.89		Highly erosion-resistant	bedrock	L	L	L	BLUE
Little Butte Creek	Salt Cr.	141.49	I	1-2' wide intermittent drainage		4.45					L	I	I	BLUE
Little Butte Creek	Beaver Dam Cr.	166.21	I	Daley Creek. 30-40' wide braided channel, cobble/gravel substrate,		26.51					I	I	I	BLUE
Spencer Creek	Buck Lake	171.06	I	Small, 10' wide stream associated with wetland swale	12	154.82	3.3	0.75	Erodible	silt	M	L	M	BLUE

TABLE 1-8

Stream Channel Crossings, Blue Category

Fifth Field Watershed	**Sixth Field Subwatershed**	**MP**	**Type a/**	**Description a/**	**Bankfull Width (ft) b/**	**Width of Crossing (ft) a/**	**Channel Gradient (%) b/**	**Channel Incision (ft) b/**	**Bank Character b/**	**Streambed Material b/**	**Turbidity Rating c/**	**Site Response Rating d/**	**Construction Impact Rating d/**	**Overall Rating e/**
Spencer Creek	Buck Lake	171.57	P	2' wide stream that fans out into a wetland/stream complex		4.05					L	I	I	BLUE
Spencer Creek	Buck Lake	172.48	I	Wetland/Stream	5	64.25	1.98		Highly erosion-resistant	gravel	M	L	M	BLUE
Spencer Creek	Upper Spencer Cr.	173.74	I	4' wide, snowmelt Intermittent stream		8.17					I	I	I	BLUE
Spencer Creek	Upper Spencer Cr.	174.0	I	1-2' wide, snowmelt intermittent stream	3	3.02	5.3		Highly erosion-resistant	gravel/ soil	L	L	L	BLUE
Spencer Creek	Upper Spencer Cr.	176.55	I	1' wide intermittent shrubbed stream Extension of ESI069' - wide, 2' deep	4	2.02	57.99		Erodible	gravel/ soil	M	L	M	BLUE

Sources

a/ Table 2A-3a, Resource Report 2, Water Use and Quality, PCGP 2017

b/ Table A-2, Stream Crossing Risk Analysis, GeoEngineers 2011

c/ Table B-1, Turbidity, Nutrients and Water Quality Analysis, GeoEngineers 2011

d/ Table A-1, Stream Crossing Risk Analysis, GeoEngineers 2011

e/ Figure 4, Stream Crossing Risk Analysis, GeoEngineers 2011

Yellow and Orange Management Categories

Sites in the yellow management category represent moderate risk for stream channel stability based on the risk assessment scoring. This scoring typically requires at least one high-risk channel attribute and the remaining attributes to be at least moderate. These channels occur at all points in the watershed. More robust BMPs, particularly for streambanks and streambeds, would be used in addition to those included in the "Project Typical" set of BMPs, as described in table 1-9. Specific BMPs would be selected by the Environmental Inspector or suitably trained professionals in consultation with agency representatives prior to construction.

Sites in the orange management category represent the highest potential risk for short- and long-term channel stability. This scoring typically requires more than one high-risk (score of 4 or 5) channel attribute and that the remaining attributes be at least moderate.

Channel conditions that have placed streams in the yellow or orange management categories include:

- Channel Incision: Incised channels represent the greatest risk observed on the Pacific Connector alignment because they are likely to result in continued bank erosion as channel banks evolve into a more stable configuration. For those incised channels that are not already eroded down to bedrock, additional scour is also possible, depending on whether downstream grade control is present in close proximity to the crossing site. Channel banks would require the incorporation of deformable stabilization during site restoration.
- Channel Slope: Streams at lower and moderate slopes are more prone to channel migration, and streams on moderate slopes are also prone to channel scour. Channel migration and scour risk were assessed for the named waterbodies (GeoEngineers 2007) and are accounted for in locating the pipe overbend and burial depths. Streams with very high channel slopes (>20%) require selective placement of coarse materials available from the pipeline trench to provide additional grade control.
- Riparian Condition: More robust woody vegetation in the riparian zone typically reduces avulsion risk and aids in reducing erosion of stream banks. Revegetation to maintain the continuity of the existing riparian zone is appropriate for these streams.

Channel Bed and Bank Materials: Erodible materials in the bed or bank present a greater short-term risk of scour or lateral migration than do non-erodible materials. Erodible banks are more likely to require the addition of deformable bank or bank toe stabilization. Channel scour is addressed by selection of the pipe burial depth and by the selective placement of available coarse materials in the backfill. Stream crossings in the yellow and orange categories on NFS lands are shown in table 1-9.

TABLE 1-9

Best Management Practices for Crossings in the Yellow and Orange Categories

Crossing Component	**Best Management Practices and Source** (These would be selected as needed by the FERC Environmental Inspector after a preconstruction evaluation with agency representatives.)
Streambed	• Dry ditch crossings (5) • Backfill with native material (3, 4) • Backfill to match existing streambed gradation, composition as much as possible (4); profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1) • Structural fill placement (2)
Streambanks	• Typical erosion and sediment control BMPs including erosion control blankets, silt fence, etc. • Narrowed construction disturbance (75') corridor where feasible (2, 3, 4) • Narrowed permanent management corridor (2, 3, 4) • Revegetation with native plant materials (3, 4, 6) • Bank graded/terraced to 3:1 (2, 3) • Geotextile reinforced slope (5) • Fiber rolls (3) • Stream barbs/flow deflectors (5) • Toe rock placement (3) • Riprap placement (3) • Biotechnical “vegetation” riprap (3) • Tree revetments (3)
Riparian Vegetation	• Revegetation with native trees to within 15' of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (federal lands (3, 6) • Use of fast growing native tree species to accelerate shading (3)
Aquatic Habitat	• Stratified backfill for fish-bearing streams (1, 2, 4, 6) • Placement of large wood where appropriate (2, 4, 6)
BMP Source	11. FERC Guidelines 2. FEIS, Chapter 2 Project Description 3. POD attachment, Erosion Control and Revegetation Plan 4. POD attachment, Wetland and Water Body Crossing Plan 5. POD attachment ROW Clearing Plan 6. POD attachment, Compensatory Mitigation Plan Agency representatives of the Forest Service may require additional measures necessary to meet agency standards under the terms of the Right-of-Way Grant.

TABLE 1-10

Stream Crossings in the Yellow Category

Fifth-Field Water-shed	**Sixth-Field Subwatershed**	**MP**	**Type a/**	**Description a/**	**Bankfull Width (ft) b/**	**Width of Crossing (ft) a/**	**Channel Gradient (%) b/**	**Channel Incision (ft) b/**	**Bank Character b/**	**Stream-bed Material b/**	**Turbidity Rating c/**	**Site Response Rating d/**	**Construction Impact Rating d/**	**Overall Rating e/**
Upper Cow Creek	SF Cow Cr.	109.17	P	HF-C perennial stream with associated seep wetland with shrubs	5	12.02	18.6		erodible	sand	M	M	M	YELLOW
Upper Cow Creek	SF Cow Cr.	109.33	I	HF-F 3' wide intermittent		7.54					M	M	M	YELLOW
Little Butte Creek	Lick Cr.	140.26	I	Lick Creek, 10-20' wide, U-shaped channel		12.33					M	M	M	YELLOW
Little Butte Creek	Upper SF Little Butte Cr.	162.45	P	U-shaped, 1% gradient	22	19.62	0.87		erosion resistant	gravel/ cobble	M	M	M	YELLOW

Sources

a/ Table 2A-3a, Resource Report 2, Water Use and Quality, PCGP 2017

b/ Table A-2, Stream Crossing Risk Analysis, GeoEngineers 2011

c/ Table B-1, Turbidity, Nutrients and Water Quality Analysis, GeoEngineers 2011

d/ Table A-1, Stream Crossing Risk Analysis, GeoEngineers 2011

e/ Figure 4, Stream Crossing Risk Analysis, GeoEngineers 2011

Green Management Category

Streams in the green management category represent higher risks for stream channel stability based on the risk assessment scoring. for sites with high habitat impact potential would use typical site construction methods. In addition to the BMPs, emphasis would be placed on the habitat restoration measures described below. Channels placed in this field typically are those that disturb a greater proportion of the existing floodplain or—in narrower streams—potentially disturb more varied aquatic habitat. During site restoration, however, particular effort would be made on using BMPs for opportunistic habitat enhancement, as detailed from observations obtained during the preconstruction survey. These BMPs could include riparian planting to improve existing habitat conditions in the floodplain, placement of large wood or rock to improve instream habitat, or modification of existing riprap to improve habitat. Where these channels require the addition of deformable bank stabilization, maximum use would be made of BMPs that promote bank revegetation with woody materials. In addition to the "Project Typical" BMPs, Pacific Connector would propose additional BMPs for use at crossings in this management category, as shown in Table 1-11.

TABLE 1-11

Best Management Practices for Crossings in the Green Category

Crossing Component	**Best Management Practices and Source**
Streambed	• Dry ditch crossings (5) • Backfill with native material (3, 4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1)
Streambanks	• Typical erosion and sediment control BMPs, including erosion control blankets, silt fences, etc. • Narrowed construction disturbance (75') corridor where feasible (2, 3, 4) • Narrowed permanent management corridor (2, 3, 4) • Revegetation with native plant materials (3, 4, 6) **Additional Measures** • Rootwad enhancement of bank stabilization
Riparian Vegetation	• Revegetation with native trees to within 15' of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees for willing landowners (3) • Widened riparian corridor (federal lands, willing landowners) (3, 6) • Use of fast growing native tree species to accelerate shading (3) **Additional Measures** • Emphasis on prevention and monitoring for invasive weeds and weed control during revegetation establishment.
Aquatic Habitat	• Stratified backfill for fish-bearing streams (1, 2, 4, 6) • Placement of large wood where appropriate (2, 4, 6) **Additional Measures** • Rootwad enhancement of bank stabilization
BMP Sources	1. FERC Guidelines 2. FEIS, Chapter 2 Project Description 3. POD attachment, Erosion Control and Revegetation Plan 4. POD attachment, Wetland and Water Body Crossing Plan 5. POD attachment ROW Clearing Plan 6. POD attachment, Compensatory Mitigation Plan Agency representatives of the Forest Service may require additional measures necessary to meet agency standards under the terms of the Right-of-Way Grant.

BMPs to address specific components of waterbody crossings at sensitive crossing locations (i.e., with high impact potential and moderate or high site or stream response potential) are summarized in table 1-12. Stream crossings in the green category are listed table 1-12. Specific BMPs would be selected by the Environmental Inspector or suitably trained professionals prior to construction.

TABLE 1-12

Stream Crossings in the Green Category

Fifth Field Watershed	Sixth Field Subwatershed	MP	Type a/	Description a/	Bankfull Width (ft) b/	Width of Crossing (ft) a/	Channel Gradient (%)b/	Channel Incision (ft) b/	Bank Character b/	Stream-bed Material b/	Turbidity Rating c/	Site Response Rating d/	Construction Impact Rating d/	Overall Rating e/
Upper Cow Creek	SF Cow Cr.	109.47	P	HF-G EF Cow Creek – 28' wide, broad, cobbles, boulders, 2' wide	12	26.44	3.32	3.5	erosion resistant	cobble and boulders	M	M	H	GREEN

Sources

a/ Table 2A-3a, Resource Report 2, Water Use and Quality, PCGP 2017

b/ Table A-2, Stream Crossing Risk Analysis, GeoEngineers 2011

c/ Table B-1, Turbidity, Nutrients and Water Quality Analysis, GeoEngineers 2011

d/ Table A-1, Stream Crossing Risk Analysis, GeoEngineers 2011

e/ Figure 4, Stream Crossing Risk Analysis, GeoEngineers 2011

Red Management Category

No channels were found to score in the red management category on NFS lands presenting both a high risk of stream response and habitat impact under the range of construction methods and BMPs proposed for the Pacific Connector project. Streams in this category would require site-specific design and specifications such as those required by FERC (2003) for major waterbodies (>100-foot crossing widths) prior to construction. Following the preconstruction survey, a site-specific design would be developed and incorporated into project construction plans if more detailed information results in the reclassification of a site into this field (for example, due to the necessity of adding nondeformable bank stabilization).

Pre-Construction Survey

Forest Service personnel have reviewed stream inventory data and have field-verified all perennial and most intermittent crossings. It is possible, however, for conditions to change between the time of inventory and the time of construction. In order to ensure that prescriptions are still appropriate for the conditions at each crossing, a review of all crossings on NFS lands would be completed by Forest Service representatives prior to construction. At sites where conditions have changed significantly from those described in the 2017 Pacific Connector application (PCGP Wetland Delineation Report 2017, GeoEngineers 2018), the preconstruction survey would reevaluate whether the management category for these sites should be modified. Channel information to be verified during the preconstruction survey at the higher risk habitat sites (green management category) would include channel configuration/morphology, size and distribution of instream structure that affects the in-channel distribution of hydraulic energy (e.g., logs and large rock), substrate grain size and thickness of the active channel substrate, and bank geometry and material configuration. Appropriate permitting entities would be notified of changes in management approach and the rationale for such changes; with respect to habitat conditions, the preconstruction survey would document the type and frequency of individual aquatic habitat units and specific information on current riparian vegetation. As provided by the Right-of-Way Grant, agency representatives would be engaged and consulted during the survey and may require additional measures necessary to accomplish ACS objectives.

1.4.1.2 Water Quality—Sediment

Short-Term Sediment Related to Construction of Stream Crossings

Because of their linear nature, natural gas and oil transmission pipelines must traverse streams, rivers, and other water bodies. The PCGP would cross perennial streams that have flowing water year-round and intermittent streams that typically stop flowing during dry summer months and may or may not have flowing water at the time of construction. Watercourse crossing construction can increase downstream suspended sediment concentrations through trench excavation (trenching), backfilling the storage of excavated material directly in the watercourse, the installation of isolation and diversion structures, erosion and runoff from adjacent upland worksites, and the discharge of water from hydrostatic pipe testing or trench dewatering (Reid and Anderson 1999, Reid et al. 2004). Amounts and concentrations of sediments depend on the nature of the soil and streambed materials (gravel, silt, etc.) at the crossing site, streamflow, construction methods, and other variables (Levesque and Dube 2007).

All PCGP project stream crossings on NFS lands with flowing water at the time of construction (except the perennial stream in the general vicinity of the PCT crossing) would be accomplished using the dry dam-and-pump method (figures 1-3, 1-4, 1-5). A conventional bore would be used for the perennial stream in the general vicinity of the PCT crossing. For all others, the dry dam-and-pump method maintains downstream flow while isolating the construction area between upstream and downstream dams from flowing water by pumping the water around the construction area. Dry dam-and-pump stream crossings typical of landscapes on NFS lands would likely take from 1 to 5 days to complete, although construction periods can vary significantly depending on topography and flows. It is anticipated that many smaller stream channels on NFS lands can be crossed in less than 48 hours. On larger flowing streams, flumes may be added to the process if necessary to move water past the crossing or to maintain passage for aquatic biota (figure 1-5).

The objective of the dry dam-and-pump method is to isolate the construction crossing from waters in the stream being crossed to minimize the release of sediment. Sediment effects from isolated dry crossings are generally short term and are associated with:

1. installation and removal of the upstream and downstream dams (figure 1-3);
2. water leaking through the upstream dam into the work area;
3. movement of instream rocks and boulders to allow proper pipeline alignment and installation of the dams; and
4. return of streamflow to the construction work area after the crossing is complete and the dams are removed.

Figure 1-3 Installation of a Dam in a Dry Open-cut Crossing of a Small Channel

Figure 1-4 Preparation of Perennial Stream Crossing with Equipment Bridges and Sediment Fence Installed

Figure 1-5 Dam-and-Pump Crossing of Perennial Stream with Flume

Background Sediment Concentrations

Background sediment concentrations and range of variation from disturbance provide a baseline for considering potential effects of the project. Project-generated sediment added to background levels provides an estimate of the total sediment concentration associated with project construction. These total sediment amounts can be compared to historical ranges of sediment concentrations to provide a framework to evaluate the effects of the PCGP related to ACS objectives.

Sediment amounts in Pacific Northwest streams vary by orders of magnitude with flows, precipitation, stream position in the watershed, disturbance events, watershed conditions, and many other variables. Episodic high-intensity storms may generate the majority of the sediment transported for the entire year while suspended sediments during summer months generally remain low in the absence of disturbance events. For example, a review of 6 months of USGS gage data in Cow Creek prior to the construction of Galesville Dam showed that 95% of the sediment transport for the reporting period occurred in one 3-day storm. Sediment concentrations reached nearly 1,000 milligrams per liter (mg/L) during this 3-day event but averaged 3.5 mg/L for the rest of the year (Curtis 1982). USGS gage data from watersheds crossed by the project for dates that overlap the ODFW instream work window ranged from 1–13 mg/L and averaged 3.4 mg/L (USGS 2013). Historical USGS gage data (1950–1979) for the Klamath River, which is part of the Klamath Siskiyou physiographic province[5] south of the project area, range from less than 5 mg/L during low summer flows to over 5,000 mg/L during winter high flows, although sediment concentrations greater than 1,000 mg/L have been recorded during summer months (Bureau of Reclamation 2012. VII: C16).

Stand-replacing fire and high-intensity rainstorms are the primary historical disturbance factors that mobilize sediment in Pacific Northwest watersheds (see section 2.1). Changes in sediment concentrations following a fire vary with fire intensity, rainfall intensity, topography, remaining duff layer, soil type, and many other factors. There are many anecdotal records of flow and sediment increases following fires, but pre- and post-fire measurements that quantify such events are rare because of the stochastic nature of stand-replacing fire and watersheds with instrumentation are only rarely involved in high-intensity fire. Where pre- and post-fire surveys have been completed, high-intensity fire has generally resulted in a substantial increase in sediment transport and deposition in streams.

- The accelerated erosion associated with intense fire combined with normal background levels may cause a five-fold increase in sediment yield in Douglas-fir and western hemlock forests (Swanson 1981, cited in Catching Beaver WA).
- When site disturbances such as severe fire produce hydrologic conditions that are poor (less than 10% of the ground surface covered with plants and litter), surface runoff can increase by more than 70% and erosion can increase by three orders of magnitude (Robichaud et al. 2000).

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[5] Portions of the Coquille, Umpqua, Rogue River, and Klamath basins are in the Klamath-Siskiyou geologic province and have similar geology, soils, and weather patterns and likely have similar sediment responses to storms.

- A study in New Mexico showed a stand-replacing fire in a pine and mixed-conifer forest resulted in flow and sediment concentration increases of two orders of magnitude over pre-fire conditions, with most of the fine sediment transport occurring in the first 2 years following the fire (Malmon et al. 2007). Timing of precipitation can mitigate these effects in some circumstances. Post-fire measurements in Glacier National Park in the northern Rocky Mountains showed little increase in sediment concentrations when snow fell on the fire area early in the winter, buffering it from high-intensity rainfall events. This is consistent with observations of Pettigrew et al. (2006) in central British Columbia, suggesting that increases in sediment transport following wildfires is transport-limited, not supply-limited.

- In Wyoming, three stations on the Little Granite Creek watershed of the Gros Ventre range near Bondurant were monitored in 2002 and 2003 following a large fire in 2000 that burned most of the Boulder Creek subwatershed. The primary sources of sediment in the watershed are mass wasting, including active earthflows from unstable hill slopes, and slumping from undercut terraces and road cuts. Estimates of peak concentrations during the first post-fire year (2001) ranged from 300 to 1,200 mg/L and 350 to 5,700 mg/L at two different measuring stations during the snowmelt period. During baseflow periods in 2003, suspended sediment concentrations ranged from 2 to 7 mg/L at the upper site and 0.2 to 10 mg/L at the lower site. During a summer thunderstorm, sediment concentrations peaked at 200 mg/L (Ryan et al. 2006).

- In northern California, high-intensity rainfall following a high-intensity fire in 2012 showed a five-fold increase in turbidity (and, by inference, sediment concentrations) in the McCloud River. The Forest Service estimates the rain events following the fire mobilized 4.5 million cubic yards of sediment (Shasta-Trinity National Forest 2014).

- Monitoring efforts intended to determine the success of implementing the ACS throughout the area of the NWFP showed that in watersheds subjected to large wildfires, conditions had declined during the first 10 years following implementation of the ACS. The largest declines included watersheds where wildfires burned 30 to 60% of their area (Reeves et al. 2009).

For most of the Klamath-Siskiyou and Western Cascades provinces, high-intensity winter rainfall events have had the most impact on erosional processes. In the High Cascades province, most precipitation falls as snow. In these areas, geologically recent volcanic deposits may be less impacted by rainfall but are subject to mass wasting when saturated by snowmelt.

From this review of data and literature, the following are basic conclusions concerning background sediment concentrations:

- Sediment in Pacific Northwest stream systems is delivered in pulses associated with disturbance events. High-intensity fire followed by high-intensity rainfall can mobilize huge pulses of sediments. Typically, these occur in winter storms, but may occur as snowmelt runoff at higher elevations with the onset of seasonal precipitation in the fall and in summer thunderstorms. These events are infrequent.

- Based on USGS gage data, sediment concentrations in high-flow winter events may reach 1,000 to 5,000 mg/L and remain at high levels for days during and following large storms.
- Based on limited USGS gage data, sediment concentrations in summer base flows in watersheds crossed by the project typically range from 1 to 13 mg/L. Based on these data, sediment concentrations would be expected to range from 0 to 4 mg/L in small mountain streams with gravel substrates. Valley bottom streams with silt and sand substrates would be expected to range from 2 to 7 mg/L. Streams in which ongoing irrigation activities occur may consistently run above these natural ranges, which is consistent with literature citations for the Klamath Basin (Bureau of Reclamation 2012).
- Summer thunderstorms following a stand-replacing fire can cause short-term spikes in sediment concentrations that may increase over ambient sediment concentrations by orders of magnitude. No local data are available. Levels of 200 mg/L have been documented in Wyoming during a summer thunderstorm. USGS gage data showed a sediment concentration spike of 1,000 mg/L in the Klamath River in August, but causality is unknown.

Increases in Sediment Associated with Pipeline Crossing Construction

Measurement of sediment can be expressed many different ways. For example, a 5-gallon bucket of silt could generate suspended sediment concentrations in the thousands of mg/L at the point of origin and remain suspended in the water column for long distances. Without some estimate of the volume of sediment (5 gallons), the concentration (thousands of mg/L) would not provide a meaningful measure of watershed effects. Duration of exposure is also important to aquatic biota. Several days of chronic exposure to lower concentrations of sediment can be much more impacting to aquatic biota than a single high spike in sediment concentration. In this assessment, the scale (where and how far), the duration (how long), and the magnitude (how much, expressed both as concentration and estimated volume) are used to provide an assessment of effects on aquatic biota. Precise predictions are impossible to make because of background variables and site conditions, so, where appropriate, an expected range of values is used to describe project effects.

Several studies concerning construction of buried pipeline stream crossings have evaluated sediment increases associated with dam-and-pump isolated construction methods.[6] Levesque and Dube (2006) reviewed and summarized the effects of various crossing construction methods, noting that pipeline-crossing construction may have detrimental effects on aquatic ecosystems. Reid and Anderson (2002) studied sediment transport at eight dam-and-pump crossings with measurable flow in northern Alberta, Canada, in winter 1999/2000. Habitat alteration (i.e., sediment deposition) was studied at three of these crossings. Between 1 and 9 days were required for instream construction. All but one had flow of 0.1 cubic meters per second (m^3/sec) or less. Samples were collected across the duration of construction. Background sediment concentrations ranged from 2.4 to 14.6 mg/L. Results showed that the dry dam-and-pump technique was very

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[6] The studies cited here are from eastern Canada and the eastern U.S., since that is where most pipeline construction has occurred; these studies provide the best available evidence of possible increases in sediment concentrations. While these may be different environments than for the PCGP, the entrainment, transport, and deposition of sediment are physical processes dependent on flows, sediment texture, etc., not the location of the study. Stream crossings on the PCGP range from silty clays to gravels. By representing a range of likely outcomes, we account for possible differences in background conditions.

effective in limiting sediment release in these small watercourses. Mean sediment concentration increase above background was 8.3 mg/L and median concentration above background[7] was 7.5 mg/L. Increases in downstream concentrations were generally limited to installation and removal of the dams and bypass pumps. Concentrations above background were generally greater during dam-and-pump removal (1.0 to 703 mg/L) than during installation (average less than 76 mg/L over background). The duration of effects during installation and removal of dams and pumps ranged from 20 minutes to 6.5 hours. During other phases of construction (trenching and backfilling), increases above background were generally less than 8 mg/L (Reid and Anderson 2002: 738). Sediment was more evident at crossing sites, with bed and bank materials consisting of fine-grained sediments. No impacts to downstream habitat due to sedimentation were found, and there was no evident pattern related to watercourse size or flow.

In another evaluation, Reid et al. (2002) conducted suspended sediment sampling during dry dam-and-pump crossings of four brook trout streams in Nova Scotia and Ontario, Canada (watered widths ranging from 1.1 to 3.6 meters (m)). Samples were collected at downstream distances ranging from 13 to 30 m. Instream work ranged from 16 hours to 41 hours spread over 2 to 6 days. During periods of increased sediment loading, samples were collected every 30 minutes and less frequently during periods of no instream construction. Sampling continued after completion of construction until downstream turbidity levels returned to background (typically less than 2.5 hours). Background (upstream) sediment concentrations ranged from <2 to 4 mg/L. Mean increases above background ranged from 4 to 20 mg/L for dam-and-pump crossings. Spikes in sediment concentration in association with dam-and-pump installation and removal ranged from 61 to 1,032 mg/L. These spikes were short term, with downstream sediment concentrations returning to the background level within 10 hours. This study found little evidence for downstream deposition of fine sediment or habitat alteration by sediment deposition. Reid et al. (2004) reviewed a number of studies and reported similar findings, noting that 90% of dam-and-pump crossings showed increases in sediment concentrations above background of less than 25 mg/L. In contrast, wet open-cut crossings where water was not diverted had sediment increases 20 times that of isolated dam-and-pump crossings.

Distance transported and concentration of sediment transported downstream in suspension are highly variable and depend on the particle size (e.g., silt vs. sand, etc.), stream volume, stream velocity, and other variables. Reid et al. (2002) measured sediment deposition 20 and 115 meters downstream of dam-and-pump pipeline crossings and found surficial streambed material was generally unaffected, noting that a thin veneer of fine sediment was temporary and was resuspended within fewer than 3 days.

Pacific Connector calculated watershed-specific projected sediment concentrations for dry dam-and-pump crossings at the construction site and at 10 meters, 50 meters, and 100 meters downstream. Estimated total suspended solid (TSS) concentrations downstream from flumed dry

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[7] Most of the available literature on this topic report measurements of sediment concentrations expressed as mg/L of sediment. Turbidity is also used to measure suspended sediments. Turbidity is a measurement of the decrease in transparency of stream water as light is scattered by suspended particulate matter, generally expressed as nephelometric turbidity units (NTU). Relationships between turbidity and sediment concentrations are complex and vary with instrumentation and the nature of the sediment in suspension and generally need to be calibrated onsite to provide consistent measurement of sediment concentrations. In this review, sediment concentration rather than turbidity is used for comparison of effects.

open-cut construction ranged from less than 94 mg/L to 2 mg/L (see 2017 PCGP Resource Report 3, table 3.2-25). Estimated TSS concentrations downstream from dam-and-pump dry open-cut construction range from about 23 mg/L to 2 mg/L (see 2017 PCGP Resource Report, Table 3.2-25). Predicted sediment concentrations calculated by Pacific Connector are consistent with empirical data from studies of pipeline crossings using dam-and-pump crossing methods by Reid and Anderson (2002), Reid et al. (2002), and Reid et al. (2004).

Culvert removals are a routine management activity on federal lands and provide a familiar comparison of relative effects. In a study of culvert removals in Idaho and Washington, sediment concentrations were monitored at 11 stream crossings in three areas to measure the sediment concentrations associated with culvert removal (Foltz et al. 2008). Flow rates at two areas (Horse Creek and Wendover Creek) were low (0.1 to 0.6 liter/second (L/s)) and were higher (9-13 L/s) at the third (Granite Creek). In one area (Wendover Creek), the five culverts removed and monitored were log-constructed and old. Mitigation measures, including diverting the stream channel around the work area and installation of straw bales downstream of the crossings, were implemented at four Wendover Creek stations, but not at the others. At one of the Horse Creek stations, culvert removal occurred during several storm events. Peak sediment concentrations at unmitigated removals ranged from 2,060 mg/L to 28,400 mg/L with a mean of 13,000 mg/L. Sediment yields ranged from 3 kilograms (kg) (7 pounds) to 170 kg (375 pounds), with a mean of 67 kg (148 pounds). At the four locations on Wendover Creek where mitigation was applied (diversion and straw bales), peak sediment concentrations were between 300 mg/L and 1,300 mg/L, with a mean of 830 mg/L. Sediment yields ranged from 0.2 kg (1/2 pound) to 3 kg (7 pounds), with a mean of 1.6 kg (4 pounds). At the three locations on Horse Creek with monitoring stations 100 m downstream, concentrations were an order of magnitude lower than at the culvert outlet, and, at 810 m downstream, there was very little increase above ambient levels (10 mg/L) for the two locations not influenced by storms. At three of 10 locations (including the storm-influenced location), suspended sediments exceeded 6,000 mg/L for more than 1 hour, and, at five locations, sediment concentrations exceeded 500 mg/L for 10 hours. These sediment concentrations are significantly higher than those predicted for dry isolated dam-and-pump crossings.

Based on these literature reviews, the following basic conclusions can be drawn concerning increases in sediment concentrations associated with dry dam-and-pump pipeline crossing construction:

- Measured sediment concentrations associated with installation of structures for dam-and-pump crossings at the beginning of crossing construction and removal of structures when the crossing is completed range from 60 to 1,100 mg/L, with an average of 76 mg/L above background levels. These are short-term effects; once work activity stopped, sediment concentrations returned to background levels within 2 to 10 hours.

- Increases in sediment concentration over background levels during the instream construction (trenching and backfilling) of crossings using dam-and-pump methods cited in the literature generally ranged from 4 to 20 mg/L, with a mean concentration above background of 8.5 mg/L. Pacific Connector’s predicted sediment concentrations are consistent with the literature and well within this range (2017 PCGP Resource Report 3, table 3.2-25).

- Total sediment yield varies with the size of the crossing, stream velocity, substrate and bank material, and other factors. As a comparison, using culvert removal with some mitigation (Foltz et al. 2008), total sediment amounts mobilized during crossing construction are expected to be in the range of 0.1 to 0.5 cubic feet, or less than a wheelbarrow of material on most crossings. This is roughly equivalent to a small bank slough.
- Durations of increased sediment concentrations depend on the time it takes to complete the crossing. Most streams on NFS lands are small and can be crossed in 1 to 2 days. Larger perennial streams may take as long as 5 days to complete construction. Once work activity stops, sediment concentrations typically return to background levels within 2 to 10 hours.
- The distance that increased sediment concentrations and deposition occur downstream depends on the size of the material in suspension, stream velocity, and other variables (see table 3.2-25, Resource Report 3).
- Predicted project-related increases in sediment concentrations are well within the historic range of variation for episodic pulses of sediment in Pacific Northwest watersheds.
- By comparison, culvert removal, which is a routine management action conducted by the Forest Service, may generate sediment concentrations that are an order of magnitude higher than those observed in dry dam-and-pump pipeline crossings where the construction area is isolated from the stream. Where culvert removal projects diverted the stream from the work area and installed sediment traps, amounts were similar to those expected from dry dam-and-pump crossings.

Effects of Increased Sediment Concentrations on Aquatic Biota

Effects of sediment on salmonids and other aquatic biota have been the subject of numerous studies. Both fish and invertebrate communities may be impacted by increases in sediment concentration.

One of the most widely cited studies of the effects of sediment concentrations on fish was conducted by Newcombe and Jensen (1996), who used 80 published and adequately documented studies to develop empirical equations (multiple regression models) relating the biological response of fish receptor groups to suspended sediment concentrations (mg/L) and duration of exposure (hours), which combined constituted "dose." The five receptor groups of direct relevance to assessing impacts of PCGP project stream crossings are as follows:

- juvenile and adult salmonids (171 data triplets);
- juvenile salmonids (63 data triplets);
- adult salmonids (108 data triplets);
- salmonid and nonsalmonid eggs and larvae (43 data triplets); and
- adult nonsalmonids (22 data triplets).

For each of these receptor groups, the documented effect(s) of suspended sediment exposure were categorized into one of 15 severity of ill effects categories (SEV), from 0 (no effect) to 14 (>80% mortality). These categories were then aggregated into four effect groups, as follows:

- nil effect (SEV=0);
- behavioral effects (SEV = 1 to 3);
- sublethal effects (SEV = 4 to 8); and
- paralethal and lethal effects (SEV = 9 to 14).

Newcombe and Jensen's paper noted the sensitivity of egg and sac-fry stages to increased sediment concentrations. Instream work windows regulated by the ODFW restrict timing to avoid periods when sensitive life stages of salmonids such as eggs or sac-fry are present.

Following on the work of Newcombe and Jensen (1996), Anderson et al. (1996) developed a dose-response (multiple regression) model to relate habitat alteration and changes in productivity to sediment concentration duration, finding that the duration of exposure played a more dominant role in determining habitat effects than did sediment concentration. The authors suggested that Newcombe and Jensen's (1996) SEV level of 7 be used to identify when sediment concentrations might be expected to cause habitat damage as measured by a change in the invertebrate community (p. 32).

Reid et al. (2004) conducted a detailed examination of the effects of elevated sediments associated with pipeline construction on fish physiology. The author studied the physiological response of caged rainbow trout downstream of simulated open-cut stream crossings on Serviceberry Creek in Alberta (0.46 m^3/s discharge, construction duration 30.7 hours, cages 19 and 40 meters downstream, background sediment concentration of 226 mg/L) and Conestoga River in Ontario (4.8 m^3/s discharge, construction duration 28.9 hours, cages 40 and 100 meters downstream, background SC 50 mg/L). Mean sediment concentrations in Serviceberry Creek were raised to between 55 and 70 mg/L and peaked at >1,400 mg/L. On Conestoga River, mean sediment concentrations were raised by 65 mg/L and peak sediment concentrations by more than 450 mg/L. Physiological stress increased, as reflected by elevated rates of respiration (i.e., oxygen consumption) and loss of equilibrium, as well as by altered blood hematocrit levels, indicating potential damage to gills and hence decreased transfer of oxygen. The authors found that their results were consistent with the acute stress response defined by Newcombe and Jensen (1996).

Applying these concepts to the effects of pipeline construction, Trettel et al. (2002) collected data on sediment concentrations at stream crossings on a pipeline project in New Hampshire constructed using the dam-and-pump method and compared it to Newcombe and Jensen's (1996) SEV model for juvenile and adult salmonids. The average SEV rating for dam-and-pump crossings was 6.42, a sublethal score that would equate to moderate physiological stress on juvenile and adult salmonids on Newcombe and Jensen's SEV model. Thirty-six (36) percent of the crossings in Trettel et al. (2002) exceeded an SEV of 7.0. The authors note that it is unlikely that an SEV of 7 would cause long-term damage to fish populations or habitats because of the short-term nature of most crossings and the rapid removal of the small amounts of fine sediments deposited downstream, typically in the first post-construction storm event. Due to the small stream reach impacted by increased suspended sediment loading, fish could temporarily move out of the area if they are under stress. The authors also discuss the relationship of SEV to grain size of sediments in the construction area. One hundred (100) percent of sand and boulder crossings, 80% of sandy crossings, and 81% of loamy sand crossings had an SEV <7. By contrast, 29% of crossings with 0 to 20% silt, 42% of the crossings with 21 to 40% silt, and 89% of the crossings with 41 to 60% silt have an SEV >7. Trettel et al. (2002) note that high-silt crossings require more time, thereby extending the duration of exposure (and hence increasing the SEV). The study notes that construction during low-flow periods could lead to higher SEV values due to a higher residency time of suspended sediment and concludes that an SEV of 8.0 or 9.0 would better represent damage to fish populations.

Downstream transport and deposition of suspended sediment depends on many factors including the size of particles mobilized, stream gradient, and velocity and stream volume. For most individual crossings, the downstream distance where sediment concentrations above 17 mg/L (a level that may cause avoidance or stress) is estimated to be about 61 feet, with a range of 40 to 211 feet, depending on stream size (FERC 2010, p. 4-367). Typically, construction of a crossing takes 24 to 48 hours at most sites, so this displacement would be short term, minor, and generally limited to the construction site.

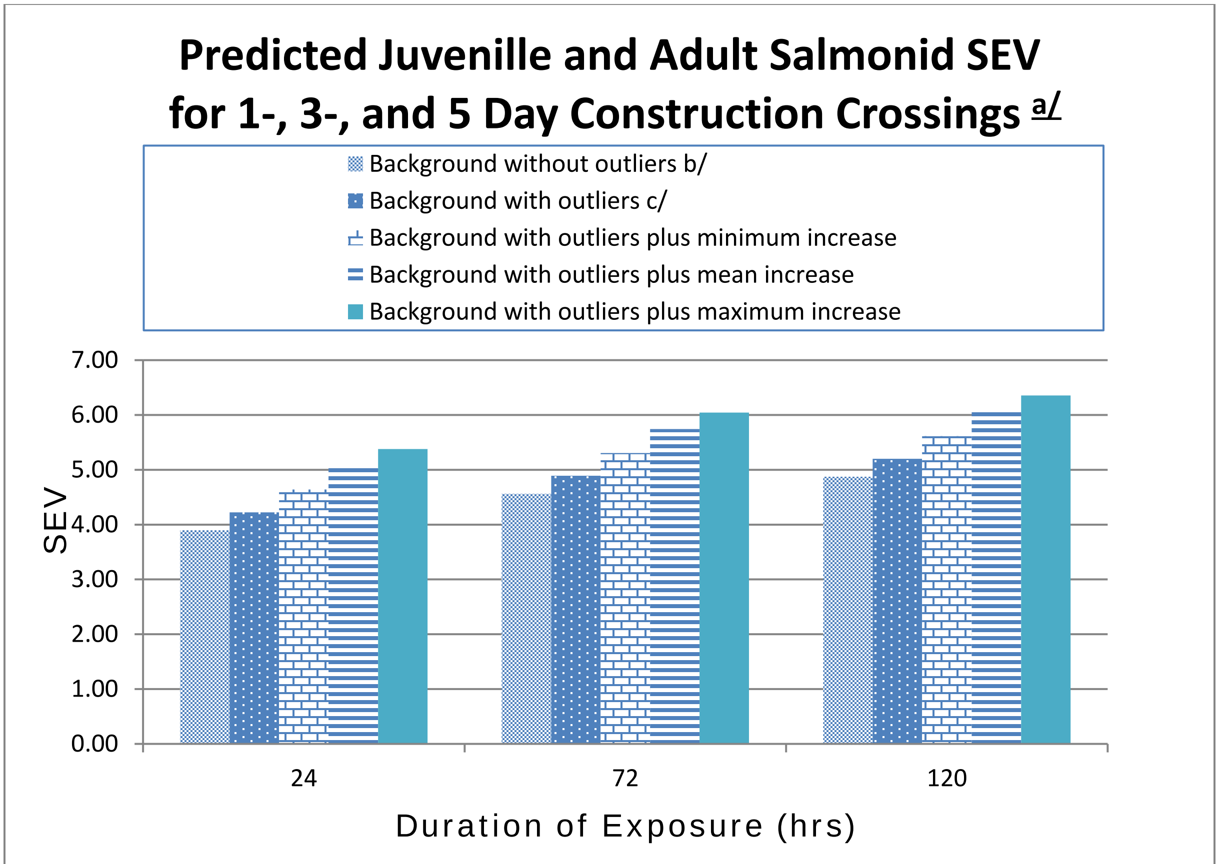
Using Newcombe and Jensen's (1996) model, SEV values for juvenile and adult salmonids were calculated for 1-, 3-, and 5-day sediment concentration exposures predicted for dam-and-pump crossings on the PCGP corridor (figure 1.3-5). Based on this evaluation, sediment associated with construction when added to background is likely to cause behavioral changes such as avoidance or cause minor physiological stress (SEV 4-6) and may cause moderate physiological stress (SEV 6), depending on the duration of exposure, but is unlikely to have paralethal or lethal effects (SEV 9 and above). This evaluation using empirical data is consistent with results from Pacific Connector's application of Newcombe and Jensen's model (Resource Report 3, table 3.2-22 (see Chapter 4, References)).

Many studies have reported a decrease in invertebrate abundance and a change in community composition as a result of sediment increases. Invertebrate species may be affected by pulses in sediment concentrations similar to those predicted with dam-and-pump crossing construction.

Newcombe and MacDonald (1991) reviewed more than 70 papers on the effects of suspended sediments and concluded that aquatic biota responds to both the concentration of suspended sediments and duration of exposure, noting that aquatic invertebrates are at least as sensitive to high levels of suspended sediment as salmonid fishes and perhaps more so. Based on Newcombe and MacDonald's findings, shorter term crossings (1 to 2 days) and/or crossings in coarser sediments (sand and gravel) would have relatively less impact on invertebrate communities than longer duration crossings that may include more silt and clay components.

Shaw and Richardson (2001) exposed invertebrate and juvenile rainbow trout to periodic pulses of sediments every 2 days for 9 days at a concentration of 704 mg/L. This study did not show a dose-related response until the fifth pulse (day 9). By this point, both drift and benthos abundance as well as benthos family richness were altered. This is consistent with Newcombe and MacDonald's (1991) finding that aquatic biota responds to both the concentration of suspended sediments and the duration of exposure. In evaluation of a wet open-cut pipeline crossing (which may generate 20 times the sediment associated with dry dam-and-pump crossings) in Ohio, Reid et al. (2002) found that increased fine sediments in riffle habitats downstream of the construction site coincided with a reduction in benthic invertebrates; however, populations rebounded and no long-term (>1 year) effects were observed.

Figure 1-6 Range of Predicted Severity Exposure Values (SEV)



a/ Newcombe and Jensen (1996). "Salmonids" include Chinook, coho, and steelhead.
b/ USGS gage data for ODFW work window without irrigation-affected data.
c/ "Outliers" includes gage data from high-sediment concentration irrigation-affected water in the S. Fork Little Butte Cr. This is a conservative analysis intended to account for the full range of current conditions.

In coastal streams, coleoperans (beetles) are most common during summer and fall and benthic and/or lotic habitats would be most likely to be affected locally by downstream turbidity and at the instream construction sites. Dipterans, caddisflies, mayflies, and stoneflies are prey for juvenile coho salmon and are likely to be relatively more abundant in some benthos and water columns during summer and fall (FERC 2010).

In the Oregon Cascades, dipterans are most common during summer and fall and benthic and/or lotic habitats would be most likely to be affected locally by downstream turbidity and at the instream construction sites. As noted above, dipterans (true flies) are prey for juvenile coho salmon as are mayflies (ephemeropterans) and stoneflies (plecopterans), which become relatively more abundant in some benthos and water columns during the fall. Mayflies and stoneflies are likely to become more abundant in lotic communities during fall construction while springtails (collembolids) and mayflies are expected to be present in stream water columns during summer and fall, with stonefly abundance increasing during fall in the streams in the South Umpqua watershed. Those species would be most likely to be affected in the short term by turbidity generated during dry open-cut construction (FERC 2010).

Considering the lack of long-term impact on downstream habitats from levels of sediment predicted with dry dam-and-pump crossings (Reid and Anderson, 2002, Reid et al. 2002), any impact on invertebrate populations is expected to be localized to the area of construction or immediately downstream and of short duration. Since downstream habitat is not likely to be substantially altered by crossing construction, it is expected that affected areas would quickly be recolonized should local populations be affected.

Summary and Conclusions

Figure 1-7 summarizes predicted sediment concentrations and the effects of project phases expressed in terms of suspended sediment concentration (SSC). Based on the information in this figure, the following basic conclusions can be drawn concerning increases in sediment concentrations associated with dam-and-pump pipeline crossing construction on aquatic resources:

- Construction-generated sediment concentrations that may adversely affect aquatic biota are generally short term (brief spikes that quickly dissipate) and limited to the construction area or short distances (<100 meters) downstream.

- Juvenile and adult salmonids are mobile and are most likely to simply move away or avoid the affected area during periods of construction.

- Eggs and sac-fry are extremely sensitive to sediment and would likely be adversely affected by predicted sediment levels. These life stages cannot move away to avoid sediment; however, instream work windows used during construction also avoid periods when sensitive egg or sac-fry life stages are present.

- Short-term spikes in sediments (<24 hours) associated with installation and removal of dams may cause moderate physiological stress for juvenile or adult salmonids that remain in the project area but would be unlikely to cause paralethal or lethal effects because sediment concentrations are unlikely to reach paralethal or lethal concentrations for periods greater than 24 hours and sediment levels would quickly return to background levels once disturbance stops, even when sediment concentrations are above 1,000 mg/L.

- The amounts expressed in total weight of entrained sediment from crossings are expected to be small and comparable to natural events such as a bank sloughing.

- Duration of exposure has more of an effect than magnitude of exposure (figure 1-6). It is anticipated that most stream crossings on NFS land can be accomplished in 1 to 5 days, with some accomplished in less than 48 hours. Based on past studies (Reid and Anderson 2002, Reid et al. 2002, Trettel et al. 2002), elevated sediment concentrations associated with dry dam-and-pump crossing construction periods are not predicted to reach sustained levels that would have paralethal or lethal effects, even if crossing construction spans several days (figure 1-6).

- Invertebrate populations may experience increased drift or mortality in the immediate project area, but these effects are expected to be short-term and minor in scale because habitat would not be lost.

- Sediment concentrations predicted by Pacific Connector using models developed by Ritter (1984) and Reid et al. (2004) are within the range of sediment concentrations reported from empirical data (Reid and Anderson 2002, Reid et al. 2002). In other words, predicted sediment concentrations using two different approaches (calculated from models vs. empirical data) are relatively close.

- Sediment-related cause-and-effect relationship thresholds on salmonids for physiological stress and paralethal and lethal effects are widely separated in terms of magnitude and duration (figure 1-7). Because of this separation in scale, predicted increases in sediment concentration and duration of sediment exposure are unlikely to cause paralethal or lethal effects in salmonids.

- Background sediment concentrations (typically <5 mg/L) plus project-caused sediment associated with trenching and backfilling (typically 4 to 20 mg/L) would result in total sediment concentrations that would likely be in the tens of mg/L during construction of stream crossings with flowing water. Reid et al (2002) found 90% of dam-and-pump crossings increased sediment concentrations over background by less than 25 mg/L. These levels may, depending on duration, cause behavioral changes or moderate physiological stress for any fish that remain in the project area but are unlikely to cause paralethal or lethal effects.

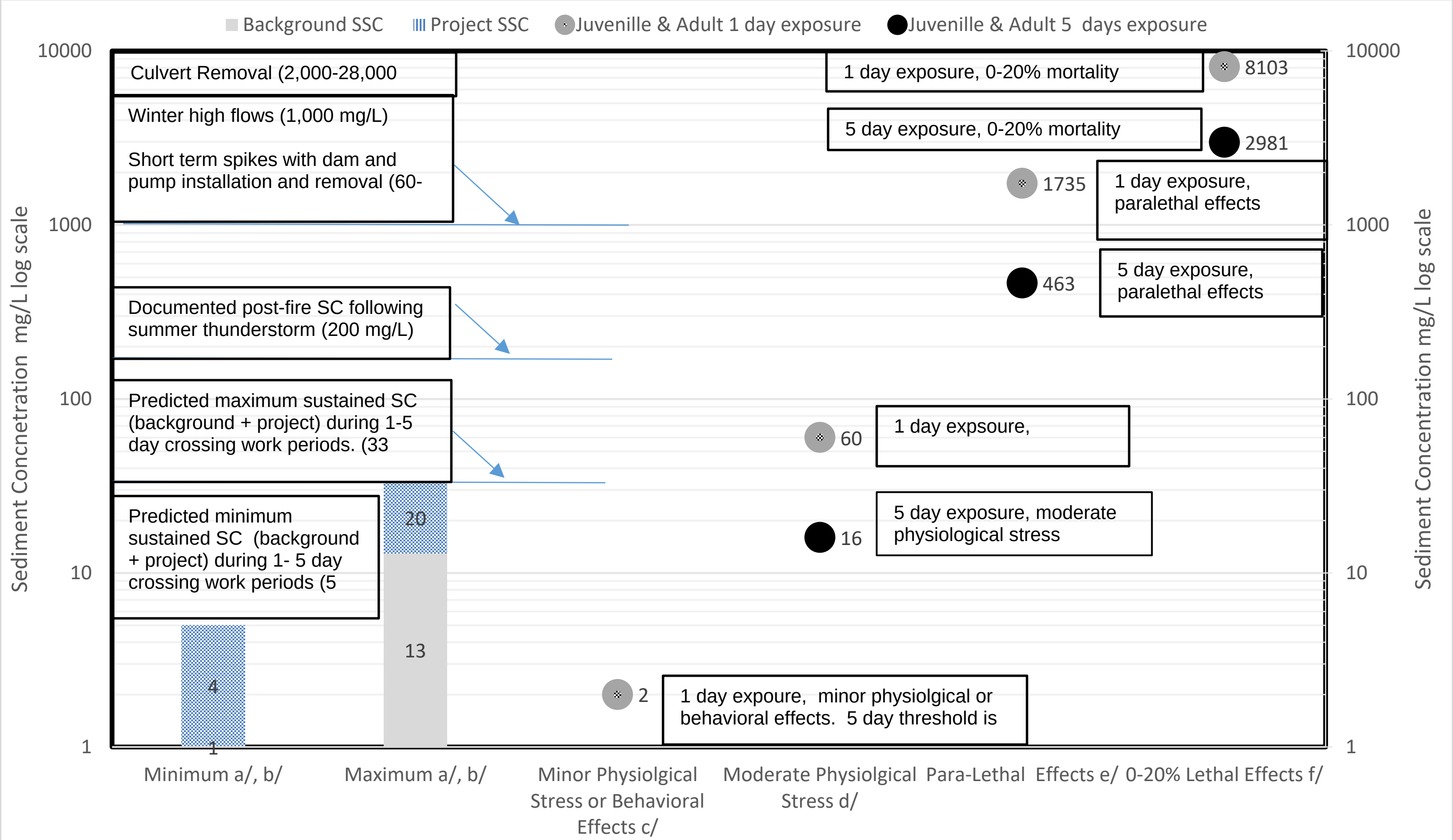
- Sediment concentrations in the hundreds of mg/L for several days are necessary to cause paralethal effects. Although project-related sediment concentrations may have brief spikes (2 to 10 hours) in the hundreds up to 1,100 mg/L, these are of insufficient duration to cause paralethal effects.

- Sediment concentrations in the thousands of mg/L are necessary to cause mortality. Project-related sediment concentrations are not predicted to reach these levels.

- The large differences in magnitude between predicted project effects (tens of mg/L) and thresholds for paralethal (hundreds of mg/L) and lethal effects (thousands of mg/L) reinforce the conclusion that project effects on salmonids would be limited to moderate physiological stress response and that construction-generated sediment is not likely to have paralethal or lethal effects on fish.

- Predicted increased sediment concentrations associated with dam-and-pump crossings are limited in time and space and are not outside the range of variation for timing, duration, or magnitude of effects when compared to sediment concentrations associated with natural disturbance events. The amount of sediment likely to be suspended in the water column is comparable to a site-scale event such as a bank slough or a bankside tree uprooting. A fire or intense rainstorm event would likely generate sediment concentrations and amounts that are orders of magnitude larger.

Figure 1-7 Predicted Sediment Concentrations and Effects on Juvenile and Adult Salmonids for 1 and 5 Day Exposures



a/ Background Sedmient Concentration range is taken from USGS gage data during the ODFW in-stream work window in watersheds where the project occurs.
b/ Predicted Project SC is based on literature review and empirical data collected from dam-and-pump stream crossings (Reid et al., 2002).
c/ Newcombe and Jensen (1996) as summarized by ODEQ (2008). Behavioral effects include avoidance, alarm reaction, etc. Sublethal effects include reduction in feeding, minor physiological stress etc.
d/ Newcombe and Jensen (1996) as summarized by ODEQ (2008). Moderate physiological stress, increased respiration, coughing etc.
e/ Newcombe and Jensen (1996) as summarized by ODEQ (2008). Paralethal effects include reduction in feeding rate, poor physical condition, delayed hatching, etc.

Surface Erosion and Sediment Routing

Pacific Connector assumes that the soils within the construction right-of-way would be categorized within the high to very high erosion hazard classes because all vegetation within the right-of-way would be removed and soils would be disturbed during grading, trenching, backfilling, and restoration activities. Surface erosion risk would be highest in the first winter following clearing for the project. Without application of erosion control measures, significant surface erosion within the construction corridor would likely occur. Where stream intersects occur or where overland flows could reach stream channels, eroded material could be deposited in stream channels and adversely impact aquatic habitats. Possible effects of uncontrolled erosion include loss of topsoil and soil productivity, rill and gulley formation, and excessive sediment transport and deposition to stream systems. While many of the landscapes crossed by the project are erosionally active, the chronic fine-grained sediment created by *uncontrolled* surface erosion would not be consistent with the objectives of the ACS.

No combination of erosion control measures can achieve 100% control of all erosion; however, it is possible to substantially reduce surface erosion and sediment transport to aquatic systems. Seeding, while an excellent erosion control method, has a low probability of reducing the first season erosion because most of the benefits of the seeded grass occur after the initial early-season events that may cause surface erosion (Robichaud et al. 2000). Conversely, erosion control structures should be considered only as temporary measures to hold the soil in place until vegetation can become established and stabilize stream banks and disturbed surfaces permanently (Forest Service 2013). Effective control of surface erosion would require a combination of mechanical erosion control methods, maintenance of effective ground cover, and aggressive reestablishment of native vegetation.

To minimize potential soil erosion, Pacific Connector has prepared an Erosion Control and Prevention Plan with active participation and engagement from the Forest Service. Pacific Connector would assume that all areas along the construction right-of-way where slash is redistributed would have a high to very high erosion hazard class. Pacific Connector would therefore apply slash (including wood chips, where available) at a minimum percent effective cover of 65 to 85% of the right-of-way. Table 10.15-1 of the ECRP provides effective ground cover requirements based on potential erosion hazard and is reproduced below as table 1-13.

TABLE 1-13

Minimum Effective Ground Cover Requirements

Erosion Hazard Class	**Minimum Percent of Effective Ground Cover a/, b/**
Low	25%
Moderate	45%
High	65%
Very High	85%

a/ Effective ground cover is considered to be all living or dead herbaceous or woody materials, synthetic materials, and rock fragments greater than 3/4'" in diameter that is in contact with ground surface and considered to be stable and resistant to downslope movement.

b/ As recommended by the Forest Service on the Umpqua National Forest, between about MPs 109 and 110 provide 100% post-construction ground cover on all disturbed areas to minimize surface erosion and prevent mobilization of naturally occurring mercury from the Thomason cinnabar claim group (see Contaminated Substances Discovery Plan/appendix E of the POD).

The ECRP for the project describes the erosion control measures that would be implemented during corridor clearing to minimize transport of sediment to adjacent and nearby aquatic habitats. The FERC Environmental Inspector, in cooperation with the Forest Service, would determine appropriate temporary measures to minimize potential erosion and sedimentation effects during and after timber-clearing operations. These measures may include:

- Leaving slash generated during timber-clearing operations on the corridor to reduce erosion over the following winter. This measure minimizes raindrop impacts and overland flow.
- Scarifying compacted surfaces, where appropriate, to promote infiltration and reduce runoff.
- Use of additional slash/brush piles and coarse woody debris (limbs to large logs) at appropriate locations to minimize off-site runoff and sedimentation. Coarse woody debris placed on contour has been shown to be an effective hillslope measure to reduce erosion (Robichaud et al. 2000).
- Installation of slope breakers (water bars) at appropriate locations and spacing to shorten slope lengths, prevent concentrated flow, and divert runoff to stabilized areas. Waterbars are a proven and effective method of reducing the erosive energy of overland flow, diverting overland flow and minimizing sediment transport.
- Installation of silt fences and straw bale sediment barriers to prevent transport of sediment to aquatic habitats. Pacific Connector has committed to installing and maintaining erosion control structures, including silt fences, at stream crossings until effective ground cover is reestablished. Silt fences are 90 to 95% efficient at trapping sediment (Robichaud et al. 2000).
- Temporary seeding (using appropriate quick-germinating cover crops such as annual ryegrass or other appropriate cover species), where not precluded by federal restrictions on introduced species.
- Mulching of corridor areas that do not have sufficient cover. Geotextile fabric erosion control blankets may also be used to provide temporary ground cover. Mulching reduces raindrop impacts and, when in contact with the ground, limits overland flow and sediment transport.

Mulch materials specified in the ECRP (Pacific Connector Gas Pipeline 2013:44) include:

- Slash from clearing.
- Wood fiber mulch applied as hydromulch at 2,000 pounds/acre.
- Bonded fiber mix (BFM) on slopes greater than 2.5 to 1 (i.e., 40%). BFM is similar to wood fiber mulch, but it has properties that allow it to remain strong and insoluble after its initial drying. BFM reduces erosion by a) absorbing the impact of rainfall while still allowing water to filter through, and b) absorbing water like a sponge to prevent overland water flow and rilling. It creates a strong and durable mat of interlocking fiber strands held together by a bonding agent that is water resistant and would withstand reexposure to

moisture without redissolving or losing its adhesive quality. Once dry, it forms a water-absorbent protective mat that is porous and breathable and secures soil and seed until vegetation is established. BFM is designed to mix and flow easily when wet and yet remain strong and insoluble once dry, protecting the soil surface from repeated rains and sheet flows. BFM can be applied prior to a rainy season or late in the year as it is formulated to endure the harsh conditions of heavy rains and snow. In time, BFM biodegrades completely into natural organic compounds that are beneficial to plant life. It is safe to use in riparian zones and watersheds. Because BFM is sprayed on, the site remains relatively undisturbed, further reducing the risk of erosion.

- Straw mulch that is certified weed-free by the appropriate state certification program. In 2009, Oregon established a voluntary pilot Weed Free Forage Program that certifies both grass and alfalfa hay and straw. The contractor would deliver weed-free certification documents from this program to the Environmental Inspector prior to applying any straw mulch. However, if the certification program is not in place at the time of construction or if there are not sufficient quantities of certified weed-free straw available for the project, the contractor would request review/inspection of the straw by the local soil and water conservation district, county agent, or other appropriate official or authorized agency representative on federal lands. Any straw that is found to contain noxious weeds during application would be immediately removed from the project right-of-way and properly disposed of in a public landfill. The mulch would be uniformly applied at a rate of 2 tons/acre to cover the ground surface. Mulching would occur immediately after seeding where broadcast- or drill-seeding occurs. Anchoring the mulch is not expected to be necessary because strong winds that could dislodge the mulch typically occur during the winter rainy season when the moist conditions would bind the straw to the soil. Liquid mulch binders are not expected to be used unless hydromulch is applied. Liquid binders would not be used in wetlands or waterbodies.

Erosion control following high-intensity fire provides a useful comparison for effectiveness of erosion control methods. It has been demonstrated that sediment transport in post-fire situations can be reduced by 85 to 95% (Robichaud et al. 2000, Wagenbrenner et al. 2006). Effective erosion control requires a combination of actions. Effective ground cover prevents the mobilization of sediment by absorbing raindrop impacts and, when in contact with the ground, minimizing overland flow of water. Waterbars minimize erosion by shortening the distance water can travel overland and diverting water off disturbed slopes. Erosion control seeding provides temporary vegetation until permanent revegetation is accomplished. Maintained silt fences provide a backstop that is 90 to 95% effective at trapping sediment, including fine-grained silt (Robichaud et al. 2000). Weed-free straw bales placed as part of the installation create a resilient, highly effective sediment barrier that requires little or no maintenance.

The combination of effective ground cover from mulch and coarse woody debris, waterbars to slow and divert water off the construction area, installation and maintenance of silt fences and other sediment barriers, and aggressive grass seeding and fertilization followed by reestablishment of native vegetation is expected to reduce any sediment transport to aquatic systems by 85 to 95% from levels that would be experienced without application of these methods. Sediment contributions from the pipeline corridor are expected to be at or near background levels during dry summer months. During winter rains, some increase in sediment transport from the corridor may occur, but it is expected to be minor and undiscernible against background levels. When compared to current watershed conditions in watersheds crossed by the project, sediment contributions from existing roads, and past management activities, any sediment mobilized from the PCGP corridor would likely be an insignificant contribution to the overall sediment budget of the affected watersheds. It is highly unlikely that the PCGP corridor would become a chronic source of fine sediments with the application of the measures specified in the ECRP.

If implementation or post-project monitoring shows evidence of unacceptable sediment transport, as defined by the Forest Service, to aquatic systems, Pacific Connector would be required by the terms of the Right-of-Way Grant to implement additional erosion control measures as needed and as directed by the Forest Service, to reduce sediment transport to background levels. Evidence of "unacceptable" levels of sediment transport would include silt fences or other sediment barriers that are not maintained, lack of effective ground cover, visible turbidity at channel crossings, visible evidence of sheet or gulley erosion where sediment is transported to aquatic systems, or chronic deposition of fine sediments as evidenced by turbidity or sediment deposition downstream of crossings.

Site-specific erosion concerns will be addressed as needed specific to the individual watersheds discussed in Section 2.

General Use and Maintenance of Roads

The TMP, which is part of the POD, provides maintenance standards for use of roads by the project. Standards and guidelines from the NWFP for road maintenance, construction, and reconstruction are part of the TMP (table 1-4). Compliance with these standards and guidelines is intended to ensure the use of roads associated with the project does not prevent attainment of the ACS objectives.

Individual road construction or reconstruction issues will be addressed as needed specific to the individual watersheds discussed in Section 2.

1.4.1.3 Water Quality—Temperature

Stream temperatures are highly variable both temporally and spatially (Poole et al. 2001). Stream temperature fluctuations of several degrees in a 12-hour period are possible in small channels. As a result, measuring and interpreting stream temperatures is inherently complex. It is possible to record data at any given point with a great deal of precision, but it quickly becomes speculative to apply that data at broader scales with the same degree of precision.

Topography, slope position, aspect, and effective shade cover influence water temperatures during the summer months. Stream temperatures are also influenced by stream position in the watershed, channel condition, and volume of flow. Large woody debris influences channel condition by narrowing stream channels, creating pools, and affecting water velocity. Conditions favoring high daily maximum stream temperatures include shallow and wide streams, north-south channel orientation, low groundwater influx or hyporheic exchange with the channel, and a low gradient (Nicoleta and Janisch 2007).

The PCGP would remove vegetation that may currently provide effective shade at perennial and intermittent stream crossings. The degree of effective shade loss from corridor construction varies by stream and depends on stream orientation, topography, channel width, and adjacent tree height. Loss of shade on intermittent streams is not expected to measurably influence water temperatures because stream crossings are generally widely separated, intermittent streams are typically discontinuous or dry by late summer when water temperature becomes an issue, or when stream volumes are low enough to not influence larger perennial channels. For perennial streams, the position of the stream in the watershed influences the effects of shade loss. Loss of effective shade on reaches of perennial streams in upper parts of a watershed appears to be important to elevation of stream temperatures and may in some cases influence stream temperatures downstream from the point where the loss occurs. On the downstream reaches of perennial streams, shading appears to have much less effect on water temperature (Brown 1970, cited in North Fork Coquille watershed assessment, p. 7-12), possibly due to the higher volume of flow in these lower reaches.

There are five perennial stream crossings on NFS lands where corridor construction could remove shading vegetation. To evaluate whether corridor construction would increase water temperatures, a site-specific field evaluation of stream temperature impacts on the five perennial stream crossings on NFS lands was conducted in 2009 and again in 2013 and 2019 to account for different proposed stream crossings as a result of slight changes in the PCGP alignment (the number of perennial stream crossings on NFS lands has not changed) (NSR 2009, 2015; Stantec 2019). Each temperature evaluation showed that with mitigation measures, any temperature increases would be less than 0.2 °C and would be limited to the point of maximum impact. No impacts were predicted at the stream network scale because of the small volume of affected streams, likely groundwater inputs, and the assimilative capacity of the stream network. On-the-ground conditions and water temperature model results suggest that it is unlikely that the stream temperature downstream of any of the perennial crossings would be increased above the ODEQ Core Cold-Water Habitat temperature criteria of 16 °C (61 °F) (NSR 2009, 2015; Stantec 2019).

Perennial crossings on NFS lands in the East Fork of Cow Creek were reanalyzed in 2013 and 2019 to reflect minor changes in alignment and updated temperature and flow data (NSR 2015, Stantec 2019). A slight variation in the 2019 PCGP alignment eliminated crossings Hydrofeature J and Hydrofeature K that were included in the 2013 temperature assessment and added two new crossings referred to as EFCC-1 and EFCC-2. This realignment also eliminated a section of the alignment that was parallel to a perennial stream, therefore excluding an amendment to the Umpqua National Forest LRMP (UNF-2). The 2019 temperature assessment (Stantec 2019) refers only to the two new crossings; therefore, it does not replace the assessment conducted in 2013 (NSR 2015) because results for Hydrofeatures C, G, and N included in the 2013 assessment are still valid. The Stream Segment Temperature Model (SSTEMP; Bartholow 2002) was selected for the 2013 and 2019 assessment because it is the modeling tool most often used by the relevant agencies and could provide outputs for single stream segments using available data. This is also the model used in the NSR 2009 analysis. Data recorders were placed at selected locations, and 7-day average high temperatures were recorded for each crossing during the warmest part of the summer with lowest recorded flows. Flows in the 2013 and 2019 data year were about 33% of those modeled in 2009. This provided a “worst case” assessment of potential project impacts on stream temperatures. To validate the model, existing conditions were entered and predicted temperatures were compared to measured temperatures. When compared to measured existing conditions, the SSTEMP model overstated actual stream temperature increases by as much as 2.0°F in the 2013 assessment and was within 0.1°F of modeled temperatures in the 2019 assessment. If the SSTEMP model overstated the existing condition, then it would also be expected to overstate the post-construction impacts. This highlights the inherent uncertainty and high variability in measuring stream temperatures in low-volume channels.

Modeling of stream temperatures *with 0% effective shade retention* in the East Fork of Cow Creek on the Umpqua National Forest using SSTEMP showed potential temperature increases *without mitigation* of 1.0°F to 5.1°F.[8] Measured stream volumes ranged from 0.02 cubic feet per second (cfs) to 0.115 cfs, which are very low flows and correlate with modeled temperature increases. As noted above, this is a drought condition assessment and may not be typical of most years or of post-construction shade levels. While there is a great deal of inherent variation in the stream conditions and a measure of uncertainty in the SSTEMP model results, results of the NSR 2013 (NSR 2015) and Stantec (2019) assessments suggest that in a low-flow scenario without mitigation, there could be potential for temperature increases above the total maximum daily load (TMDL) thresholds (0.1°C or 0.18°F at the point of maximum impact) or ODEQ Core Cold-Water Habitat temperature criteria of 16°C (61°F) in small perennial channels in the East Fork of Cow Creek fifth-field watershed.

Although exposure to solar radiation may cause temperature increases, temperatures downstream from limited stream-side forested clearings have often been found to cool rapidly once the stream re-enters forested regions (Zwienieck and Newton 1999). Other studies have noted downstream cooling below timber harvest areas as well, but the extent of this cooling is not entirely clear and varies by stream (Moore et al. 2005, Poole et al. 2001). Although there is some debate on the magnitude of cooling provided by riparian vegetation and the extent to which stream temperatures return to non-cleared temperature levels after exiting a cleared area, studies emphasize that riparian buffers assist in maintaining water temperatures (Correll 1997, Gomi et al. 2006). Generally, changes in temperature, especially in small streams, may recover quickly from cooler surrounding conditions downstream (e.g., streambed cooling, evaporation, hyporheic inflows, shade). This was validated by stream temperature data recorded on the Umpqua National Forest in 2013. Preliminary results from field measurements of existing conditions on the Umpqua National Forest showed decreasing stream temperatures of as much as -7.6°F/100 feet with an overall average over 2,040 feet of the East Fork of Cow Creek of -0.1°F/100 feet (NSR 2015). The presence of a number of small wetlands adjacent to the stream channel provides evidence of likely groundwater interactions. Most of this 2,040-foot reach also has substantial shade. This suggests the retention of shading structures, or at least partial shade, may greatly reduce increases in stream temperature. These data also support the NSR 2009 and Stantec 2019 findings that potential temperature increases are partially offset by cooling from groundwater interactions in the stream channel.

Observations as part of NSR 2009, NSR 2014, and Stantec 2019 (Site Specific Stream Crossing Prescriptions) show that large woody debris and low-growing willows, huckleberries, and other brush species can provide effective shade for small, narrow channels. For example, Hydrofeature G at MP 109.47 has dense overhanging willows and other brush species that shade much of the channel. In many cases, low-growing brush outside the immediate crossing construction area can be maintained, thus minimizing shade loss. In the mainstem of the East Fork of Cow Creek, large woody debris provides significant shade and creates a complex channel structure with high retention of sand and gravel that helps maintain cooler water temperatures. As described in the

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[8] These results have not been indexed or adjusted to reflect the measured overstatement of impacts by the SSTEMP model noted above. Actual temperature impacts are likely to be less.

ECRP and waterbody crossing requirements for the project, all LWD and boulders removed from the crossing area would be replaced during site restoration and low-growing brush will be retained where possible. Many of the channels crossed by the PCGP are very small and could easily be shaded by the placement of large woody debris, larger logs, and willow plantings. Where site-specific modeling suggests temperature increases may be possible, a restoration plan to reestablish pre-crossing shade conditions using willows, logs, boulders, and large woody debris will be prepared for each of the perennial stream crossings on NFS lands. With the maintenance of existing shading brush on small channels, the placement of large woody debris, and the replanting of willows and other brush species, downstream temperatures are expected to be comparable to the existing condition and to remain below ODEQ thresholds on the East Fork of Cow Creek and its tributaries because these measures would provide immediate and effective shade. In small first- and second-order streams, any temperature increase that does occur would likely be masked by the assimilative capacity of larger streams at the stream network scale (NSR 2009).

In addition to onsite mitigation measures, there are also a number of LWD mitigation projects associated with the PCGP proposed by the applicant on both BLM and NFS lands. These mitigation projects will be as needed specific to the individual watersheds discussed in Section 2.

Pacific Connector used predictive modeling on a representative cross-section of crossings along the Pacific Connector route, spanning the ecoregions, HUCs, width classes, and aspect classes present from Coos Bay to Malin, Oregon, including stream crossings on NFS lands. Model results show a maximum predicted increase of 0.16°C over one 75-foot clearing. Thermal recovery analysis shows that temperatures return to ambient within a maximum distance of 25 feet downstream of the pipeline corridor, based on removal of existing riparian vegetation over a cleared right-of-way width of 75 feet. These findings are consistent with NSR 2009. Pacific Connector also assessed the cumulative impact of right-of-way clearing on stream temperatures. Given that mitigation for loss of effective shade would occur within the same year as construction clearing and that predictive modeling using SSTEMP shows that the local impacts are small in magnitude and spatially limited, the cumulative effects, including intermittent streams, of the proposed project on the thermal regime in the Coos, Coquille, South Umpqua, Rogue, Klamath, and Lost River basins are expected to be minor and well below detection in the field (GeoEngineers 2013f: 26).

Effects associated with loss of shade at specific crossings are discussed as necessary by watershed (see section 2).

1.4.1.4 Aquatic Connectivity

Connectivity for fish and other aquatic organisms could be affected for a short time while a waterbody is being crossed if water is flowing at the time of construction (most intermittent streams would be dry at the time of crossing and aquatic connectivity would not be impacted). Dry dam and pump stream crossings typically take about 1 to 5 days to complete, and access to habitat upstream or downstream of the construction area would be interrupted during that time. All stream crossings would be accomplished within the authorized instream work periods established by federal and state fish and wildlife management agencies (typically July 1 through September 15) in order to minimize potential effects. Specific in-channel work periods are addressed in section 2 for each channel crossing. Once a crossing is completed, the bed and banks would be restored to their original configuration and passage through the construction area would once again be unimpeded. Interruptions in connectivity are expected to be short-term and minor in scale.

1.4.1.5 Watershed Condition

The watershed assessments prepared for the relevant fifth-field watersheds indicate that road networks are extensive on many federal lands crossed by the project. In addition, the watershed assessments document that road construction and timber harvesting within and adjacent to Riparian Reserves have resulted in degraded conditions with respect to flow and sediment regimes as well as riparian vegetation structure throughout these fifth-field watersheds.

Changes to peak flows are influenced by timber harvest; overall basin condition; the age and pattern of forest stands within a larger basin; the location, age, and extent of road networks; and the extent (both laterally and longitudinally) of riparian buffers (Grant et al. 2008). Likely effects of the project on peak flows were assessed in the 2009 FEIS for the PCGP project (FERC 2009). That analysis found that it was highly unlikely that the Pacific Connector project could cause detectable changes in peak flows because of the general ridgetop routing and relative lack of stream intersects when compared to road networks, the dispersed nature of the project across multiple watersheds, and the small area (typically fractions of a percent) affected in any single watershed. The 2019 Draft EIS (DEIS) reached similar conclusions.

Soil conditions may affect watershed conditions. The proposed pipeline right-of-way would be 95 feet wide and consist of a 65-foot-wide construction corridor, with 10 feet of trench and 20 feet of excavation storage. Within Riparian Reserves and visually sensitive areas, the corridor may be reduced to 75 feet where possible. Areas that receive greater than three passes by low p.s.i. equipment result in soil compaction, which is defined on NFS lands as >15% increase in bulk density over an undisturbed reference soil condition (Forest Service 1994b: IV-67). Therefore, for the purpose of this document, it is assumed that on the 65-foot-wide working side, 80 to 100% of the cleared area would be compacted, a 10-foot-wide trench area would be displaced and mixed, and a 20-foot wide excavation storage area would be compacted or mixed during trenching and backfilling operations.

Compacted soils or barren areas may contribute to soil erosion or altered flow patterns. For the purposes of this analysis, all of the project area on the working side of the construction corridor and TEWAs would be subject to multiple passes of heavy equipment and truck traffic and, as a result, would likely have some degree of compaction. The spoil storage area may experience some degree of compaction depending on [the amount of? whether there is?] heavy equipment passage. Soil texture, moisture content, and exposure (number of passes and type of equipment) would determine the severity of compaction that may occur. Soils in this sensitive group were determined based on the Natural Resources Conservation Service rating of high or severe for the Haul Roads, Log Landings, and Soil Rutting category. Soils in this group are rated based on Unified Soil Texture Classification, rock fragments on or below the surface depth to a restrictive layer, depth to a water table, and slope. Unmitigated soil compaction can result in long-term impacts to soil productivity and increased erosion due to increased runoff.

Upon completion of construction activities, the construction corridor, with the exception of the area over the installed pipeline, would be decompacted using a winged subsoil ripper. On NFS lands, detrimental compaction would not exceed 15% or more over adjacent undisturbed soils. On

NFS lands within 100 feet of perennial or intermittent streams, detrimental compaction would not exceed 10% of the activity area within 100 feet of each stream to ensure maintenance/reestablishment of 90% of pre-disturbance infiltration rates within 100 feet of streams, as confirmed through compaction testing. The FERC Environmental Inspector would also test for soil compaction on UCSAs on federal lands to determine appropriate measures necessary to mitigate compacted areas (ECRP, p.19).

Specific measurements for the function and value of these and other ACS-relevant indicators of watershed condition, to the degree that they have been reported, are discussed for individual watersheds in section 2 of this appendix.

1.4.2 Mitigation

CEQ Regulations (40 CFR 1502.16 (h)) require that an EIS discuss the "means to mitigate adverse environmental effects" and provide appropriate mitigation measures as alternatives if not already part of the proposed action (40 CFR 1502.14 (f)). In cooperation with the Forest Service, the project proponent has identified relevant, reasonable mitigation measures that could alleviate the environmental consequences of the project, including any that are outside the lead agency's (FERC's) jurisdiction (Council on Environmental Quality 1981 #19b). Consistent with BLM's mitigation policy, the project proponent has volunteered potential mitigation projects on BLM lands within the fifth-field watersheds discussed in Section 2. These measures have also been included as part of the project description in Chapter 2 of the FERC EIS for the PCGP.

Mitigation, as defined in CEQ Regulations 40 CFR 1508.20, includes:

- avoiding effects altogether by not taking a certain action or parts of an action.
- minimizing effects by limiting the degree or magnitude of the action and its implementation.
- rectifying effects by repairing, rehabilitating, or restoring the affected environment.
- reducing or eliminating effects over time by preservation and maintenance operations during the life of the action.
- compensating for effects by replacing or providing substitute resources or environments.

It is anticipated that the proposed project design and on-site mitigation measures would help maintain or improve current watershed functions on the federal lands crossed within each fifth-field watershed. Wherever practicable, the project corridor has been routed on ridge tops or to avoid stream crossings and other sensitive riparian and aquatic habitats. Areas of potentially unstable soils were thoroughly evaluated prior to routing to help minimize potential effects.

No maintenance roads would be established along the pipeline corridor. Additionally, as described in the project TMP, use of the existing road system would result in improvement of existing conditions, thereby reducing potential sediment source areas.

The project proponent has filed off-site mitigation plans developed in cooperation with the Forest Service to minimize effects of the PCGP project on NFS lands as part of its application to FERC. The actions proposed in the off-site plan supplement on-site mitigations that are part of the project description. These off-site mitigations are intended to provide watershed benefits to offset effects of the PCGP project that cannot be completely addressed at the site level. The Right-of-Way Grant issued by the BLM would include the proposed project mitigation plan to ensure implementation.

Key ACS-related on-site mitigation measures (shown for each Habitat Element or Process and Key Indicator(s) in table 1-14) include covering streambeds crossed by the project with appropriately sized gravel or cobbles, replacing boulders and LWD at the channel crossing, restoring channel and adjacent banks to preconstruction contours, replanting the adjacent banks and riparian zone to encourage forest growth, and placing LWD (felled during right-of-way clearance) on the floodplains to provide microsite habitat for riparian species and protect riparian vegetation during flood events. These on-site mitigation measures would contribute to restoring ecosystem structure and functioning and enhancing habitat complexity at the site level.

Table 1-14 summarizes key indicators of aquatic health and site-specific and typical off-site mitigation measures proposed for the project. The off-site mitigation measures in table 1-14 emphasize LWD placement, road decommissioning/improvement, and replanting of disturbed areas. All of these mitigation measures have been shown to be particularly effective in improving watershed conditions.

Site-specific mitigation projects are described in section 2 under the appropriate fifth-field watershed. All proposed off-site mitigation projects are site-specific, feasible, and consistent with the relevant agency's land management plan objectives and can be accomplished in a reasonable time.

TABLE 1-14

Habitat Elements, Processes, and Key Indicators for Evaluation of PCGP Project Effects and Identification of Mitigation Measures

Habitat Element or Process	Key Indicator	Mitigation Measure
Water Quality - Sediment	Erosion and sediment transport associated with corridor construction	• On-Site: Apply BMPs and ECRP with onsite FERC Environmental Inspector oversight. • Off-site: Decommission and improve roads. Place LWD in stream channels to facilitate retention of sediment.
	Affected Riparian Reserves/stream crossing	• On-site: Avoid and minimize stream crossings by using ridge-top routes where possible. Use dry open-cut crossings, with pumping to remove sediment-laden water from the work area. Recontour banks and channel bottom; replace LWD and boulders in channel. • Off-site: Rehabilitate existing road crossings. Place LWD in stream channels.
Water Quality - Temperature	Removal of effective shade by corridor construction	• On-site: Avoid and minimize stream crossings by using ridge top routes. Where possible, narrow right-of-way to 75 feet. Replant trees in riparian zone to provide replacement shade. Replace LWD and boulders at channel crossing. • Off-site: Replant effective shade in Riparian Reserves that currently have inadequate shading. Place LWD and boulders in stream channels.
Habitat Access	Blockage of stream channel during construction	• On-site: Use flumes when crossing fish-bearing streams to facilitate upstream-downstream connectivity across the construction area as appropriate if this is a critical issue. No flumed passages are currently proposed or anticipated on NFS lands. • Offsite: Install fish-friendly culverts at selected sites.

TABLE 1-14

Habitat Elements, Processes, and Key Indicators for Evaluation of PCGP Project Effects and Identification of Mitigation Measures

Habitat Element or Process	Key Indicator	Mitigation Measure
Aquatic Habitat Structure	Substrate at crossing	• On-site: Restore channel bed and banks to original configuration, cap trench with cobble and gravel, restore LWD in stream channel. • Off-site: Place LWD in stream channels.
	LWD at crossing	• On-site: Place LWD in stream channels. • Off-site: Place LWD in stream channels.
	Pool quality	• On-site Select pipeline route to minimize stream intersects. Place LWD in stream channels. • Off-site: Place LWD in stream channels.
	Off-channel habitat	• On-site: Place LWD in stream channels. • Off-site: Place LWD in stream channels.
	Refugia concerns	• On-site: Place LWD in stream channels. • Off-site: Place LWD in stream channels.
Channel Conditions and Dynamics	Stream width-to-depth ratio	• On-site: Restore channel bed and banks to original configuration, cap trench with cobble and gravel, and restore LWD in stream channels. • Off-site: Place LWD in stream channels.
	Streambank condition	• On-site: Minimize disturbance of riparian vegetation. Restore channel bed and banks to original configuration or modify to stable configuration if incised or unstable, cap trench with cobble and gravel, revegetate with plantings, and restore LWD in riparian zone and stream channel. • Off-site: Replant areas without effective bank cover.
	Floodplain connectivity	• On-site: Restore channel bed and bank to original configuration. Revegetate construction area with plantings. Restore LWD in stream channels. • Off-site: Replant areas lacking effective bank cover with appropriate riparian vegetation. Decommission roads in and adjacent to riparian zone.
	Peak/base flow regime; effective size of the drainage network	• On-site: Ridge top routing of right-of-way. Implement ECRP during construction. Post-construction recontouring of stream channel in corridor to original condition. • Off-site: Decommission and improve roads.
Watershed Condition	Road density and location	• On-site: Ridge top routing of right-of-way. Post-construction recontouring of stream channel in corridor to original condition. • Off-site: Decommission roads.
	Disturbance history	• On-site: Road decommissioning in Riparian Reserves. • Off-site: Manage stand density to facilitate forest succession and resiliency. Reduce fuel on forest floor to prevent catastrophic fires. Decommission roads. Replant riparian zone and restore adjacent meadows.
	Condition of Riparian Reserves	• On-site: Decommission roads in Riparian Reserves. Thin overstocked stands in Riparian Reserves to accelerate growth of large trees and restore riparian vegetation. • Off-site: Manage stand density to facilitate forest succession. Reduce fuel on forest floor to prevent catastrophic fires. Decommission roads. Replant riparian zone and restore adjacent meadows.

2.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

2.1 REGIONAL CONTEXT

The ACS is applied at multiple scales. In order to provide a logical framework for assessment, the report of the FEMAT established physiographic provinces (Forest Service et al: IV-7). Physiographic provinces (also referred to as "provinces" or “aquatic provinces") incorporate physical, biological, and environmental factors that shape broad-scale landscapes. Physiographic provinces reflect differences in geology (e.g., uplift rates and recent volcanism, tectonic disruption) and climate (e.g., precipitation, temperature, and glaciation). These factors result in broad-scale differences in soil development and natural plant communities. Within each province, the variable characteristics of rock stability affect steepness of local slopes, soil texture, soil thickness, drainage patterns, and erosional processes. Thus, the concept of physiographic provinces has utility in the description of both terrestrial and aquatic ecosystems (Forest Service et al. 1993).

Within provinces, vegetation types, land-use practices, and responses to disturbance are typically similar. The PCGP would cross the Coast Range, Klamath-Siskiyou, Western Cascades, and High Cascades provinces (figure 2-1). The PCGP does not, however, cross NFS lands in the Coast Range province so this province is not discussed further in this document. In the following sections, the three provinces that cross NFS lands are described in terms of climate, geology, soils, vegetation, and the fifth-field watersheds within each of them (figure 2-1).

2.1.1 Key Watersheds

The NWFP identifies “key” watersheds that have regional significance for the protection of water quality and aquatic habitat. Tier 1 Key Watersheds are intended to benefit at-risk fish species and stocks by providing refugia for maintaining and recovering habitat. Tier 2 Key Watersheds provide high-quality water. Key Watersheds include areas of both high-quality and degraded habitat. Key Watersheds with high-quality habitat serve as anchors for the potential recovery of depressed stocks. Those of lower quality habitat have a high potential for restoration and would become areas of high-quality habitat if appropriate restoration measures are implemented. The NWFP designates Key Watersheds as the highest priority for restoration. Table 2-1 identifies Key Watersheds that would be crossed by the PCGP right-of-way.

Specific effects of the Pacific Connector project in Key Watersheds are addressed in the watershed descriptions in this section.

Figure 2-1 PCGP Right-of-Way with Aquatic Provinces and Fifth-field Watersheds

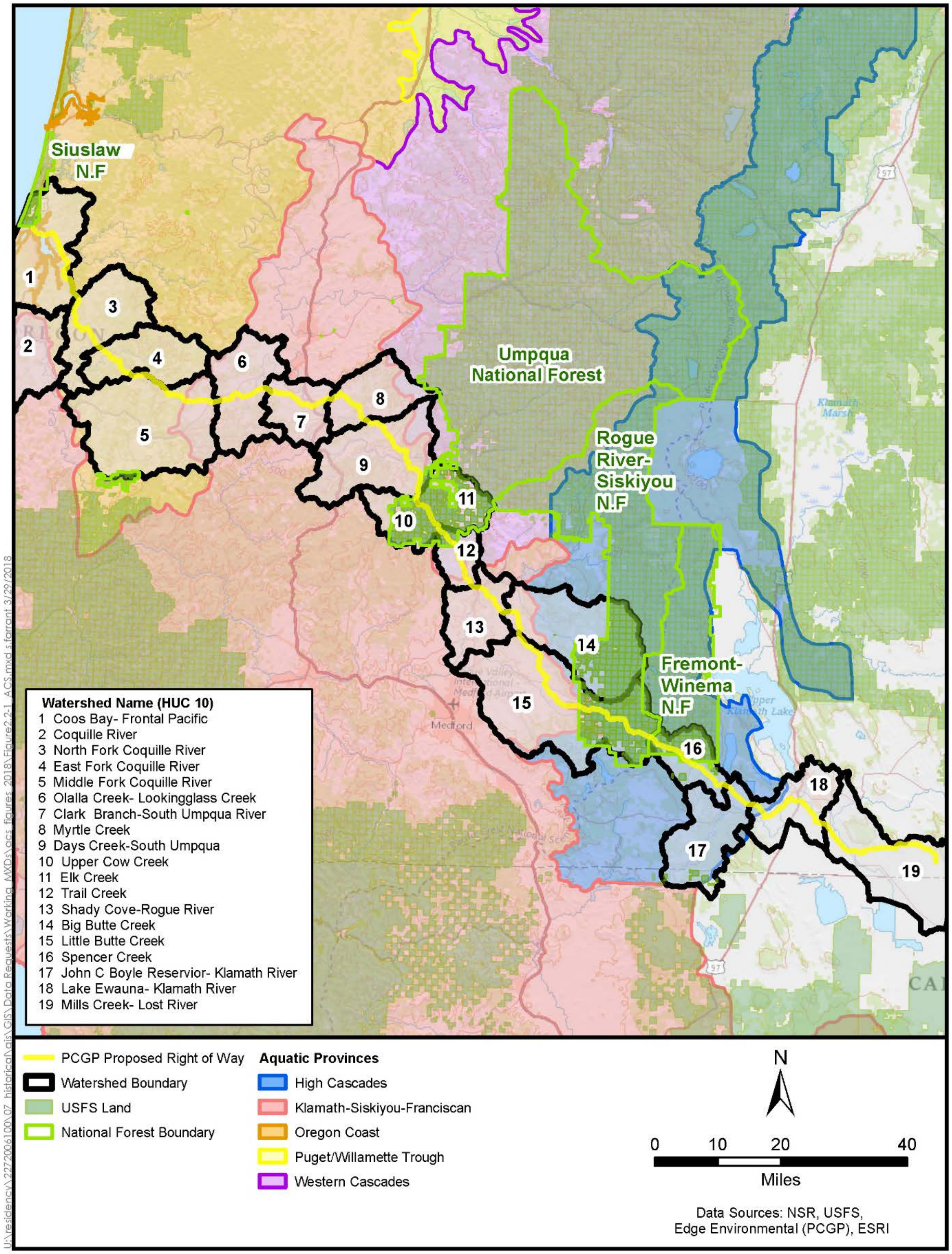

TABLE 2-1

Miles of PCGP Project Right-of-Way in Key Watersheds by Administrative Unit

Watershed	Umpqua NF Miles	Rogue River NF Miles	Winema NF Miles	Total NF Miles
Elk Cr.–South Umpqua	2.66	—	—	2.66
Days Cr. South Umpqua (Tier 1) (These 5th-field watersheds are both part of the South Umpqua Key Watershed)	1.56	—	—	1.56
North and South Forks Subwatersheds, Little Butte Cr. (Tier 1)	—	8.56	—	8.56
Spencer Cr. (Tier 1)	—	—	6.05	6.05
Clover Cr. Subwatershed, Spencer Cr.(Tier 2)				
Total	**4.22**	**8.56**	**6.05**	**18.83**

Source: Resource Report 2, Table 2.2-4

2.1.2 Historical Disturbance Processes and Patterns in the Pacific Northwest

A critical aspect of the Pacific Northwest riverine and riparian environment is the widespread occurrence of steep, unstable hillslopes. Recent geologic uplift, weathered rocks and soil, and heavy rainfall all contribute to high landslide frequency and to high sediment loads in many of the region's rivers. Hillslope steepness is one of the simplest indicators of areas prone to mass wasting (e.g., rapid mass movements of soil and organic material down hillslopes and stream channels). The response of these steep hillslopes to disturbance processes shaped the evolution of aquatic environments in the region.

In the Pacific Northwest, fire historically was the dominant watershed disturbance process (Everest and Reeves 2007). Synergy between fire and subsequent intense rainstorms and flood events may be the sequence of disturbances with the greatest effect on riparian ecosystems in the Pacific Northwest (Benda et al. 1998, cited in Everest and Reeves 2007). Wildfires temporarily increase the supply of water and sediment to fluvial systems (Malmon et al. 2007). Runoff-initiated erosion events tend to peak during the first year after a forest fire but these effects are typically short-lived (i.e., 2 to 4 years) due to vegetative recovery, decreased soil hydrophobicity, and changes in soil surface textures (Legleiter et al. 2003). During these periodic events, affected drainages may produce visibly turbid water during each heavy storm or snowmelt event. Landslides, however, may occur several years after a severe fire (Wondzell and King 2003). The lag is largely due to the relatively slow decay of roots of fire-killed trees and shrubs. Once these anchors are lost, the soil is more likely to slough from steep slopes when saturated with rainfall or snowmelt.

Mass wasting (i.e., debris torrents, landslides, and movement of unstable earthflow terrains) following a fire can transport tremendous amounts of sediment and wood debris to stream channels. Reeves (1996, cited in the Catching-Beaver Watershed Assessment) observed that mass wasting following fire can deposit so much material that 2 or 3 m of accumulated sediment and coarse debris can still remain in the channel 100 years after the depositional event. Many terrace-like features next to mountain streams in the Pacific Northwest are relic depositions of debris avalanche–transported material through which streams subsequently down cut to new grade controls. Small, third- to fifth-order forested streams are in close proximity to sediment sources (adjacent hillslopes and channel banks). Large woody debris (LWD) and boulders form persistent structures that trap significant volumes of sediment in these channels, reducing sediment transport in the short term and substantially increasing channel stability. External sediment inputs such as mass wasting and bank collapse along with wood accumulation tend to dominate channel morphology of smaller streams, while larger streams are primarily influenced by downstream fluvial sediment transport and bank erosion. Bed material transport occurs under relatively high flow conditions for a very short period of time. Since major erosional events are almost always associated with excessive amounts of precipitation, their occurrence depends on these storms occurring during periods of increased susceptibility to surface erosion and mass wasting following intense wildfire (Wondzell and King 2003).

The effects of these disturbances on sediment flux can range from increases in sediment transport in streams to mass wasting events that impact riparian vegetation at the site. At the subwatershed scale, these events often deposit large amounts of sediment and LWD in and adjacent to stream channels. These sediment pulses occurred infrequently at any given site or subwatershed and affected a relatively small portion of the watershed at any one time, although at the watershed or regional scale, disturbance processes were (and are) a constant factor in Pacific Northwest landscapes. Disturbances resulting in sediment pulses generally allow ecosystems to remain within their normal historical range of states and conditions since there is sufficient time between disturbances to enable ecosystems to recover to predisturbance conditions (Everest and Reeves 2007, p. 19).

The large-scale ecological structure, function, and processes that shaped Pacific Northwest watersheds have been substantially altered by anthropogenic factors (e.g., fire suppression, timber management). Fire suppression has altered the historical frequency and intensity of fire events in the Pacific Northwest. As result of fire suppression and timber management, there has been a general shift in vegetation patterns, structures, and ecological processes from relatively larger patches of late-successional and old-growth forest (LSOG) with frequent low-intensity fires to more fragmented landscapes that are dominated by early- and mid-seral plant communities. Large, high-intensity fires do occur (e.g., the Biscuit Fire in 2003), possibly with increasing frequency and intensity. In the past, forest practices (timber harvest) in the Pacific Northwest increased mass wasting events and sediment yields. Road-related mass wasting is a major source of sediment (Hassan et al. 2005). Land use patterns and, in particular, forest roads have altered sediment and flow regimes in many stream networks, replacing episodic pulses of coarse sediments with chronic delivery and deposition of fine sediments.

2.1.3 Klamath-Siskiyou Province, MP 47–105, 118–153

The Klamath-Siskiyou Province encompasses the Klamath and Siskiyou Mountains and lies between the Coast Range and Cascades, south of the Willamette Valley. The PCGP project would traverse the northeast corner of the Klamath-Siskiyou Province for approximately 93 miles (figure 2-1). It includes parts of the Umpqua and Rogue River National Forests and is typified by deeply dissected valleys and jutting ridges and foothills. Much of this province lies within a rain shadow, sheltered from the Pacific maritime influences by the Coast Range. The region has a rugged landscape, with high peaks and deep canyons. Elevations range from about 1,000 to 5,000 feet above mean sea level (msl). Portions of the South Umpqua, Elk Creek–South Umpqua, Upper Cow Creek, Trail Creek, Shady Cove–Rogue River, Big Butte, and Little Butte Creek fifth-field watersheds are in the Klamath-Siskiyou Province.

2.1.3.1 Landform and Erosional Processes

The Klamath-Siskiyou province is rugged and deeply dissected. Tributary streams generally follow the northeast-southwest orientation of rock structure created by accretion of rocks onto the continent. Variable materials juxtapose steep slopes subject to debris flows and gentle slopes subject to earthflows. Scattered granitic rocks are subject to debris flows and severe surface erosion. High rates of uplift have created steep streamside hillslopes known as inner gorges, especially near the coast.

The Klamath-Siskiyou Province is known for its highly complex geology. Most of the area is composed of highly deformed volcanic and marine sedimentary rocks with some metamorphic terranes. It also includes deformed pieces of oceanic crust and granitic intrusive bodies. Bedrock is often intensely metamorphosed and fractured. Well-developed floodplains and terraces near major rivers give way to highly dissected mountains with high-gradient streams. Many streams in this province have intermittent flows because of high gradients and low summer precipitation.

In this province, erosional processes are dominated by mass wasting–associated high-intensity rainfall events, as well as rain-on-snow events in the higher elevations. Erosional processes would be accelerated where these events overlap with large, stand-replacing fires. Precipitation gradients decrease from west to east, so landslide frequency decreases with decreased precipitation. Hydraulic mining that occurred in the 19th century dramatically altered landscapes and downstream channels where this activity occurred.

2.1.3.2 Climate

The valleys and foothills of the Klamath-Siskiyou Province experience a Mediterranean-type climate, while the higher elevations demonstrate more montane effects. Precipitation in the lowlands ranges from 25 to 50 inches per year, while higher elevations may receive up to 130 inches per year. Areas outside the Coast Range rain shadow receive considerably more precipitation. Most precipitation falls as rain and snow during the winter, though summer thunderstorms may produce measurable amounts. Average December temperatures range from 35°F to 49°F, while average August temperatures range from 50°F to 90°F.

2.1.3.3 Vegetation

This province is dominated by mixed-conifer and mixed-conifer/hardwood forests. Land ownerships include a mixture of BLM, NFS, state, and private lands. The forests are highly fragmented by natural factors (e.g., poor soils, dry climate, wildfires) and human-induced factors (e.g., timber harvest, roads). Much of the historical harvest in this province has been selective cutting rather than clearcutting. As a result, many stands that were logged in the early 1900s include a mixture of old trees left after harvest and younger trees that regenerated after harvest. Much of the area within the province is characterized by high fire frequencies and stand-replacing fires. Any plan to protect LSOG forests in these areas must include careful consideration of fire management.

2.1.4 Cascades Province MP 105–113

Approximately 13 miles of the pipeline corridor that crosses the Umpqua National Forest is within the north-south trending Western Cascades Province (figure 2-1). This province, which drains westward to the Pacific Ocean, reaches elevations of 5,800 feet above msl. Portions of the Upper Cow Creek and Trail Creek fifth-field watersheds are in the Cascades Province.

2.1.4.1 Landform and Erosional Processes

The landforms in the Western Cascades Province are distinguished from the High Cascades Province by older volcanic activity and a longer glacial history. Ridge crests at generally similar elevations are separated by steep, deeply dissected valleys. Complex volcanoclastic formations juxtapose relatively stable volcanic deposits that weather to thick soils and are subject to earthflows. Unconsolidated alluvial and glacial deposits are subject to streambank erosion and landslides. Tributary channels flow at large angles into wide, glaciated valleys. Stream gradients are typically moderate to high (2 to 30%).

2.1.4.2 Climate

Lowland areas may receive as little as 60 inches of precipitation per year while higher elevations may receive up to 120 inches annually. Much of the precipitation that falls above 4,000 feet msl is snow. Average January temperatures range from 26°F to 41°F, while average July temperatures range from 44°F to 78°F.

2.1.4.3 Vegetation

Forests of this province consist primarily of Douglas-fir and western hemlock at lower to middle elevations. Land ownership includes a mixture of private, state, NFS, and BLM lands. The Forest Service administers extensive areas in the province. Private and state lands in this area are managed intensively for timber production under the forest practice and water quality laws of the State of Oregon and are primarily early- and mid-seral forests, whereas federally administered lands still include significant areas (albeit highly fragmented) of LSOG forest. Forests at the southern section of the province have been largely replaced by mixed-conifer forests of Douglas-fir, grand fir, and incense-cedar. A large proportion of the known northern spotted owl population in Washington and Oregon occurs in the Western Cascades.

2.1.5 High Cascades Province MP 153–180

Approximately 23 miles of the proposed PCGP corridor would be located in the High Cascades Province (figure 2-1), crossing portions of the Rogue River National Forest and the Klamath Falls Resource Area of the BLM Lakeview District. This province is associated with a north-south trending mountain chain that drains both westward to the Pacific Ocean and eastward into the Klamath and Columbia basins (figure 2-1). The High Cascades Province reaches a peak elevation of 9,493 feet msl at the summit of Mt. McLoughlin. Portions of the Little Butte Creek, Spencer Creek, and Mills Creek–Lost River fifth-field watersheds are in this province.

2.1.5.1 Landform and Erosional Processes

The province consists of young to relatively recent volcanic landforms with varying degrees of glaciation. Lava flows form relatively stable plateaus, capped by the recent Cascades volcanoes. Drainages are generally not yet well developed or otherwise disperse into highly permeable volcanic deposits. Geologically recent volcanic deposits (i.e., Mazama ash and pumice) are subject to large debris flows when saturated by snowmelt. This province is composed primarily of approximately 3 million-year-old volcanic material, primarily andesite and basalt, that was subsequently glaciated. Mountains in this province are moderately dissected. Headwater streams have medium to high gradients and are often associated with large meadow-spring complexes such as Buck Lake in the Spencer Creek drainage. Expansive pumice plateaus associated with the eruption of Mt. Mazama about 5,000 years ago (Dead Indian Plateau, Clover Creek) with droughty soils characterized by high snowmelt infiltration and low summer water retention fill valley floors adjacent to volcanic peaks.

2.1.5.2 Climate

The High Cascades Province is climatically diverse, with mild valleys, snowy mountains, and alpine conditions at the highest elevations. Precipitation ranges from 45 to 100 inches per year and is largely associated with orographic influences of the mountains in this province. In the lowlands, average January temperatures range from 30°F to 45°F while average July temperatures range from 49 to 85°F. At higher elevations, average January temperatures range from 23 to 37°F, while average July temperatures range from 44°F to 74°F.

2.1.5.3 Vegetation

This province is dominated by mixed-conifer and ponderosa pine forests at mid to lower elevations and by true fir forests at higher elevations. The higher elevations of the High Cascades Province support forests of silver fir and mountain hemlock. Crater Lake National Park and several wilderness areas within this province include significant areas of mid-elevation LSOG forest. Land ownership patterns include a mixture of NFS, private, state, American Indian, National Park Service, and BLM lands. Forests in this region are highly fragmented due to a variety of natural factors (e.g., poor soils, high fire frequencies, high elevations) and human-induced factors (i.e., clearcutting and selective harvest). Before the advent of fire suppression in the early 1900s, wildfires played a major role in shaping the forests of this region. Intensive fire suppression efforts in the last 60 years have resulted in significant fuel accumulations in some areas and shifts in tree species composition. These changes may have made forests more susceptible to large high-severity fires and to epidemic attacks of insects and diseases. Any plan to protect LSOG forests in this area must include considerable attention to fire management and to the resilience of forest stands.

2.2 NATIONAL FOREST SYSTEM BASINS AND WATERSHEDS CROSSED BY THE PROJECT

The proposed PCGP project crosses 19 fifth-field watersheds in four river basins that lie in portions of the Coast Range, Klamath-Siskiyou, Western Cascades, and High Cascades aquatic provinces. Watersheds and river basins may lie in one or more aquatic provinces. A total of nine fifth-field watersheds that contain NFS lands are crossed by the project; the proposed pipeline crosses NFS lands in six of these. The ACS applies to this project only in these six fifth-field watersheds (table 2-2 and figure 2-1).

Of the total 231.83 miles of the proposed corridor, 30.73 miles (13.25%) would be on NFS lands. Three National Forests (Umpqua, Rogue River, and Winema) would be crossed by the project along with a combination of BLM administrative units, lands managed by the Bureau of Reclamation, and state and private lands. Watersheds in which the proposed pipeline does not cross NFS lands are not subject to the conditions of the ACS and are therefore not discussed in detail in this report. Table 2-2 summarizes the NFS administrative units crossed by the project by fifth-field watershed:

- In 11 watersheds, generally west of the South Umpqua River, BLM lands would be crossed, but no NFS lands would be affected by the project. These watersheds are not analyzed in this report.
- NFS lands would be crossed in the Days Creek–South Umpqua, Elk Creek–South Umpqua, Upper Cow Creek, Little Butte Creek, and Spencer Creek Key Watersheds. The Trail Creek watershed also has NFS lands that would be crossed by the project, but Trail Creek is not designated as a Key Watershed.

TABLE 2-2

Provinces, River Basins, and Watersheds on NFS Lands Subject to the ACS

Province	River Basin	Fifth-Field Watershed	Hydrologic Unit Code	Key Water-shed	Total Miles All Owners	Umpqua NF Miles	Rogue River NF Miles	Winema NF Miles	Total Forest Service Miles
Klamath Siskiyou	Umpqua	Days Cr.– S. Umpqua	1710030205	Yes	19.15	1.56	0.00	0.00	1.56
Klamath Siskiyou – Western Cascades	Umpqua	Elk Cr.– S. Umpqua	1710030204	Yes	3.26	2.67	0.00	0.00	2.67
Klamath Siskiyou – Western Cascades	Umpqua	Upper Cow Cr.	1710030206	No	5.27	4.50	0.00	0.00	4.50
Western Cascades	Upper Rogue	Trail Cr.	1710030706	No	10.68	2.09	0.00	0.00	2.09
Western Cascades – High Cascades	Upper Rogue	Little Butte Cr.	1710030708	Yes	33.05	0.00	13.87	0.00	13.87
High Cascades	Upper Klamath	Spencer Cr.	1801020601	Yes	15.13	0.00	0.00	6.05	6.05
Total Project Miles Where the ACS Applies					**—**	**9.82**	**13.87**	**6.05**	**30.74**

Table 2-3 shows the acres affected by the project right-of-way on NFS lands by land allocation. Approximately 608 acres of NFS land are within the project right-of-way. On NFS lands, all Late Successional Reserves (LSR) in the project right-of-way are in designated (mapped) LSRs.

TABLE 2-3

Fifth-Field Watersheds and Land Allocations Crossed by the Pacific Connector Gas Pipeline Corridor ROW on NFS Lands

	Designated LSR b/				**Matrix**				**Riparian Reserves b/**			
	Project Area (acres)		**% of Total LSR on NFS Land**		**Project Area (acres)**		**% of Total Matrix on NFS Land**		**Project Area (acres)**		**% of Total Riparian Reserves on NFS lands**	
Unit	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**
Days Cr.–S. Umpqua	**9.81**	**18.55**	**0.35**	**0.66**	**11.01**	**13.03**	**2.84**	**3.36**	**0.15**	**1.56**	**0.02**	**0.16**
Elk Cr.–South Umpqua	**21.23**	**0.00**	**0.15**	**0.00**	**7.43**	**1.20**	**0.04**	**0.01**	**0.54**	**0.00**	**<0.01**	**0.00**
Upper Cow Creek	**36.70**	**0.00**	**1.56**	**0.00**	**37.05**	**1.34**	**0.19**	**0.01**	**10.00**	**0.26**	**0.13**	**<0.01**

TABLE 2-3

Fifth-Field Watersheds and Land Allocations Crossed by the Pacific Connector Gas Pipeline Corridor ROW on NFS Lands

	Designated LSR b/				**Matrix**				**Riparian Reserves b/**			
	Project Area (acres)		**% of Total LSR on NFS Land**		**Project Area (acres)**		**% of Total Matrix on NFS Land**		**Project Area (acres)**		**% of Total Riparian Reserves on NFS lands**	
Unit	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**
Trail Creek	0.00	0.00	0.00	0.00	**41.28**	**8.99**	**1.05**	**0.23**	**0.00**	**0.00**	**0.00**	**0.00**
Little Butte Creek	**208.13**	**71.53**	**0.39**	**0.14**	**0.00**	**0.00**	**0.00**	**0.00**	**7.66**	**2.56**	**0.09**	**0.03**
Spencer Creek	**0.00**	**0.00**	**0.00**	**0.00**	**71.06**	**10.05**	**0.70**	**0.10**	**8.63**	**1.35**	**0.52**	**0.08**
Total	**257.87**	**90.08**	**0.36**	**0.12**	**167.83**	**24.61**	**0.57**	**0.12**	**26.98**	**5.73**	**0.05**	**0.01**

Source: Appendix F.4, table 2-3
a/ All data derived from Stantec-based GIS layers.
b/ Includes mapped and unmapped LSR on NFS lands.
c/ Riparian Reserve acres overlap with LSR and Matrix land allocations.

LSRs are an important component of the ACS because the standards and guidelines under which LSRs are managed provide additional protection for aquatic resources (Forest Service and BLM, 1994b: B-12). The South Umpqua watershed is a Key Watershed. On NFS lands, five of the fifth-field watersheds have mapped LSRs[9] crossed by the project right-of-way. Of these five, by far the most affected is the Little Butte Creek watershed (13.7 miles, 274.76 acres), followed by the Upper Cow Creek watershed (2.23 miles, 36.58 acres), Elk Creek–South Umpqua River watershed (1.98 miles, 21.23 acres), and Days Creek–South Umpqua River watershed (0.8 mile, 28.36 acres). Unmapped LSRs associated with known owl activity centers (KOACs) are crossed only in the Upper Cow Creek watershed.

Matrix land would be affected in five fifth-field watersheds where the ACS applies. The most affected watershed is the Spencer Creek watershed (5.33 miles, 81.11 acres affected); the watershed with the least affected matrix land is the Elk Creek South Umpqua River watershed (0.68 mile, 8.63 acres affected). Riparian Reserves would be affected in five fifth-field watersheds where the ACS applies: the Elk Creek–South Umpqua River, Days Creek–South Umpqua River, Upper Cow Creek, Little Butte Creek, and Spencer Creek watersheds (table 2-3). Acreages of affected Riparian Reserves on these watersheds range from 0.54 acre in Elk Creek South Umpqua to 10.35 acres in Upper Cow Creek.

2.2.1 Umpqua River Basin

2.2.1.1 Geographic Setting

The Umpqua River Basin is flanked in the north by the Siuslaw and Willamette River basins, in the east by the Deschutes and Klamath River drainages, and in the south by the Rogue and Coquille River basins. The basin is bounded on the south by the Klamath Mountains and transects the Coast Range before entering the Pacific Ocean (figure 2-1).

The mainstem Umpqua River begins about 110 miles from its mouth at the confluence of the North and South Umpqua rivers near the city of Roseburg The Umpqua River drains

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[9] Mapped LSRs are definitive land allocations established for NFS lands in the NWFP ROD. Each one has a numerical identifier.

approximately 4,670 square miles of western Oregon, with headwaters in the Cascades Range and Klamath Mountains before traversing the Coast Range and entering the Pacific Ocean through Winchester Bay at Reedsport. The estuary of the Umpqua River is one of largest on the Oregon coast, with tidewater extending as far inland as Scottsburg, Oregon, at river mile 27.9.

The North Umpqua River drains 1,359 square miles, with headwaters in the High Cascades Province. The South Umpqua River drains part of the northern Klamath-Siskiyou Mountains Province and portions of both the Western Cascades and High Cascades provinces. Upstream of its confluence with the North Umpqua River, the South Umpqua River has a drainage area of about 1,800 square miles. All the watersheds crossed by the project in the Umpqua Basin lie in the South Umpqua Subbasin, which is within the Klamath-Siskiyou, Western Cascades, and High Cascades provinces. The portion of the Pacific Connector pipeline subject to the ACS crosses on to NFS lands in the Days Creek–South Umpqua fifth-field watershed at approximately MP 100 near Tiller, Oregon. From there, the Pacific Connector route travels generally south, primarily along ridge tops through the Elk Creek–South Umpqua and Upper Cow Creek fifth-field watersheds before entering the Trail Creek watershed in the Upper Rogue River Basin near MP 111.

2.2.1.2 Climate and Hydrology

The Umpqua River Basin is characterized by a temperate, maritime climate with mild, wet winters and moderately dry, warm summers. Because the Umpqua River begins at high elevations in the Cascades Range, it receives a heavier snowpack than coastal rivers with headwaters at lower elevations. Most precipitation in the basin falls in the winter and varies from around 30 inches in interior valleys to over 80 inches per year in the upper elevations.

Both the North and South Umpqua rivers subbasins are characterized by rugged topography, with steep canyons and rapid elevation changes associated with volcanic activity, combined with periodic glacial episodes. Shallower and rockier soils, which characterize the South Umpqua River Subbasin, release runoff quickly. Consequently, winter runoff dominates the hydrology in the South Umpqua Subbasin. High winter runoff results in scouring events and high-intensity, short-duration flood flows like those in 1955 and 1964, which occurred when warm rains and condensation melted a deep snowpack. In the South Umpqua River Subbasin, Galesville Reservoir was constructed in the upper Cow Creek drainage in 1985 to reduce flooding along the lower reaches of Cow Creek. Although Galesville Reservoir has a pronounced effect on peak flows in Cow Creek downstream, peak flows farther downstream on the South Umpqua River near Brockway have not shown a marked decline in peak flows since dam construction.

Total Maximum Daily Load (TMDL) thresholds and a Water Quality Restoration Plan (WQRP) were established for temperature and other pollutants for the Umpqua River Basin in 2006 (https://www.oregon.gov/deq/FilterDocs/umpexecsumm.pdf).

2.2.1.3 Days Creek–South Umpqua River Fifth-Field Watershed, HUC 1710030205

Overview

The portion of the Days Creek–South Umpqua River watershed crossed by the project is a Tier 1 Key Watershed (see section 1.1.3). Key Watersheds contribute directly to conservation of at-risk anadromous salmonids and resident fish species by providing high-quality habitat. A network of

Tier 1 Key Watersheds ensures that refugia for at-risk species are widely distributed across a landscape to provide requisite connectivity.

Originating in the Cascades Range, the 221.2-square-mile (141,569-acre) Days Creek–South Umpqua River watershed is one of 13 fifth-field watersheds constituting the South Umpqua Subbasin, which drains about 1,800 square miles of southern Oregon. Located about 20 miles southeast of Roseburg in the southeast portion of the Umpqua National Forest (Tiller Ranger District), the watershed is bordered on the north by the Myrtle Creek fifth-field watershed and on the south by the Upper Cow Creek and Elk Creek–South Umpqua River fifth-field watersheds, all of which are partly traversed by the project (figure 2-2). Just west of Roseburg, Oregon, the South and North Umpqua rivers join to form the Umpqua River, which flows northwest through the Oregon Coast Range and empties into the Pacific Ocean at Winchester Bay. See figure 1-1 for the regional setting of this watershed and its relationship to the other fifth-field watersheds traversed by the project.

Logging, agriculture, mining, transportation, and residential areas dominate human land use in the watershed. The communities of Canyonville, Days Creek, Milo, and Tiller are located within or in close proximity to the boundary of the Umpqua National Forest in the watershed. Interstate 5 runs north-south through the watershed, and the Tiller-Trail Highway follows the South Umpqua River east from Canyonville, Oregon.

The geology of the Days Creek–South Umpqua River watershed includes sedimentary, igneous, metamorphic, and volcanic rocks of the Western Cascades and Klamath-Siskiyou provinces[10]. Soils from metamorphic parent materials cover about 57% of the watershed (metamorphic rock is mapped as 44% of the watershed, and mica schist, a type of metamorphic rock, is mapped as 13%), while granodiorite parent material, an igneous type of rock, covers 23% of the watershed. The remaining 20% is composed of sedimentary rock (i.e., siltstone to conglomerate). Both the granodiorite and mica schist soils have high erosion potential when bare.

Elevations in the watershed range from about 640 feet where Cow Creek flows into the South Umpqua River in the northwest part of the watershed to about 4,040 feet at the headwaters of Days Creek in the northeast part of the watershed. Fifty-two percent of the watershed lies at elevations lower than 2,000 feet above mean sea level (amsl).

The Days Creek–South Umpqua River watershed has a Mediterranean-type climate, with cool, wet winters and hot, dry summers. Annual precipitation ranges from about 30 inches at Canyonville in the lower part of the watershed to more than 60 inches at the highest elevations. About 85% of the precipitation falls from October through April. At the highest elevations, a substantial portion of the precipitation falls as snow. Summer rainfall is typically less than 5 inches and is typically associated with high-intensity summer thunderstorms.

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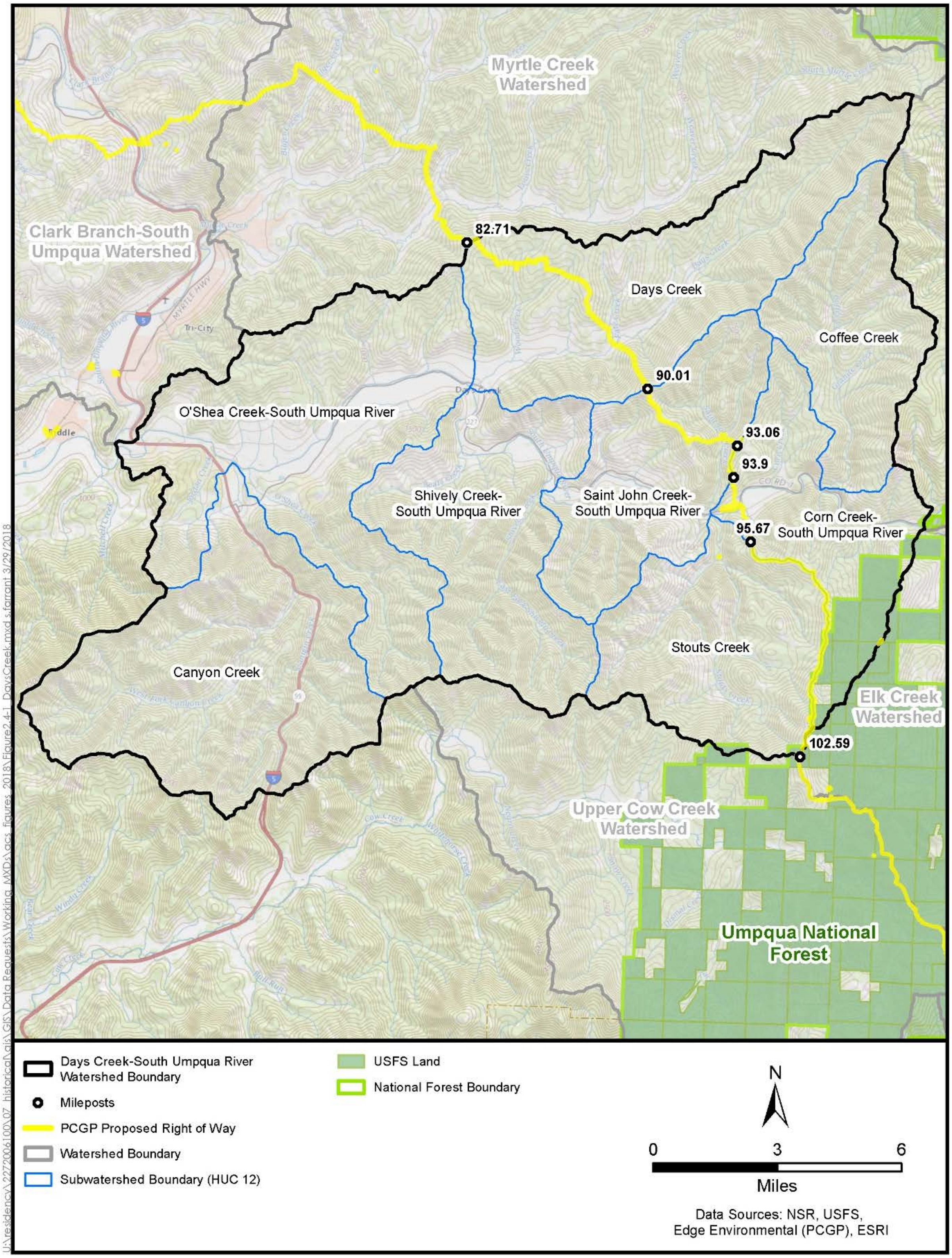
[10] Provinces discussed in this document are based on both ecological and geological conditions and therefore do not match those recognized by the Oregon Department of Geology and Mineral Industries and the Oregon State Board of Professional Geologists and Geophysicists. The Klamath-Siskiyou Province is known by professional geologists as the Klamath Mountains Province and the Western Cascades and the High Cascades are two mountain ranges within the Cascades Mountains Province. See https://www.oregongeology.org/learnmore/geologicsightseeing.htm

Figure 2-2 PCGP Routing and Subwatershed Boundaries, Days Creek–South Umpqua River Watershed



The watershed includes eight subwatersheds, four of which (Days Creek, Saint John Creek, Corn Creek, and Stouts Creek) are crossed by the project (figure 2-2). Approximately 2% (2,807 acres or 4.4 square miles) of the land in the watershed lies in the Umpqua National Forest and is managed by the Tiller Ranger District, 41% (57,997 acres or 90.6 square miles) of the land in the watershed is managed by the BLM Roseburg District (South River Field Office), and the rest of the land in the watershed (57.0%) has non-federal ownership. The forested lands on the private holdings are characterized by early- and mid-seral stages. Only 3% of these holdings are covered by forests with stands in excess of 80 years old. In this watershed, NFS land is found only in the Corn Creek and Stouts Creek subwatersheds (figure 2-2, table 2-4).

Fire severity is low for the Interior Valleys and Foothills Zone, low to moderate for the Douglas-fir/Chinkapin Zone, moderate for the Grand Fir zone, and high for the cool Douglas-fir/Hemlock and Western Hemlock zones (BLM 2001). High-severity regimes have infrequent fires but when they do occur, they are often intense and stand replacing.

The Days Creek–South Umpqua River watershed contains approximately 1,407 miles of streams. Headwater areas, like much of the NFS land in the watershed, are dominated by dendritic drainage patterns with 1st and 2nd order streams comprising most of the stream miles in the watershed. The term dendritic represents a drainage pattern similar to the pattern made by the veins (i.e., dendritic) on deciduous tree leaves. This type of drainage pattern is found when a common rock type dominates the drainage (e.g., metamorphic rock). Stream drainage densities in the entire watershed average about 6 miles/square mile. These relatively high densities indicate that streamflow responds relatively quickly to rainfall runoff events, possibly contributing to high flows and channel erosion.

Closely following rainfall amounts, the vast majority of the streamflow occurs from November through May, with a maximum in January. Small upland intermittent tributaries characteristic of the areas through which the project crosses are typically dry in the mid-summer period. About 14% of the watershed is in the transient snow zone (TSZ). Drainages with high road densities, high stream crossing densities, >25% in the TSZ, and a large percentage of land covered by early-seral forests may be susceptible to increased peak flows.

Winter steelhead and resident rainbow trout, fall and spring Chinook salmon, coho salmon, and sea-run cutthroat and resident cutthroat trout have historically used streams in the watershed. Several of these species are listed by the National Marine Fisheries Service (NMFS) under the Endangered Species Act of 1973. Approximately 145 miles of streams in the watershed are considered to be fish-bearing, and 93 miles are considered to be anadromous fish-bearing streams. Poorly designed or damaged culverts as well as dams without functional fish passage structures prevent upstream fish migration in numerous streams.

NFS lands make up 2% of the total land within the Days Creek–South Umpqua River watershed, with 86% (2,417 acres or 3.8 square miles) of these lands mapped as LSR[11] (RO223). There are approximately 981 acres of Riparian Reserves on NFS lands. NFS lands occur primarily in the upper reaches of the watershed.

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[11] Late Successional Reserves (LSR) values apply only to NFS lands.

Location and Routing

The project enters the Days Creek–South Umpqua River watershed at MP 82.71 and travels in a south-southeasterly direction through the Days Creek, Saint John Creek, Corn Creek, and Stouts Creek subwatersheds. Between MP 101.77 and MP 102.59, the project right-of-way goes back and forth between the Days Creek–South Umpqua River watershed and the Elk Creek watershed before entering the Upper Cow Creek watershed (figure 2-2, table 2-5). The project right-of-way runs predominantly along ridge tops, particularly in the last segment, where it straddles the divide between the Corn Creek and Stouts Creek subwatersheds. In all, the project right-of-way traverses 19.15 miles of the Days Creek–South Umpqua River watershed, including 6.88 miles in the Days Creek subwatershed, 3.31 miles in the Saint John Creek subwatershed, 5.53 miles in the Corn Creek subwatershed, and 3.43 miles in the Stouts Creek subwatershed.

Within the watershed, 1.56 miles of NFS land are crossed by the project right-of-way. The only NFS lands crossed by the project are in the Corn Creek and Stouts Creek subwatersheds (figure 2-2, table 2-5). Approximately 28.35 acres of LSR on NFS lands (9.81 acres cleared and 18.54 acres modified) (see table 2-6) are in the project right-of-way in the Days Creek–South Umpqua watershed. All the designated LSR effects would be in the Corn and Stouts Creek subwatersheds and account for about 1% of the total LSR in the watershed. Approximately 24.04 acres of matrix[12] land would be affected by project construction, including 11.01 acres cleared and 13.03 acres modified (table 2-6).

Project effects on Riparian Reserves and associated aquatic and riparian-dependent resources are minimal considering the number of miles of the project right-of-way in the watershed. There are no stream channel crossings on NFS lands in the Days Creek–South Umpqua River watershed. Two ridge-top wetland seeps (CW056 and CW057) would be crossed at MP 102.18 and 102.24, respectively. Construction effects to Riparian Reserves in the Days Creek–South Umpqua River watershed total approximately 1.71 acres: 0.15 acres cleared and 1.56 acres modified (table 2-6).

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[3] Matrix is an NFS land allocation.

TABLE 2-4

Land Ownership and Forest Service Land Allocations (acres) in Days Creek–South Umpqua River Fifth-Field Watershed (HUC 1710030205)

	Land Ownership (acres)					Forest Service Land Allocation (acres)		
Sixth-Field Watershed	**Sixth-Field Watershed (acres) a/**	**NFS Land**	**BLM**	**Total NFS and BLM**	**Other**	**LSR**	**Riparian Reserves b/**	**Matrix**
Canyon Creek	24,173.64	0.00	13,395.08	13,395.08	10,778.56	0.00	0.00	0.00
Coffee Creek	11,335.74	0.00	6,709.57	6,709.57	4,626.17	0.00	0.00	0.00
Corn Creek–South Umpqua River	12,014.87	2,624.04	3,837.63	6,461.67	5,553.20	2,385.98	939.25	232.23
Days Creek	22,024.29	0.00	7,983.00	7,983.00	14,041.29	0.00	0.00	0.00
O'Shea Creek–South Umpqua River	26,490.27	0.00	5,342.13	5,342.13	21,148.14	0.00	0.00	0.00
Saint John Creek–South Umpqua River	13,835.72	0.00	6,046.98	6,046.98	7,788.74	0.00	0.00	0.00
Shively Creek–South Umpqua River	17,328.30	0.00	7,008.79	7,008.79	10,319.51	0.00	0.00	0.00
Stouts Creek	14,366.06	182.86	7,673.90	7,856.76	6,509.30	31.35	42.11	149.20
Watershed Total	**141,568.89**	**2,806.90**	**57,997.08**	**60,803.98**	**80,764.91**	**2,417.33**	**981.36**	**387.67**

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a/ All data derived from Stantec-based GIS layers.
b/ May occur within other NFS land allocations.

TABLE 2-5

Project Corridor (miles) and Project Area (acres) in Days Creek–South Umpqua River Fifth-Field Watershed (HUC 1710030205) by Land Ownership

	Land Ownership							
	NFS Lands				Entire Sixth-Field Watershed			
		Project Area (acres)				Project Area (acres) b/		
Sixth-Field Watershed a/	**Corridor Length (miles)**	**Cleared**	**Modified**	**% of NFS Land Impacted**	**Corridor Length (miles)**	**Cleared**	**Modified**	**% of Sixth-Field Watershed Impacted**
Canyon Creek	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coffee Creek	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corn Creek–South Umpqua River	0.93	7.60	16.09	0.84	5.53	78. 32	41.68	1.00
Days Creek	0.00	0.00	0.00	0.00	6.88	109.07	123.16	0.01
O'Shea Creek–South Umpqua River	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Saint John Creek–South Umpqua River	0.00	0.00	0.00	0.00	3.31	67.48	22.41	0.65
Shively Creek–South Umpqua River	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stouts Creek	0.63	13.39	15.76	1.04	3.43	67.20	39.46	0.74
Watershed Total	**1.56**	**20.99**	**31.85**	**1.13**	**19.15**	**322.07**	**226.71**	**0.39**

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a/ All data derived from Stantec-based GIS layers.
b/ Includes NFS, BLM, and other ownerships.

TABLE 2-6

Project Area (acres) on NFS Lands in the Days Creek–South Umpqua River Fifth-Field Watershed (HUC 1710030205) by Land Allocation

Sixth-Field Watershed a/	Designated LSR b/				Matrix				Riparian Reserves b/			
	Project Area (acres)		% of Total LSR on NFS Land		Project Area (acres)		% of Total Matrix on NFS Land		Project Area (acres)		% of Total Riparian Reserves on NFS lands c/	
	Cleared	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**
Canyon Creek	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coffee Creek	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corn Creek–South Umpqua River	3.48	10.53	0.14	0.43	4.10	5.48	1.77	2.36	0.00	0.20	0.00	0.02
Days Creek	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
O'Shea Creek–South Umpqua River	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Saint John Creek–South Umpqua River	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Shively Creek–South Umpqua River	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stouts Creek	6.33	8.02	0.26	0.33	6.91	7.55	4.63	5.06	0.15	1.36	0.02	0.14
Watershed Total	**9.81**	**18.55**	**0.35**	**0.66**	**11.01**	**13.03**	**2.84**	**3.36**	**0.15**	**1.56**	**0.02**	**0.16**

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a/ All data derived from Stantec-based GIS layers.
b/ Includes mapped and unmapped LSR on NFS lands.
c/ Riparian Reserve acres overlap with LSR and matrix land allocations.

Existing Conditions

Original Watershed Assessment Findings

The BLM, in consultation with the Umpqua National Forest, completed the Second Iteration Watershed Assessment for the Days Creek–South Umpqua River watershed in 2001 (BLM 2001). Subsequent review and assessment of the effects of the 2015 Stouts Fire has been included in this document with respect to NFS lands. Watershed conditions are summarized as follows:

- Timber harvesting and road construction over the past 60 years have had major effects in the watershed, including increased peak flows, accelerated sediment transport to streams, increase in landslide hazards, higher stream temperatures, reductions in aquatic habitat complexity and connectivity, and debilitating alterations to stream channel morphology (Beschta 1978, Harr and McCorison 1979, Jones and Grant 1996, Wemple et al. 1996, all cited in BLM 2001).

- Based on data from 2000 Operations Inventory Vegetation Data, 13% of the watershed was nonforested (mainly agriculture and pasture land with emphasis on livestock production), 18% was early seral (30 years old or less), 39% was mid-seral (31–80 years old), and 27% was late-seral (80 years old or older). About 84% was conifer forest and

3% was covered in hardwood-dominated forest. For BLM-administered lands[13], 1% was nonforest, 25% was early-seral forest, 16% was mid-seral forest, and 57% was LSOG forest (BLM 2001).

- On NFS lands, there are approximately 455 acres of Riparian Reserves associated with LSOG forest. Regardless, there are Riparian Reserves associated with streams throughout the watershed that have insufficient riparian growth and stream cover, ongoing bank erosion and channel instability, insufficient LWD, and elevated stream temperatures. This is particularly relevant to those Riparian Reserves and upland forest areas that were subjected to the Stouts Fire. The watershed assessment and subsequent recommendations for post-fire recovery after the Stouts Fire support the recommendations to manage fuel loading and reestablish native vegetation.

- Wildfires have had a major impact on the vegetation patterns in the watershed, creating a mosaic of species of varying sizes. The 1987 Canyon Mountain and Bland Mountain fires burned approximately 15,000 acres of the watershed, furthering the shift to early-seral forest that resulted largely from logging (BLM 2001). The 2015 Stouts Fire burned an additional 26,452 acres of the watershed, which has resulted in an increase of early seral forest. The Forest Service assigned a burned area emergency response (BAER) team to assess risk to resource conditions and identify the appropriate methods and costs for emergency 2-year funding for the burned area rehabilitation. Prescribed burns have been used extensively to prevent major fires and prepare the site for reforestation. The potential exists for additional large-scale fires in this watershed where fuel loads are excessive.

- On steeper slopes throughout the watershed, there are substantial areas susceptible to landslides when burned, cleared, or affected by road construction. Landslides associated with roads are a major source of sediment transport to downstream aquatic habitats in the watershed. This is due to road construction methods and maintenance. Road construction prior to 1970 used sidecast construction methods that commonly contained organic materials in the fill and the fill materials were not compacted at optimum density and moisture conditions. These older roads are usually the areas where watershed maintenance has been focused in the past due to their unstable construction.

- Road densities averaged 4.56 miles/square mile throughout the watershed, with most drainages having densities of less than 5.0 miles/square mile. Many of these roads are in need of maintenance and are a major source of elevated peak flows and sediment transport in the watershed (BLM 2001). These roads serve to substantially extend the stream network, thereby increasing peak flows and modifying sediment flux in the stream channels. This has, in turn, resulted in bank and channel erosion. Between 1997 and 2001, about 12 miles of roads in the watershed were improved and about another 4 miles were decommissioned; the recommendation is to improve and preferably decommission roads wherever possible. During and following the Stouts Fire, the BLM and Forest Service did conduct road maintenance and repair activities on a number of roads

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[13] Percentages of forest cover types on NFS lands are not presented due to the relatively small amount of NFS lands within the watershed.

throughout the watershed; however, subsequent storms impacted a number of these roads and the associated watershed conditions.

- Timber clearing in the TSZ could result in elevated peak flows during warm rain-on-snow events. Forty-eight percent of the watershed lies above 2,000 feet amsl.
- The South Umpqua River from its mouth to the headwaters is on Oregon's Final 1998 Water Quality Limited Streams 303(d) list for temperature. Tributaries, including Beals Creek, Days Creek, and Shivley Creek, were on the water-quality limited list for habitat modification (including lack of LWD and pool frequency), while Fate Creek, Stouts Creek, and the East Fork of Stouts Creek were listed for temperature. The South Umpqua River was listed for toxics, flow modification, aquatic weeds or algae, bacteria, dissolved oxygen, sediment, pH, and temperature.
- Based on an ODFW Aquatic Habitat Inventory of 82 stream reaches in the watershed, only three were in good condition, 57 were rated as fair, and 22 were in poor condition. None were rated as being in excellent condition (BLM 2001, p. 169).
- Past removal of LWD and boulders from streams in the watershed as part of area logging operations has resulted in decreased habitat complexity, reduced sediment holding capacity, and resulted in higher flood peaks. It is recommended that restoration efforts be undertaken to address this issue throughout the watershed.
- Numerous culverts are faulty or are inadequate to handle large floods, resulting in blockage of passage of fish and other aquatic organisms through the area. It is recommended that these culverts be identified and repaired/replaced and that locations for other poorly designed or damaged culverts be identified.

Changes in Watershed Condition

Through July 2015, there were no large-scale disturbance events that would change the general conditions in the Days Creek–South Umpqua River watershed from those described in the applicable watershed assessment. A lightning storm caused the Stouts Fire to begin near the confluence of Stouts Creek and the South Umpqua River on July 30, 2015. This fire grew very quickly over the first several days and was not contained until early September 2015. Overall, the fire burned 26,452 acres of BLM, NFS, and private land and impacted resources associated with LSRs and Riparian Reserves. The fire burned across three subwatersheds that would be crossed by the project: Saint John Creek, Corn Creek, and Stouts Creek. Within these affected subwatersheds, 2,612 acres were burned on NFS land and 5,518 acres were burned on BLM land. The Forest Service BAER team identified issues from the fire involving seedling planting, noxious weeds, soil stabilization, road/trail water diversion, tree hazard removal, and monitoring. In November 2015, Stantec biologists, foresters, and geomorphologists conducted a field review of the burned area and surrounding watersheds. In conjunction with the data from the BAER reports, it was determined that the burn severity was moderate (25–50% of canopy cover mortality). The Stouts Fire Supplement to Appendix J of the 2019 Final EIS contains more details on the Stouts BAER report, as well the post-fire watershed projects that were implemented.

Prior to the Stouts Fire, the Forest Service and BLM had instituted a restoration program throughout the watershed based on recommendations from the 2001 watershed assessment in an attempt to improve conditions in specific stream reaches and subwatersheds. A wide array of restoration projects were completed between 2001 and 2015, including:

- Removal and modification of an old irrigation dam to enhance aquatic connectivity in Fate Creek.
- Streambank stabilization in Days Creek to reduce fine sediment and improve aquatic habitat.
- Replacement of stream crossings in several subwatersheds to improve water quality and enhance aquatic connectivity.
- Road decommissioning to reduce hydrologic connectivity and sediment delivery to streams.
- Placement of large wood in fish-bearing streams throughout the watershed to increase channel complexity and improve aquatic habitat.

Current Watershed Conditions

Watershed conditions have improved in the Days Creek–South Umpqua River watershed through accomplishment of restoration projects and implementation of the NWFP. BLM and Forest Service monitoring efforts indicated a trend of improvement of conditions in the Stouts Creek, Days Creek, and St. John Creek subwatersheds prior to the 2015 Stouts Fire. Insufficient information is available from after the fire to assess adverse conditions that persist in these subwatersheds; however, the 2015 BAER team report suggests that the high-intensity fire, coupled with extensive increases in sediment supply, was expected to degrade watershed conditions. Conversations with BLM and Forest Service hydrologists after the 2017 and 2018 winter storms confirm that stream crossings failed and high volumes of sediment were delivered to channels throughout the watershed.

Natural Disturbance Processes

Natural disturbance processes in the Days Creek–South Umpqua River watershed are typically associated with wildfires started by lightning strikes (e.g., 2015 Stouts Fire) and flood events (e.g., 2016 rain-on-snow floods). The severity of catastrophic fire hazards varies with the nature of the forest community, and the Days Creek–South Umpqua River watershed includes some areas of adverse consequences for severe, stand-replacing fires. In areas where fires have recently occurred, soils on steep slopes can become unstable from root loss and soil hydrophobicity and increasing landslide instability during heavy precipitation events. As a result of wildfires, a vegetation mosaic characterized by large blocks of vegetation of the same age class predominated under natural conditions, resulting in high connectivity in the terrestrial ecosystem. Under natural conditions, the peak flow conditions resulting from heavy rainfall would be ameliorated to a substantial degree by infiltration of much of the fallen water into the soil system. The subsequent slow release to the drainage system would not only dampen peak flows but also support base flow during the long dry season. The effects of peak flow events on the aquatic habitat under natural conditions were also mitigated by the complexity and hydraulic stability of the drainage network. Under natural conditions, LWD and boulders in the streams and active floodplain dynamics helped reduce peak flows and their effects on the aquatic ecosystem. Instream structure created pool habitats and substrate conditions conducive to spawning by anadromous and resident fish populations, and the absence of man-made obstructions (culverts and dams) facilitated access of fish populations to upstream habitats.

Project Effects and Range of Natural Variability

Table 2-7 describes the natural range of variability of five key ecological processes and project effects on these processes relative to the ranges of variability resulting from past and ongoing natural and human disturbances in the watershed. All processes have been affected to some degree by human activity.

Current watershed conditions do not reflect natural ranges of variability of key ecological processes in the Days Creek–South Umpqua River watershed. The South Umpqua watershed assessment documented that, historically, the watershed was about 85% LSOG forest (BLM 2001, p. 76). At the time of the 2001 watershed assessment, approximately 58% (35,540 acres out of 60,812 acres) of the federally administered land in the South Umpqua River watershed was in forest stands at least 80 years old (late successional) (BLM 2001, p. 76). The project affects approximately 2.2% of NFS lands, 0.31% of BLM lands, and 0.51% of all ownerships within the watershed. This small impact area is well within the scale of natural disturbance processes described by Everest and Reeves (2007) and Agee (1993) for the Coast Range and Klamath-Siskiyou Province as well as the South Umpqua watershed assessment and is unlikely to change the watershed condition.

The historical condition of the riparian zone along the upper South Umpqua River favored conditions typical of old-growth forests found in the Pacific Northwest (Roth 1937, cited in BLM 2001). Roth noted the shade component that existed along the surveyed stream reaches. The majority of the stream reaches surveyed were "arboreal" in nature; arboreal means having "tall timber along the banks, shading most of the stream." The river and its tributaries were well shaded by the canopy closure associated with mature trees. Streambanks were provided protection by the massive root systems of these trees (Roth 1937, cited in BLM 2001: 164).

Effects to Riparian Reserves are minor. Two forested wetlands in a ridge top swale on the hydrologic divide with the Elk Creek–South Umpqua watershed would be crossed. About 1.71 acres of Riparian Reserves located adjacent to these two isolated forested wetlands, which would likely be dry during construction, would be impacted. Approximately 0.37 acre of affected Riparian Reserves would be LSOG forest and 1.34 acres would be mid-seral. Crossings on BLM and private lands would use BMPs that are expected to be effective at minimizing sediment transport. Off-site mitigation measures, which include road upgrades/stabilization and culvert replacement, would help bring erosion processes, stream flow, and aquatic connectivity closer to the natural ranges of variability.

TABLE 2-7

Project Effects and Relevant Ecological Processes Described in the Days Creek–South Umpqua River Fifth-Field Watershed Assessment

Ecological Processes Relevant to the Project	**Historic Range of Variability**	**Pacific Connector Effects**
Erosional Processes	Landslides are a dominant sediment delivery geomorphic process for stream systems in the watershed under natural conditions. Historically, shallow landslides were associated with high-intensity rainfall events that overlapped with infrequent high-intensity fires. Slope movement of deep-seated landslides are climate driven except on toes where debris flows and slides occur in response to fluvial undercutting. These events resulted in large depositions of coarse wood and coarse sediments to stream systems. Agricultural development on private lands and high road densities throughout the watershed have resulted in chronic fine-grained sediment becoming the primary sediment source. Roads, some affected by landslides, can be a chronic source of sediment transport to waterbodies. In some cases, culverts are undersized and plugged. Roads in the watershed have substantially extended the drainage system during storms, resulting in increased sediment transport and peak flows. Many exposed soils in the watershed are subject to rapid surface erosion during storm events, resulting in increased sediment loads in streams.	Landslide-prone areas have been avoided in routing of the project right-of-way. All areas crossed by the project are classified as having a very low to low risk due to the low probability of mass wasting movement and as having no significant consequences (Geoengineers 2009). The project right-of-way is generally located on ridge tops. Erosion control measures and BMPs would be implemented to minimize sediment transport off the project right-of-way and thereby reduce the landslide risk. Rapid revegetation of disturbed areas, encouraged by replanting with native species, is anticipated. As a result, sediment effects are expected to be minor, short-term, and well within the range of natural variability for the watershed. Road drainage, surface enhancement, and storm-proofing mitigation projects would likely reduce significant sources of sediments. Offsite fire suppression and fuels reduction mitigation projects in the watershed would help reduce the risk and probability of high-intensity, stand-replacing fire and associated sediment.
Ecological Succession/ Vegetative Condition	The watershed has been heavily affected by both aboriginal and contemporary human use. Before Euro-American settlement, the dominant factor affecting overall landscape patterns was wildfire, which created a complex mosaic of large, even-age stands with large numbers of snags and fire-maintained natural openings. Logging has greatly modified the seral composition of forests in the watershed, with increases in early- and mid-seral forests and extensive fragmentation of the forest stands.	The project would have minimal impact on vegetation in Riparian Reserves. A small amount of Riparian Reserves (1.71 acres), all located in ridge top areas and bordering intermittent streams, would be impacted.
Flow Regime	Surface water and groundwater flow regimes are directly related to topography and to the precipitation regime, which in this watershed largely involves rainfall. Under natural conditions, most of the rain falling in the watershed percolates into the soils, where its movement toward aquatic habitats may be delayed, depending on the groundwater regime. Large, high-intensity fires may create conditions that significantly increase flows, especially on steep terrain with shallow soils. Improperly designed roads may extend the drainage system and accelerate the transport of runoff to stream channels if proper drainage facilities are not constructed. Clearing of the TSZ in past and ongoing logging and road construction operations have likely contributed to increased peak flows during warm rain-on-snow events. Absence of LWD and boulders in streams also fosters increased peak flows.	Vegetative conditions may contribute to peak flows when more than 25% of a watershed is in the TSZ and is less than 30 years old, or where there has been extensive vegetation loss after a stand-replacing fire. The South Umpqua watershed assessment estimated that 94% of the NFS lands in the watershed are hydrologically recovered and unlikely to contribute to increases in peak flows (BLM 2001, p. C-3). The project affects less than 1% of the watershed and therefore would not cause conditions likely to increase peak flows. The limited scale of vegetative impact, project location on or near ridge tops, and limited connectivity to aquatic systems make it unlikely that the project would contribute to an increase in peak flows. Improvements to access roads identified in the Transportation Management Plan (TMP) attachment to the POD along with several off-site road improvement mitigation projects are intended to reduce road-related effects to flow regimes in the watershed and mitigate any project effects. The amount of project-related clearing in TSZ lands is small and should not contribute to elevated peak flows during warm rain-on-snow events. See FEIS, chapter 4.3.

TABLE 2-7

Project Effects and Relevant Ecological Processes Described in the Days Creek–South Umpqua River Fifth-Field Watershed Assessment

Ecological Processes Relevant to the Project	Historic Range of Variability	Pacific Connector Effects
Stream Temperature	In the absence of disturbance, pre-settlement water temperatures were likely below those currently experienced by streams in the watershed. Stand-replacing wildfires and human disturbance (mainly logging, particularly in riparian areas, and road construction) have increased exposure of watershed streams to sunlight, resulting in elevated water temperatures outside the natural range in a number of drainages (e.g., Fate Creek, Stouts Creek, and the East Fork of Stouts Creek). Absence of LWD in streams has also likely contributed to higher stream temperatures by reducing pool frequency and size and allowing streams to widen.	The small acreage of riparian vegetation to be cleared and modified during project construction is unlikely to have any effect on stream temperatures since no stream channels would be crossed or exposed to solar radiation. All riparian areas cleared in the watershed are at near-ridge top positions, and the intermittent streams draining them are dry during the critical summer period when elevated stream temperatures are a concern. Therefore, clearing of the isolated riparian areas near the top of ridges should have no effect on temperatures on water bodies downstream.
Aquatic Habitat and Stream Channel Complexity and Connectivity	Prior to human impact, beaver dams and high densities of LWD in log jams created complex channels and maintained pools in streams of the watershed. Water was stored in the channel and in the streambanks and floodplains as perched aquifers or as parts of deeper unconfined aquifers. Significant amounts of this water were slowly released during the summer, thereby sustaining flows. A combination of LWD and riparian vegetation indicated stable streambanks and channels that were relatively resilient during floods. Removal of LWD and inadequate sources of replenishment of LWD to the creek channels and riparian zones have substantially reduced the complexity of the stream channels, rendering them less suitable as aquatic habitat. The presence of poorly designed and faulty culverts restrict access of anadromous and resident fish populations to upstream habitat.	No LWD or boulders would be removed from streams during construction because there are no channel crossings in the watershed. The very limited effects to Riparian Reserves in the watershed would be mitigated by replanting with native vegetation. Therefore, no long-term effects to aquatic habitat are expected.

Compliance with Umpqua National Forest Land and Resource Management Plan

Table 2-8 provides Umpqua National Forest LRMP Standards and Guidelines relevant to the ACS that are applicable to NFS lands in the Days Creek–South Umpqua River watershed.

TABLE 2-8

Compliance with Umpqua National Forest LRMP Standards and Guidelines in the Days Creek–South Umpqua River Watershed

LRMP Standard/Guideline	Project Compliance
Riparian Reserves - Lands; LH-4	Terms and conditions to ensure compliance with ACS objectives in the Days Creek–South Umpqua River watershed have been incorporated into the POD prepared by the applicant in conjunction with the Forest Service and submitted as part of the right-of-way application. The POD includes 28 exhibits, including the Wetland and Waterbody Crossing Plan, the Erosion Control and Revegetation Plan, the Hydrostatic Test Plan, the Right-of-Way Clearing Plan, and the TMP, etc.

TABLE 2-8

Compliance with Umpqua National Forest LRMP Standards and Guidelines in the Days Creek–South Umpqua River Watershed

LRMP Standard/Guideline	Project Compliance
Riparian Reserves General Riparian Area Management; RA-4	Hydrostatic test and dust abatement water withdrawals would not compromise aquatic habitats during low-flow conditions in the Days Creek–South Umpqua River watershed because all such needs would be provided by municipal sources.
Riparian Reserves - Road Management; RF-2	No new project-related roads intersect Riparian Reserves in the Days Creek–South Umpqua River watershed.
Riparian Reserves - Road Management; RF-4	No new project-related road crossings of streams are proposed in the Days Creek–South Umpqua River watershed. Several existing crossings would be upgraded to minimize erosion potential and facilitate fish passage through the reach. Specific specifications in the TMP (see section 2.2.3 of the TMP and Exhibit F, section F.9.e of the Wetland and Waterbody Crossing Plan) require culvert and bridge replacements to meet agency standards and agency approval of plans.
Riparian Reserves - Road Management; RF-5	Road maintenance specifications in the TMP require implementation of T-831, T-842, T-811 and T-834, which are maintenance specifications designed to minimize sediment delivery to aquatic habitats. These specifications would be implemented during project construction in the Days Creek–South Umpqua River watershed.
Riparian Reserves - Road Management; RF-7	The TMP submitted by the applicant and accepted by the Forest Service meets all the requirements of RF-7 in the Days Creek–South Umpqua River watershed.
Riparian Reserves - watershed and Habitat Restoration; WR-3	Application of BMPs and other aggressive erosion control measures, restricted construction windows, and numerous other impact minimization measures have been incorporated into several exhibits to the POD to prevent habitat degradation in the Days Creek–South Umpqua River watershed. These measures are not being used as a substitute for otherwise preventable habitat degradation or as surrogates for habitat protection.
Management direction for Survey and Manage Species in the NWFP ROD was replaced by the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines as Modified by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.)	The project affects Survey and Manage species within the Days Creek–South Umpqua River watershed. This is not consistent with Management Recommendations in the 2001 Survey and Manage ROD; however, the project does not threaten the persistence of any Survey and Manage species (see appendix F.5). Waiving application of the Management Recommendations for Survey and Manage species in the watershed would not prevent attainment of any ACS objective.
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth-field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15% or less late-successional forest. (The assessment of 15% will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands. Protection of these stands could be modified in the future, when other portions of the watershed have recovered to the point where they could replace the ecological roles of these stands.	NFS lands in the Days Creek–South Umpqua River watershed are currently above this threshold.

The Days Creek–South Umpqua River watershed is a Key Watershed where special standards and guidelines apply on NFS lands. These are described in table 2-9.

TABLE 2-9

Project Consistency with Standards and Guidelines for Key Watersheds, Days Creek–South Umpqua River Watershed

Standard and Guideline	Project Consistency	Mitigation
Reduce existing system and nonsystem road mileage with no net increase in road miles.	No new roads would be constructed by the project. The construction road in the project right-of-way would be obliterated after construction.	None
No new roads would be constructed in inventoried Roadless Areas.	No part of the project is in an inventoried Roadless Area.	None
Watershed analysis must be completed prior to management activities	Watershed analysis has been completed for all watersheds crossed by the project right-of-way on Forest Service lands.	Off-site mitigation measures are consistent with watershed analysis recommendations.

Relationship of Proposed LRMP Amendment UNF-3 to the ACS

UNF LRMP IV-67-1, Forest-Wide Soils Standard and Guideline, states:

> The combined total amount of unacceptable soil condition (detrimental compaction, displacement, puddling or severely burned) in an activity area (e.g., cutting unit, range allotment, site preparation area) should not exceed 20%. All roads and landings, unless rehabilitated to natural conditions, are considered to be in detrimental condition and are included as part of this 20%.

Degraded soil conditions may occur in the cleared project areas. On NFS lands in the Days Creek–South Umpqua River watershed, approximately 38% (21 acres) of the project right-of-way would be cleared. Degraded soil conditions may result from displacement and compaction following completion of corridor construction and rehabilitation. Compaction can largely be addressed by subsoil ripping, but displacement would be unavoidable because of the nature of the project. Existing LRMP Standards and Guidelines allow up to 20% of the project right-of-way or 11 acres to result in a degraded soil condition on completion of a project. Thus, the proposed amendment allows an estimated 10 acres or 0.36% of NFS lands in the watershed to be in a degraded soil condition on completion of the project.

Severe disturbances such as soil mixing or displacement would reduce long-term site productivity by displacing the duff layer and soil surface (A horizon), thus reducing the soil's ability to capture and retain water and nutrients. As a result, sites with long-term detrimental soil conditions would have interrupted hydrologic function and poor site productivity. Compacted and/or displaced soils may increase runoff and sediment transport and have lower rates of vegetative recovery. Sites with long-term detrimental soil conditions would have interrupted hydrologic function and poor site productivity. Without mitigation, bare soil surfaces in granitic or serpentine soils can persist more than 50 years following a severe disturbance.

Environmental consequences associated with 10 acres of additional detrimental soil conditions over the project right-of-way in the Elk Creek–South Umpqua River watershed include:

- **A potential localized increase in sediment mobilization.** Pacific Connector selected the project route to avoid areas with a high likelihood of geologic hazards. No landslides have been identified that pose a threat to the project. The project does not cross earthflow (a type of landslide) terrains in the watershed. Effective erosion control measures and

BMPs are required, as shown in the ECRP. Additionally, the project would comply with the Umpqua National Forest LRMP Standards and Guidelines for maintenance of effective ground cover. As a result of the dispersal of effects by the linear nature of the project, maintenance of effective ground cover, required application of BMPs, lack of stream crossings, minimal effects to Riparian Reserves, and implementation of erosion control methods, it is highly unlikely that amending the Umpqua National Forest LRMP to exceed the soil disturbance thresholds by 10 acres would result in the mobilization of sediment that would change the existing equilibrium described in the South Umpqua watershed analysis.

- **A potential localized increase in peak flows.** The project would remove canopy on about 33.9 acres or about 0.9% of NFS lands in the Days Creek–South Umpqua River watershed. Analysis by FERC showed that the project was highly unlikely to contribute to increases in peak flows because of the small area affected by the project as a proportion of the watershed (FERC 2009). Additionally, the project would have minimal impacts to Riparian Reserves since it crosses two small forested wetlands, but no streams or rivers are crossed in the watershed on NFS lands. As a result, it is highly improbable that the project would change flow regimes from current conditions or from those described in the watershed analysis. See also the FEIS, chapter 4.3, for a discussion of peak flows.
- **A potential loss of site productivity, which may slow vegetative recovery.** Approximately 13% of the watershed contains mica schist and 23% contains granodiorite; both rock types have high erosion potential when bare. Mechanically decompacting the soil to a minimum depth of 20 inches and reestablishing soil organic matter would be a critical first step in rehabilitating the soil toward a more natural condition. Soil rehabilitation would also require recovery of the soil biology, which requires restoration of the soil organic matter and time. Pacific Connector would decompact the right-of-way, fertilize disturbed areas, reestablish native vegetation (limiting the area directly over the pipe to grasses and shrubs), and scatter slash and LWD across the site to provide for long-term nutrient cycling as required in the ECRP. Additionally, the Forest Service would require soil remediation with organic materials as necessary to restore biotic capacity.

Off-Site Mitigation

Off-site mitigation is intended to provide supplemental actions for project effects that cannot be completely mitigated onsite. All proposed off-site projects related to effects in the Days Creek–South Umpqua River watershed are located on NFS lands in the watershed (table 2-10).

Offsite mitigation efforts in Days Creek–South Umpqua River watershed are focused on:

- Snag creation to increase habitat within LSRs for Northern spotted owl
- Lupine meadow restoration
- Fuels reduction and other fire suppression actions (table 2-10).

TABLE 2-10

Proposed Off-Site Mitigation Projects for Days Creek–South Umpqua Watershed in the Umpqua National Forest

Mitigation Group	Project Type	Project Name	Project Rationale	Quantity
Terrestrial Habitat Improvement	Snag Creation	Days Cr.–South Umpqua Matrix Snag Creation	Mitigate immediate and future impacts to snag habitat from the clearing of the pipeline right-of-way. The project prevents development of large snags during the life of the project and for decades afterwards. Corridor construction will result in loss of snag habitat on approximately 775 acres of corridor construction (includes safety zone buffer). This project will add to those cumulative impacts. As snags are a critical component of LSR spotted owl habitat, replacement is needed. Snag requirements are specifically outlined in the Forest's LRMP and the NWFP. The Forest requires analysis and mitigation for most management activities. Replacement would be immediate, although there would be a 10-year delay as snag decay develops. Snag management is discussed in the NWFP for LSRs on pages C-14 and 15 of the ROD (items 4 and 7). Snag management levels are based on the Forest's Plant Association Guidelines. Snags are also discussed in the South Cascades LSR Assessment (chapter 3).	14 Acres
Terrestrial Habitat Improvement	Snag Creation	Days Cr.–South Umpqua LSR Snag Creation		32 Acres
Terrestrial Habitat Improvement	Lupine Meadow Restoration	Upper Cow Cr. Lupine Meadow Restoration	Mitigate impacts to unique habitats on NFS lands impacted by the project. There will be a loss of forest habitat buffering the unique habitats and disruption to soil horizons, enhancing the opportunities for nonnative plant species. These impacts cannot be fully mitigated on site; therefore, restoration activities such burning, removal of encroaching conifers, and noxious weed control would be applied to a 23-acre meadow located in LSR 223.	23 Acres
Stand Density Fuel Break	Fuels Reduction	Days Cr.–South Umpqua LSR Integrated Fuels Reduction	High-intensity fire has been identified as the single factor most impacting LSOG forest habitats on federal lands in the area of the NWFP. Construction of the pipeline and associated activities remove both mature and developing stands and will increase fire suppression complexity. However, the corridor will also provide a fuel break, and fuels reduction adjacent to the corridor will increase the effectiveness of the fuel break. Fuels reduction will lower the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire.	254 Acres
Stand Density Fuel Break	Fuels Reduction	Days Cr.–South Umpqua Matrix Integrated Fuels Reduction		194 Acres

Snag Creation: Snag creation projects are described in table 2-10; these projects are intended to mitigate for the loss of snag habitats within and adjacent to the project right-of-way. The creation of snags is important in providing habitat for northern spotted owl and other snag-dependent species. Over time, snags also provide LWD on the forest floor and lead to an increase in soil productivity. Snag management and creation as they relate to LSRs are discussed in the NWFP on pages C-14 and C-15 (Forest Service and BLM 1994b: C-14, C-15). Approximately 46 acres of snag creation would occur within the Umpqua National Forest.

Lupin Meadow Restoration: Lupin Meadow will be restored and future impacts will be mitigated to protect this unique habitat impacted by the project. There will be loss of forest habitat buffering this unique habitat and disruption to soil horizons, enhancing the opportunities for nonnative plant species. These impacts cannot be fully mitigated on site; therefore, restoration activities such as burning, removal of encroaching conifers, and noxious weed control would be applied to a 23-acre meadow located in LSR 223.

Fire Suppression: High-intensity fire has been identified as the single factor most impacting LSOG forest habitats on federal lands in the area covered by the NWFP. Construction of the pipeline and associated activities will remove both mature and developing stands and increase fire suppression complexity. However, the corridor will also provide a fuel break, and fuels reduction adjacent to the corridor will increase the effectiveness of the fuel break. Fuels reduction will lower the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire. Approximately 448 acres of fuel reduction projects on both LSR and matrix lands in the Umpqua National Forest have been proposed.

Cumulative Effects

Activities on NFS Lands

The Forest Service manages approximately 2% of the Days Creek–South Umpqua River watershed. There are currently no projects proposed on NFS lands in the watershed that would contribute to cumulative effects.

Activities on BLM land and Private Lands

The BLM manages approximately 41%, and private lands comprise about 57% of the Days Creek–South Umpqua River watershed. There are no projects proposed on BLM lands that might contribute to cumulative effects due to the project's miniscule footprint (0.31% of the basin). Private lands in the watershed are expected to be managed according to current land use patterns, consistent with the County General Plan and existing federal and state statutes, including the Oregon Forest Practices Act and the Clean Water Act. Industrial forest ownerships comprise the majority of the forested landscapes on private lands in the watershed.

Cumulative Effects

The project comprises about 2.2% of NFS lands, 0.31% of BLM lands, and 0.51% of private lands in the Days Creek–South Umpqua River watershed (table 2-5). The small proportion of the watershed affected by the project; ongoing land management on private lands; the regulatory framework between BLM, ODEQ, and ACOE applicable to the project; and the project location and routing make it highly unlikely that the portion of the project on federal lands, when considered with other past, present, and reasonably foreseeable future actions, would change watershed conditions in the Days Creek–South Umpqua River watershed in any significant, discernable, or measurable way. See also FEIS, chapter 4.14, Cumulative Effects.

Project Effects by ACS Objective

Table 2-11 compares the project effects against the objectives of the ACS. The project does not cross any stream channels and affects approximately 1.71 acres of the Riparian Reserves in the Days Creek–South Umpqua River watershed. All affected Riparian Reserves are near ridge tops. The intermittent streams associated with them would likely be dry during construction. The two wetlands are ridge top swales that have no apparent surface connection to drainages.

TABLE 2-11

Compliance of the Project with ACS Objectives, Days Creek–South Umpqua River Watershed

ACS Objective	Project Impacts
Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	Riparian Reserves are landscape-scale features that would be affected by the project. The project right-of-way would impact 2.2% of the NFS land in the Days Creek–South Umpqua River watershed. Approximately 0.15 acre of Riparian Reserves would be cleared. All of the vegetation cleared would be mid-seral. While the cutting of trees where the project right-of-way intersects two localized Riparian Reserves would result in a long-term change in vegetation condition, it would be minor in scale and well within the range of natural variability for vegetative change, given the fire history of the Days Creek–South Umpqua River watershed. The application of BMPs and erosion control measures, use of native vegetation, and the anticipated rapid revegetation of disturbed areas would likely further reduce project impacts. The level of impacts is well within the range of natural variability for disturbance processes described by Everest and Reeves (2007) and Agee (1993) and as documented in the South Umpqua Watershed Assessment (BLM 2001). The NFS lands in the Days Creek–South Umpqua River watershed are approximately 32% LSOG.
Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life-history requirements of aquatic and riparian-dependent species.	The project is not expected to affect spatial or temporal connectivity on NFS lands in the Days Creek–South Umpqua River watershed. No streams would be crossed, and impacts in Riparian Reserves would be minimal. Any residual levels of disturbance are anticipated to be well within the range of natural variability.
Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	The project would have no discernible impact on streambanks or bottoms in the Days Creek–South Umpqua River watershed because no stream channels would be crossed. The few impacts in Riparian Reserves are associated with near ridge-top intermittent streams or ridge top (wetland) swales that have no apparent surface connectivity to the drainage system. Therefore, there would be little influence on the physical integrity of the aquatic system.
Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	Sediment impacts are expected to be as described in section 1.4.1. Minor amounts of sediment would be mobilized during construction, but these impacts are expected to be short term and limited to the immediate project area. Connectivity to aquatic systems is limited since no stream channels would be crossed. With application of the ECRP and BMPs, no long-term impacts associated with sediment transport are anticipated. No impacts on water temperature are expected because the two waterbodies that would be crossed are isolated and not connected to an intermittent or perennial stream and no effective shade would be removed.
Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.	Areas of unstable soils have been avoided in project routing. There would be no stream channels crossed in the watershed because the route lies on a ridge top and connections to aquatic systems that would transport sediment do not exist. Sediment fluxes are expected to be minor, short-term, and well within the range of natural variability for the Klamath-Siskiyou Province with implementation of the erosion control measures in the ECRP and BMPs as well as the anticipated rapid revegetation that is characteristic of the province. Erosional impacts are, therefore, expected to be consistent with those described in section 1.4.1.
Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.	It is highly unlikely that the project would affect flows because there is no connectivity between the two isolated wetlands to any drainage system. The project routing is on a ridge top in the watershed and would not cross any stream channels. The watershed is hydrologically recovered (BLM 2001:143) and the project would affect less than 0.5% of the watershed (table 2-6) so changes in peak flows as a result of construction are highly unlikely.

TABLE 2-11

Compliance of the Project with ACS Objectives, Days Creek–South Umpqua River Watershed

ACS Objective	Project Impacts
Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	Two small forested wetlands would be crossed in or near a ridge top swale in the Stouts Creek subwatershed at MP 102.1 and 102.2. Trench plugs would be installed on each side of these wetlands to block subsurface flows and maintain water table elevations, as required by FERC's Wetland and Waterbody Construction and Mitigation Procedures. By restricting crossings to the dry season (July 1 to Sept. 15), possible impacts on water tables of these wetland areas are expected to be minor and short-term. These features appear to have no surface connectivity with the Stouts Creek drainage network.
Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation; nutrient filtering; and appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.	Approximately 0.15 acre or less than 0.01% of Riparian Reserves in the watershed would be cleared by the project. All affected Riparian Reserves are located at or near ridge tops and contribute little to the thermal regulation, nutrient filtering, bank erosion, and channel stability of the drainage networks in the watershed. Existing herbaceous and brush cover would be maintained in Riparian Reserves to the extent practicable. Replanting with native species would facilitate recovery of vegetation communities. These restoration and off-site mitigation efforts would contribute to the maintenance and restoration and physical functions of the Riparian Reserves in the watershed.
Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	Impacts to Riparian Reserves would be minimal. All of the Riparian Reserves are located at or near ridge tops. To maintain riparian habitat, construction BMPs would be implemented. Revegetation would be encouraged by planting of native riparian species. The persistence of riparian-dependent Survey and Manage species would not be threatened by project construction and operation in the watershed (see appendix F.5).

Summary

It is highly unlikely that construction and operation of the project would prevent attainment of ACS objectives due to the relatively small portion of NFS lands affected, the relative lack of intersections with waterbodies, and the small acreage of Riparian Reserves affected in the Days Creek–South Umpqua River watershed. No project impacts relevant to the ACS have been identified that are outside the range of natural variability for disturbance processes in the watershed (see table 2-17). The proposed amendment to the Umpqua National Forest LRMP to waive protection measures for Survey and Manage species would not prevent attainment of ACS objectives because the project does not threaten the persistence of any riparian-dependent Survey and Manage species. Mitigation measures associated with the project are responsive to watershed assessment recommendations and would improve watershed conditions where they are applied (see table 2-10).

2.2.1.4 Elk Creek–South Umpqua River Fifth-Field Watershed, HUC 1710030204

Overview

Originating in the Cascades Range, the Elk Creek–South Umpqua River watershed is one of 13 fifth-field watersheds comprising the South Umpqua Subbasin, which drains about 1,800 square miles of southern Oregon. Located about 30 miles southeast of Roseburg in the Umpqua National Forest (Tiller Ranger District), most of the watershed lies in Douglas County but a small portion along the southwest border lies in Jackson County (figure 2-1). The watershed was designated a Tier 1 Key watershed in the NWFP.

This watershed straddles the Western Cascades and the Klamath-Siskiyou provinces. Bedrock in the upper reaches consists of volcanic materials including lava and pyroclastic flows typical of the Cascades Province, whereas the bedrock in a majority of the watershed is primarily the granite, granodiorite, schist, and serpentinite found in the Klamath-Siskiyou Province.[14]

The Elk Creek–South Umpqua River watershed is bordered on the north by the Days Creek–South Umpqua River Tier 1 watershed, on the northeast by the Middle South Umpqua River–Dumont Creek and Jackson Creek watersheds, on the southwest by the Upper Cow Creek watershed (also in the South Umpqua River system), and on the south and east by the Trail Creek and Elk Creek–South Umpqua River watersheds.

In the Elk Creek–South Umpqua River watershed, the drainage network flows northwest, with Elk Creek crossing the northwest watershed boundary within the Days Creek–South Umpqua River watershed and discharging into the South Umpqua River. At Roseburg, the South and North Umpqua Rivers join to form the Umpqua River, which flows northwest through the Oregon Coast Range and empties into the Pacific Ocean at Winchester Bay. See figure 1-1 for the regional setting of this watershed and its relationship to the other fifth-field watersheds traversed by the project.

The 84.9-square-mile (54,356-acre) Elk Creek–South Umpqua River watershed includes four subwatersheds: Upper Elk Creek, Middle Elk Creek, Drew Creek, and Lower Elk Creek (figure 2-3). Land ownership in the watershed is primarily within the Umpqua National Forest (62.9%) managed by the Tiller Ranger District (table 2-12). NFS land is found in all four subwatersheds, with holdings ranging from 6,334 acres in the Middle Elk Creek subwatershed to 10,584 acres in the Upper Elk Creek subwatershed (table 2-12). BLM lands constitute 0.7% of the watershed, and private lands constitute 36.4% of the watershed.

Elevations in the watershed range from about 640 feet where Elk Creek leaves the northwestern part of the watershed and flows into the South Umpqua River to about 4,040 feet at the head of Days Creek in the northeastern part of the watershed. Over 82% of the land in the watershed is in the TSZ. Removal of canopy cover in the TSZ can influence peak flows during warm rain-on-snow events.

The Elk Creek–South Umpqua River watershed has a Mediterranean-type climate, with cool, wet winters and hot, dry summers, during which the fire threat is greatest. Annual precipitation ranges from about 30 inches at Canyonville in the lower part of the watershed to more than 60 inches at the highest elevations. About 85% of the precipitation falls from October through April. At the highest elevations, a substantial portion of the precipitation falls as snow. Summer rainfall is typically less than 5 inches and is typically associated with high-intensity summer thunderstorms.

About 14,271 acres (41.74%) of the NFS land is allocated as LSR. Most of the NFS land allocated as LSR in the watershed is in the South Umpqua River/Galesville LSR. Land allocated as matrix

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[14] Provinces discussed in this document are based on both ecological and geological conditions and therefore do not match those recognized by the Oregon Department of Geology and Mineral Industries and the Oregon State Board of Professional Geologists and Geophysicists. The Klamath-Siskiyou Province is known by professional geologists as the Klamath Mountains Province and the Western Cascades and the High Cascades are two mountain ranges within the Cascades Mountains Province. See https://www.oregongeology.org/learnmore/geologicsightseeing.htm

constitutes 55.23% of the NFS lands in the watershed. Approximately 9,397 acres or 27.49% of NFS lands in the watershed are in Riparian Reserves.

Location and Routing

Leaving the Days Creek–South Umpqua River fifth-field watershed on an upland landscape near the ridgeline, the project first enters the Elk Creek–South Umpqua River watershed at MP 101.8 (figure 2-3). The project then skirts the southwest divide separating the Lower Elk and Drew Creek subwatersheds from the Days Creek–South Umpqua River and Upper Cow Creek fifth-field watersheds. Along this segment, the project right-of-way runs alternately on both sides of these divides. On leaving the watershed at MP 109, the project right-of-way drops down into the South Fork Cow Creek subwatershed of the Upper Cow Creek fifth-field watershed.

In all, approximately 3.26 miles of the project right-of-way are in the Elk Creek–South Umpqua River watershed, with 2.67 miles on NFS land (table 2-13). NFS land is crossed in the Drew Creek and Lower Elk Creek subwatersheds (figure 2-3). In addition, 0.1 mile of BLM land and 0.49 mile of private land are crossed in the Lower Elk Creek subwatershed. Most of the traversed land is in the TSZ, where clearing could contribute to elevated peak flow conditions during warm rain-on-snow events.

Project effects in the Elk Creek–South Umpqua River watershed total 36.51 acres, due primarily to clearing (table 2-13). These affected acreages include 29.91 acres of NFS land (28.67 acres cleared and 1.24 acres modified, constituting 0.09% of the NFS lands in the watershed). Including all land ownerships, 0.07% of the land in the watershed would be affected by project construction (table 2-15).

Effects to LSRs on NFS lands in the Elk Creek–South Umpqua River watershed total 21.23 acres, which accounts for 0.15% of the LSR on NFS lands. Most of these effects are due to clearing (table 2-14). About 8.63 acres of matrix land on NFS lands would also be affected by project construction. Approximately 0.54 acre of Riparian Reserves would be affected on NFS lands in the Elk Creek–South Umpqua River watershed.

Figure 2-3 PCGP Routing and Subwatershed Boundaries, Elk Creek–South Umpqua River Watershed

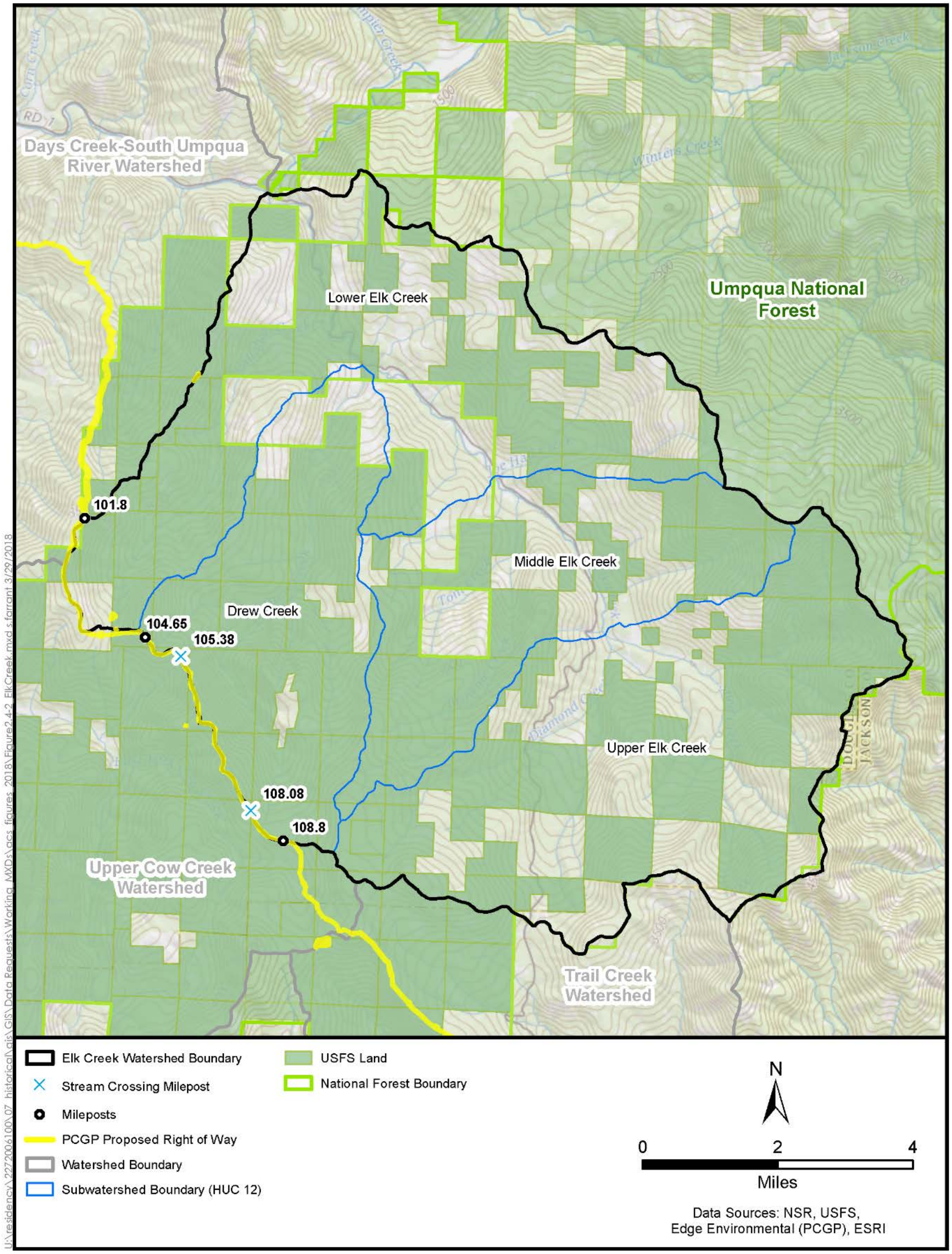

TABLE 2-12

Land Ownership and Forest Service Land Allocations (acres) in Elk Creek–South Umpqua River Fifth-Field Watershed (HUC 1710030204)

	Land Ownership (acres)					Forest Service Land Allocation (acres)		
Sixth-Field Watershed	**Sixth-Field Watershed (acres) a/**	**NFS Land**	**BLM**	**Total NFS and BLM**	**Other**	**LSR**	**Riparian Reserves b/**	**Matrix**
Drew Creek	9,621.17	8,050.35	0.00	8,050.35	1,570.82	5,293.49	2,372.51	2,526.09
Lower Elk Creek	16,881.51	9,209.06	140.01	9,349.07	7,532.44	3,021.36	2,656.99	5,993.16
Middle Elk Creek	10,271.53	6,337.49	0.00	6,337.49	3,934.04	2,425.35	1,611.48	3,659.79
Upper Elk Creek	17,581.71	10,590.46	230.23	10,820.69	6,761.02	3,530.90	2,755.53	6,701.48
Watershed Total	**54,355.92**	**34,187.36**	**370.24**	**34,557.60**	**19,798.32**	**14,271.10**	**9,396.51**	**18,880.52**

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a/ All data derived from Stantec-based GIS layers.
b/ May occur within other NFS land allocations.

TABLE 2-13

Project Corridor (miles) and Project Area (acres) in Elk Creek–South Umpqua River Fifth-Field Watershed (HUC 1710030204) by Land Ownership

	Land Ownership							
	NFS Lands				**Entire Sixth-Field Watershed**			
		Project Area (acres)				**Project Area (acres) b/**		
Sixth-Field Watershed a/	**Corridor Length (miles)**	**Cleared**	**Modified**	**% of NFS Land Impacted**	**Corridor Length (miles)**	**Cleared**	**Modified**	**% of Sixth-Field Watershed Impacted**
Drew Creek	2.45	26.05	0.00	0.08	2.45	26.05	0.00	0.27
Lower Elk Creek	0.22	2.62	1.24	0.01	0.81	8.73	1.73	0.06
Middle Elk Creek	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Upper Elk Creek	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Watershed Total	**2.67**	**28.67**	**1.24**	**0.09**	**3.26**	**34.78**	**1.73**	**0.07**

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a/ All data derived from Stantec-based GIS layers.
b/ Includes NFS, BLM, and other ownerships.

TABLE 2-14

Project Area (acres) on NFS Lands in the Elk Creek–South Umpqua River Fifth-Field Watershed (HUC 1710030204) by Land Allocation

	Designated LSR b/				Matrix				Riparian Reserves b/			
	Project Area (acres)		**% of Total LSR on NFS Land**		**Project Area (acres)**		**% of Total Matrix on NFS Land**		**Project Area (acres)**		**% of Total Riparian Reserves on NFS lands c/**	
Sixth-Field Watershed a/	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**
Drew Creek	20.94	0.00	0.40	0.00	5.11	0.00	0.20	0.00	0.51	0.00	0.00	0.00
Lower Elk Creek	0.29	0.00	0.01	0.00	2.32	1.20	0.04	0.02	0.03	0.00	<0.01	0.00
Middle Elk Creek	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Upper Elk Creek	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Watershed Total	**21.23**	**0.00**	**0.15**	**0.00**	**7.43**	**1.20**	**0.04**	**0.01**	**0.54**	**0.00**	**<0.01**	**0.00**

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a/ All data derived from Stantec-based GIS layers.
b/ Includes mapped and unmapped LSR on NFS lands.
c/ Riparian Reserve acres overlap with LSR and matrix land allocations.

TABLE 2-15

Riparian Reserve Effects Elk Creek–South Umpqua River Fifth-Field Watershed HUC 1710030204

Jurisdiction	MP	Waterbody	Description		Waterbody Type	Crossed	Width of Crossing (feet)	Wetland Acres Crossed	Clipped	**Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres) c/, f/**														Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus	Roads and Other Altered Habitats	Gross Riparian Reserves	fish bearing	Anadromy
										RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80+)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40)	Stream Channel or Wetland Area	Net Riparian Reserve Cleared						
Drew creek Subwatershed HUC 171003020403																													
UMP NFS	105.38	D	Ditch		D	Yes			No																		0	No	No
UMP NFS	108.08	D	Ditch		D	Yes			No																		0	No	No
Subtotal Drew Creek			**Crossed: 2 Ditches**	**Clipped: None**	**2**	**0**			**1**																		**0**	**No**	**No**
Total Elk Creek			**Crossed: 2 isolated features**		**3**	**2**			**1**																		**0.54**	**No**	**No**

a/ "Crossed" indicates that the pipeline trench crosses the waterbody or wetland.

b/ "Clipped" indicates that the pipeline corridor crosses a portion of the Riparian Reserve, but the pipeline trench does not cross the associated waterbody. Acre values shown as "0.00" are GIS slivers that are less than 0.01 acre.

c/ Wetland Riparian Reserves often overlap with associated or nearby Riparian Reserves for streams. Where this occurs, the Riparian Reserve component of the wetland is counted with the stream channels to avoid double counting.

d/ Roads and other altered habitats such as rock pits sometimes occur within Riparian Reserves. These features do not have riparian features and are not considered part of the Riparian Reserve vegetated area.

e/ "Anadromy" means that a stream contains anadromous fish or that it is a tributary that directly influences an anadromous stream.

f/ Ditches do not create Riparian Reserves and are shown as 0 acres. They are NOT included in tallies of water body crossings.

Existing Conditions

Original Watershed Analysis Findings

The Forest Service completed the Elk Creek Watershed Assessment in 1996. Watershed conditions described in the assessment are summarized as follows:

- In the Elk Creek–South Umpqua River watershed, soils within the project right-of-way originate on landscapes underlain by granite and schist terrains. The Elk Creek Watershed Assessment documents that the granitic terrain in the Elk Creek–South Umpqua River watershed has the lowest rate of natural landslides. Landslides related to management activity are primarily associated with timber sales.

- The TSZ in the Tiller Ranger District occurs between 2,000 and 5,000 feet elevation (Forest Service 1990b). In the Elk Creek–South Umpqua River watershed, 44,924 acres or 82% of the watershed is in this transient zone. Since the majority of the watershed is influenced by the TSZ, projects that remove canopy cover should consider the effect on peak flows.

- Channel extension from high road densities (and hence effects on peak flows and increased sediment transport) is greatest on paved and aggregate surfaced roads with ditch lines and culverts.

- The road density within each basin ranges from 1.83 to 5.67 miles per square mile. An estimated 66.2 miles of increased channel extension to the stream network is attributable to the road system. The majority of roads (77%) were constructed prior to 1980. Roads constructed prior to the mid-1970s, depending on road grade, were built using balanced cut and fill construction on moderate-grade slopes using side-casting excavation and installing culverts at perennial stream crossings and cross drains in the road design inconsistent with today's standards.

- Native surface and non-system roads were found to contribute less to channel extension (and hence to peak flows and sediment routing) because such roads are shorter, steeper, and higher on the hill slope and tend to be narrow and outsloped. As such, these roads tend not to accumulate water but rather to shed it quickly. The low contribution of surface runoff and erosion of the native-surfaced and non-system roads to the stream network indicate that they may not be as large a factor in increased stream sedimentation as the surfaced roads because the sediment deposition occurs quickly near the source.

- Modern forest management has disrupted historic disturbance processes. Thus, many fundamental ecosystem processes have been disrupted, including plant succession, nutrient cycling, and other processes that rely on the ecosystem patterns historically created by fire. Timber harvest has occurred in 37% of the lands managed by the Forest Service within the watershed. Approximately 20% of the harvest has been by regeneration methods and 17% by selection methods. Fire suppression has nearly eliminated disturbance from the rest of the landscape. The result of this changed disturbance regime is a fragmented landscape low in late-successional vegetation, with unusually high conifer density. Conifer species, specifically pines, are being killed directly as a result of high tree density and indirectly by insect attack. The habitat formerly provided by frequent, low-severity fires is completely absent from the landscape. Wildfire hazard has increased with the accumulation of live and dead fuel and landscape homogenization. These conditions suggest that sustainability, as affected by diversity and health, has declined.

- Terrestrial vegetation has changed dramatically since 1939. The establishment stage increased by only 4%, stem exclusion increased by 33%, and late-successional growth decreased by 31% in the watershed. Wildlife populations that use late-successional habitat for survival have likely decreased in response to loss of habitat. The northern spotted owl, which is federally listed as threatened, currently inhabits the watershed and is tied to late-seral habitat for life history requisites. Other sensitive species and species of concern to the Forest Service that rely on a variety of plant communities in the watershed include red-tree vole, great gray owl, red-legged frog, and the Umpqua mariposa lily, a serpentine endemic. Unique habitats that have persisted over time such as Savage Bluffs, Hamlin Prairie, Callahan Meadow, Drew Meadow, and the oak woodlands provide habitat that is key to the survival of several sensitive and rare plants and animals. Some of these species are the ball-head phacelia, Waldo rock cress, Thompson's mistmaiden, and California mountain kingsnake. These habitats have decreased in size due to conifer encroachment, exclusion of fire, road building, and firewood use. Negative effects that have altered native species composition include grazing and introduction of non-native plants.

Management recommendations from the watershed assessment that are pertinent to the PCPG in the Elk Creek–South Umpqua River watershed are summarized below. The congruence of the project with each recommendation is noted. [15]

<u>Landscape Recommendation 1:</u> Concentrate activities in watersheds that have already had heavy impacts from roads and harvesting to restore the landscape-level vegetation and aquatic conditions. Minimize sediment production and inputs to streams, minimize erosional processes, and reduce road densities throughout the watershed. Use Knutsen Vandenberg funding and road reconstruction packages from proposed activities to pay for restoration projects.

- **Project:** The project accomplishes these recommendations primarily by route location, application of the ECRP, and use of BMPs in the construction right-of-way. In the Elk Creek–South Umpqua River watershed, the project right-of-way lies entirely on ridge tops. Where the route leaves the ridge top in the East Fork Cow Creek, it does so to avoid high-quality spotted owl habitat in Elk Creek. By leaving the ridge top and passing into the East Fork Cow Creek, the project avoids fragmenting high-quality late-successional forest.

<u>Landscape Recommendation 3:</u> Defer harvest in existing interior late-successional patches and their buffers until existing stem exclusion stands have developed into replacement habitat. Currently, late-successional interior habitat occurs sporadically throughout the watershed as patches embedded in a sea of stem exclusion vegetation. Vegetation manipulation that promotes diversity in the stem exclusion stands and expedites the development of late-successional habitat is encouraged.

- **Project:** The project accomplishes this recommendation by route location and proposed mitigation measures. To minimize impacts in late-successional stands, the route is located on major ridge tops. Where the route leaves the ridge top and turns into the East Fork Cow

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[15] Elk Creek Watershed Assessment, p. 156.

Creek, it does so in part to avoid high-quality spotted owl habitat. The East Fork Cow Creek is already heavily roaded so the project does not fragment high-quality late-successional forest.

<u>*Landscape Recommendation 22:*</u> Channel extension occurs across the landscape in the Elk Creek–South Umpqua River watershed. Channel extension can be reduced by adding culverts, drain dips, and other drainage structures to existing roads to help interrupt direct stream extension by dispersing the water on the hillside at desired locations rather than channeling it into existing streams. Obliterating roads would reduce road densities and decrease channel extension.

- **Project**: Consistent with this recommendation, roads used by Pacific Connector to access the project would be upgraded and maintained as needed.

<u>*Project Recommendation 10:*</u> When aggregating harvest units, consider the effect on peak flows. Canopy removal in snow zones may increase streamflow. The cumulative effects of canopy removal and added road ditches on peak flows and aquatic habitat should be examined at the project level.

- **Project:** The FERC conducted a project-level peak flow assessment for the project and concluded that the project was highly unlikely to contribute to an increase in peak flows.

<u>*Specific Recommendations for Drew Creek and Callahan Creek Subwatersheds*</u>

Most of these subwatersheds are part of the South Umpqua River/Galesville LSR. Any management activities in these subwatersheds should meet the objectives and follow the guidelines in the South Umpqua River/Galesville LSR.

- **Project:** Although this LSR is in the Klamath-Siskiyou Province, where harvest of trees over 80 years old to accomplish fuels objectives is permitted, the Late Successional Reserve Assessment (LSRA) recommends that trees over 80 years old not be cut. It is likely that a small percentage of the trees in the shaded fuel break proposal would be over 80 years old. In this circumstance, trees greater than 80 years old would be removed only where necessary to achieve the fuel break objectives. This is permissible under the standards and guidelines applicable to the Klamath-Siskiyou Province (Forest Service and BLM 1994b, C-13). The project would also remove an estimated 65 acres of trees older than 80 years from LSR 223 (includes both Elk Creek–South Umpqua River and Cow Creek watersheds) in the Umpqua National Forest (FERC 2010). Umpqua National Forest LRMP Standards and Guidelines for new developments in LSRs make provisions for utility corridors in LSRs.

Most of the Drew and Lower Elk Creek subwatersheds are composed of granite or schist soil types. All management activities in these subwatersheds should follow the guidelines in the 1995 Tiller Ranger District granite and schist policy.

- **Project:** The project is consistent with the Tiller Ranger District granite and schist policy. Callahan Creek in the Lower Elk Creek subwatershed has been identified as a major contributor of sediment inputs to the South Umpqua River. Debris flows and landslide frequencies related to timber harvest and road construction are very high in this watershed; however, the natural landslide rate is the lowest in the Elk Creek–South Umpqua River watershed. Restoration of upland processes should be considered a priority in the Lower Elk Creek subwatershed. Road obliteration and rehabilitation projects would likely reduce sediment inputs.

- **Project**: The project lies entirely on ridge tops in these subwatersheds to avoid side-hill areas prone to management-caused landslides. The mitigation plan filed by Pacific Connector includes approximately 5.9 miles of road decommissioning in the Lower Elk Creek subwatershed. Shaded fuel breaks with underburning, meadow restoration, off-site pine removal, and precommercial thinning in LSRs all serve to restore upland processes.[16]

Changed Watershed Conditions

There have been no large-scale disturbances that would change the conditions described in the watershed analysis prior to summer 2015. In July 2015, the Stouts Fire began in the adjoining watershed and rapidly spread into several other watersheds, including the Elk Creek–South Umpqua River watershed. The fire was fully contained by early September 2015. Overall, the fire burned 26,452 acres of BLM, NFS, and private land and impacted resources associated with LSRs and Riparian Reserves. The fire affected the Drew Creek, Lower Elk Creek, and Middle Elk Creek subwatersheds. A total of 13,481 acres were burned within these subwatersheds, with 11,482 acres on NFS land and 17 acres on BLM land. The Forest Service BAER team identified issues from the fire involving seedling planting, noxious weeds, soil stabilization, road/trail water diversion, tree hazard removal, and monitoring. In November 2015, Stantec biologists, foresters, and geomorphologists conducted a field review of the burned area and surrounding watersheds. In conjunction with the data from the BAER reports, it was determined that the burn severity was moderate (25 to 50% of canopy cover mortality). The Stouts Fire Supplement to Appendix J of the 2015 Final EIS for the PCGP project contains more details on the Stouts BAER report, as well as the post-fire watershed projects that were implemented.

Prior to this fire, the Forest Service and BLM had conducted a number of management activities in the watershed based on the recommendations in the watershed analysis (table 2-16).

TABLE 2-16

Activities in Elk Creek Since Publication of the Elk Creek Watershed Analysis, October 1996

Name	Activity Type	Dates	Total Acres/Miles	Location
Joe Hall Cr. Bridge Construction	Replace culvert with bridge	2012	1 ac	Lower Elk (6th)
Elk Cr. Instream Restoration	Add rock and large wood	2012	0.1 mi	Elk (5th)
Eight County Hazardous Fuels Reduction	Pile burning	2009	341	Elk (5th)
Eight County Hazardous Fuels Reduction	Precommercial thin	2009	393	Elk (5th)
Drew Vegetation	Pile burning	2009–2012	68 ac	Low and Middle Elk (6th)
Drew Vegetation	Commercial thin	2008–2012	340 ac	Low and Middle Elk (6th)
Drew Vegetation	Precommercial thin	2007	53 ac	Low and Middle Elk (6th)

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[16] Ibid.

TABLE 2-16

Activities in Elk Creek Since Publication of the Elk Creek Watershed Analysis, October 1996

Name	Activity Type	Dates	Total Acres/Miles	Location
Diamond Cr. Bridge Construction	Tree removal, bridge construction	2008	1 ac	Upper Elk (6th)
Joe Hall Instream	Add rock and large wood	2006	2 mi	Lower Elk (6th)
Joe Hall Instream Phase 2	Add large wood	2007	1 mi	Lower Elk (6th)
Joe Hall Landslide Stabilization	Riparian shrub planting	2008	2 ac	Lower Elk (6th)
Joe Hall Logs	Blowdown log removal	2006	80 ac	Lower Elk (6th)
Brownie Instream	Add large wood	2007	2 mi	Upper Elk (6)
Brownie Instream Logs	Blowdown log removal	2007	14 ac	Elk headwater (6th)
Devils Knob Fuelbreak	Precommercial thin	2012	268 ac	Lower Elk (6th)
Devils Knob Fuelbreak	Pile burning	2012	268 ac	Lower Elk (6th)
Cattle Grazing	Cattle grazing	1996–2006	43,140 ac	Elk (SU - 5th)
Cattle Grazing	Cattle grazing	2007–2012	32,860 ac	Elk (SU - 5th)
Drew 1 (Calochortus)	Precommercial thin	2001	15 ac	Lower Elk (6th)
Drew 1 (Calochortus)	Prescribed burn	2001	15 ac	Lower Elk (6th)
Drew 2 (Calochortus)	Precommercial thin	2005	120 ac	Drew (6th)
Drew 2 (Calochortus)	Prescribed burn	2005	120 ac	Drew (6th)
Wildfire	Wildfire	1991–2012	41 ac	Lower and Middle Elk (6th)
Summit Mdw. Restoration	Prescribed burn, snag creation	2001	98 ac	Lower Elk (6th)
Weed Treatment	Hand pull/cut	1997–2012	2400 ac	Elk (SU - 5th)
Reforestation	Tree planting	1997–2003	467 ac	Elk (SU - 5th)
Clearcutting on Private Land within District Boundary	Clearcut	1996–2006	249 ac	Lower Elk (6th)
Clearcutting on Private Land within District Boundary	Clearcut	1996–2012	2,934 ac	Upper Elk (6th)
Commercial Thinning on Private Land within District Boundary	Commercial thin	2006	6 ac	Lower Elk (6th)
ERFO Road Repair	Road repair	1996–2006	10 ac	Elk (5th)
Road Maintenance	Brushing, grading, resurfacing	2010–2012	53 mi.	Elk (5th)

Current Watershed Conditions

Watershed conditions have improved in the Elk Creek–South Umpqua River watershed with accomplishment of restoration projects and implementation of the NWFP; however, most of the issues identified in the watershed assessment remain. NWFP monitoring showed improving watershed condition trends in the Drew Creek and Lower, Middle, and Upper Elk Creek subwatersheds. Drew Creek showed a slight negative trend on roads while the other subwatersheds were neutral to improving. A Forest Service Watershed Condition Class evaluation rated the Drew Creek subwatershed as “functioning at risk,” with at-risk impacts from water quality issues, fire risk, and roads.

Natural Disturbance Processes

Disturbance processes in the Elk Creek–South Umpqua River watershed are consistent with those described for the Klamath-Siskiyou and Western Cascades provinces in chapter 1 of this document. Prior to modern management, fire was the dominant process affecting upslope and riparian vegetation above the floodplain. The fire regime for this watershed is characterized by Agee (1993) as moderate. A diverse combination of fires with variable intensity, frequency, and size created an equally diverse pattern of landscape and stand vegetation. With the onset of modern management, that disturbance process has been altered. Fire suppression has excluded all but small gap disturbances outside of areas where timber harvest has occurred, fragmenting the landscape. Fire exclusion and timber harvest have increased homogeneity in mid-seral plant communities while decreasing early- and late-seral vegetation. Shade- and density-tolerant white-fir has increased at the expense of shade-intolerant fire-adapted Douglas-fir and yellow pines and most hardwoods. Fire hazard and the magnitude of insect and disease activity are likely higher than before modern management (Forest Service 1996: 8).

Project Effects and Range of Natural Variability

Table 2-17 addresses relevant ecological processes and the historic range of variability in the Elk Creek–South Umpqua River watershed.

TABLE 2-17

Project Effects and Relevant Ecological Processes Described in the Elk Creek–South Umpqua River Fifth-Field Watershed Assessment

Ecological Processes Relevant to the Project	Historic Range of Variability	Pacific Connector Effects
Erosional Processes	Landslides are a dominant geomorphic process for sediment delivery to stream systems in the watershed under natural conditions. Historically, shallow landslides were associated with high-intensity rainfall events that overlapped with infrequent high-intensity fires. These events resulted in large depositions of coarse wood and coarse sediments to stream systems. Agricultural development on private lands and high road densities throughout the watershed have resulted in chronic fine-grained sediment becoming the primary sediment source. Roads, some affected by landslides, can be a chronic source of sediment transport to waterbodies. In some cases, culverts are undersized and plugged. Roads in the watershed have substantially extended the drainage system during storms, resulting in increased sediment transport and peak flows. Many exposed soils in the watershed are subject to rapid surface erosion during storm events, resulting in increased sediment loads in streams.	Landslide-prone areas have been avoided in routing of the project. All areas crossed by the project right-of-way are classified as very low to low risk due to the low probability of mass wasting movement and no significant consequences (Geoengineers 2009). The project within the Elk Creek–South Umpqua River watershed is located entirely on ridge tops. Erosion control measures and BMPs would be implemented to minimize sediment transport off the project right-of-way and thereby reduce the landslide hazard and consequences. Rapid revegetation of disturbed areas, encouraged by replanting with native species, is anticipated. As a result, sediment effects are expected to be minor, short-term, and well within the range of natural variability for the watershed. Road decommissioning and storm-proofing mitigation projects would likely reduce significant sources of sediments. Off-site fuel-hazard reduction mitigation projects in the watershed would help reduce the risk and probability of high-intensity, stand-replacing fire and associated sediment.

TABLE 2-17

Project Effects and Relevant Ecological Processes Described in the Elk Creek–South Umpqua River Fifth-Field Watershed Assessment

Ecological Processes Relevant to the Project	**Historic Range of Variability**	**Pacific Connector Effects**
Ecological Succession/ Vegetative Condition	The watershed has been heavily affected by both aboriginal and contemporary human use. Before Euro-American settlement, the dominant factor affecting overall landscape patterns was wildfire, which created a complex mosaic of large, even-age stands with large numbers of snags and fire-maintained natural openings. Logging and fire suppression have greatly modified the seral composition of forests in the watershed, with increases in early- and mid-seral forests and extensive fragmentation of late-seral forest stands.	The project would have minimal impact on vegetation in Riparian Reserves. A small amount of Riparian Reserves (0.54 acre), all located in ridge top areas, would be impacted. Approximately 0.28 acre of the affected Riparian Reserves is LSOG and 0.26 acre is mid-seral.
Flow Regime	Surface and shallow ground water flow regimes are directly related to the precipitation regime, which in this watershed largely involves rainfall. Under natural conditions, most of the rain falling in the watershed percolates into the soils, where its movement toward aquatic habitats is delayed. Large, high-intensity fires may create conditions that significantly increase flows. Roads can extend the drainage system and accelerate the transport of runoff to stream channels. Clearing of the TSZ in past and ongoing logging and road construction operations has likely contributed to increased peak flows during warm rain-on-snow events. The absence of LWD and boulders in streams also fosters increased peak flows.	Vegetative conditions may contribute to peak flows when more than 25% of a watershed is in the TSZ and less than 30 years old or where there has been extensive vegetation loss after a stand-replacing fire. The project affects 0.07% of the watershed. The limited scale of vegetative impact, the project's location on ridge tops, and the limited connectivity to aquatic systems make it unlikely that the project would contribute to an increase in peak flows. Improvements to access roads identified in the TMP along with several off-site road improvement mitigation projects are intended to reduce road-related effects to flow regimes in the watershed and mitigate any project effects. The amount of project-related clearing on TSZ lands is small and should not contribute to elevated peak flows during warm rain-on-snow events. See FEIS, chapter 4.3, for additional discussion.
Stream Temperature	In the absence of disturbance, pre-settlement water temperatures were likely below those currently experienced on streams in the watershed. Stand-replacing wildfires and human disturbance (mainly logging, particularly in riparian areas, and road construction) have increased exposure of watershed streams to sunlight, resulting in elevated water temperatures outside the natural range. Absence of LWD in streams has also likely contributed to higher stream temperatures by reducing pool frequency and size and allowing streams to widen.	There are two ditch crossings on NFS lands in the watershed, and a small amount of riparian vegetation would be cleared at these crossings during project construction. These two crossings have intermittent flow and are unlikely to have any effect on stream temperatures. Therefore, they should have no effect on temperatures on water bodies downstream.
Aquatic Habitat and Stream Channel Complexity	Prior to human impact, beaver dams and high densities of LWD in log jams created complex channels and maintained pools in streams of the watershed. Water was stored in the channel and as shallow ground water in perched aquifers or unconfined aquifers in the streambanks and floodplains. Significant amounts of this water were slowly released during the summer, thereby sustaining flows. A combination of LWD and riparian vegetation indicated stable streambanks and channels that were relatively resilient during floods. Removal of LWD and inadequate sources of replenishment of LWD to the creek channels and riparian zones has substantially reduced the complexity of the stream channels, rendering them less suitable as aquatic habitat. The presence of poorly designed and faulty culverts restricts access of anadromous and resident fish populations to upstream habitat.	Since there are no stream crossings in this watershed (except for two intermittent wetted ditches), no LWD or boulders would be removed from streams during construction. The very limited effects to Riparian Reserves in the watershed would be mitigated by replanting with native vegetation. Therefore, no long-term effects to aquatic habitat and channel complexity are anticipated.

Compliance with Umpqua National Forest Land and Resource Management Plan

Table 2-18 provides Umpqua National Forest LRMP Standards and Guidelines relevant to the ACS that are applicable to NFS lands in the Elk Creek–South Umpqua River watershed.

TABLE 2-18

Umpqua National Forest LRMP Standards and Guidelines in the Elk Creek-South Umpqua River Watershed

LRMP Standard/Guideline	Project Compliance
Riparian Reserves - Lands; LH-4	Terms and conditions to ensure compliance with ACS objectives in the Elk Creek–South Umpqua River watershed have been incorporated into the 2019 POD prepared by the applicant in conjunction with the Forest Service and submitted as part of the right-of-way application. The POD includes 28 exhibits, including the Wetland and Waterbody Crossing Plan, the Erosion Control and Revegetation Plan, the Hydrostatic Test Plan, the Right-of-way Clearing Plan, and the TMP, etc.
Riparian Reserves - General Riparian Area Management; RA-4	Hydrostatic test and dust abatement water withdrawals would not compromise aquatic habitats during low-flow conditions in the Elk Creek–South Umpqua River watershed because all such needs would be provided by municipal sources.
Riparian Reserves - Road Management; RF-2	No new project roads intersect Riparian Reserves in the Elk Creek–South Umpqua River watershed.
Riparian Reserves - Road Management; RF-4	No new project-related road crossings of streams are proposed in the Elk Creek–South Umpqua River watershed. Several existing crossings would be upgraded to minimize erosion potential and facilitate fish passage through the reach. Specific specifications in POD attachment TMP section 2.2.3 and Exhibit F, section F.9.e of the Wetland and Waterbody Crossing Plan attachment to the POD require culvert and bridge replacements to meet agency standards and agency approval of plans.
Riparian Reserves - Road Management; RF-5	Road maintenance specifications in the TMP require implementation of T-831, T-842, T-811, and T-834, which are maintenance specifications designed to minimize sediment delivery to aquatic habitats. These specifications would be implemented during project construction in the Elk Creek–South Umpqua River watershed. In addition, off-site mitigation measures (culvert replacements) would improve road conditions, further minimizing sediment transport to adjacent aquatic habitats.
Riparian Reserves - Road Management; RF-6	Fish passage would be maintained at all road crossings where project-related road repairs are implemented in the Elk Creek–South Umpqua River watershed. Some existing crossings would be upgraded. In addition, off-site mitigation measures (culvert replacement) would be implemented to expand fish migration in the watershed.
Riparian Reserves - Road Management; RF-7	The TMP submitted by the applicant and accepted by the Forest Service meets all the requirements of RF-7 in the Elk Creek–South Umpqua River watershed.
Riparian Reserves - watershed and Habitat Restoration; WR-3	Application of BMPs and other aggressive erosion control measures, restricted construction windows, and numerous other impact minimization measures have been incorporated into several exhibits to the POD to prevent habitat degradation in the Elk Creek–South Umpqua River watershed. These measures are not being used as a substitute for otherwise preventable habitat degradation or as surrogates for habitat protection.

TABLE 2-18

Umpqua National Forest LRMP Standards and Guidelines in the Elk Creek-South Umpqua River Watershed

LRMP Standard/Guideline	Project Compliance
Management direction for Survey and Manage species in the NWFP ROD was replaced by the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines as Modified by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.)	The project affects Survey and Manage species within the Elk Creek–South Umpqua River watershed. Such effects are inconsistent with management recommendations for Survey and Manage Species in the 2001 ROD for Survey and Manage Species. However, the project does not threaten the persistence of any Survey and Manage species (see appendix F.5). Waiving application of Management Recommendations for Survey and Manage species in the watershed would not prevent attainment of any ACS objective.
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth-field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15% or less late-successional forest. (The assessment of 15% will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands. Protection of these stands could be modified in the future, when other portions of the watershed have recovered to the point where they could replace the ecological roles of these stands.	Federal lands in the Elk Creek–South Umpqua River watershed are currently 45% LSOG and exceed the threshold.

The Elk Creek–South Umpqua River watershed is a Key Watershed where special standards and guidelines apply. These are described in table 2-19.

TABLE 2-19

Project Consistency with Standards and Guidelines for Key Watersheds, Elk Creek–South Umpqua River Watershed

Standard and Guideline	Project Consistency	Mitigation
Reduce existing system and nonsystem road mileage with no net increase in road miles.	No new roads would be constructed by Pacific Connector. The construction road in the project right-of-way would be obliterated after construction.	Decommissioning of 5.9 miles of road would result in a net decrease of road miles.
No new roads would be constructed in inventoried Roadless Areas.	No part of the project is in an inventoried Roadless Area.	None needed
Watershed analysis must be completed prior to management activities.	Watershed analysis has been completed for all watersheds crossed by the project on Forest Service lands.	Off-site mitigation measures are consistent with watershed analysis recommendations.

Relationship of Proposed LRMP Amendment UNF-3 to the ACS

UNF LRMP IV-67-1, Forest-Wide Soils Standard and Guideline, states:

> The combined total amount of unacceptable soil condition (detrimental compaction, displacement, puddling or severely burned) in an activity area (e.g., cutting unit, range allotment, site preparation area) should not exceed 20%. All roads and landings, unless rehabilitated to natural conditions, are considered to be in detrimental condition and are included as part of this 20%.

Degraded soil conditions may occur in the cleared project areas. On NFS lands in the Elk Creek–South Umpqua watershed, approximately 90% (29 acres) of the project right-of-way would be cleared. Degraded soil conditions may result from displacement and compaction following completion of project construction and rehabilitation. Compaction can largely be addressed by subsoil ripping, but displacement would be unavoidable because of the nature of the project. Existing LRMP Standards and Guidelines allow up to 20% of the project right-of-way, or 7 acres, to result in a degraded soil condition on completion of a project. Thus, the proposed amendment allows an estimated 22 acres, or 0.06%, of NFS lands in the watershed to be in a degraded soil condition on completion of the project.

Severe disturbances such as soil mixing or displacement would reduce long-term site productivity by displacing the duff layer and soil surface (A horizon), thus reducing the soil's ability to capture and retain water and nutrients. As a result, sites with long-term detrimental soil conditions would have interrupted hydrologic function and poor site productivity. Compacted and/or displaced soils may increase runoff and sediment transport and have lower rates of vegetative recovery. Without mitigation, bare soil surfaces in granitic or serpentine soils can persist more than 50 years following a severe disturbance.

Environmental consequences associated with 22 acres of additional detrimental soil conditions in the project right-of-way in the Elk Creek–South Umpqua River watershed include:

- **A potential localized increase in sediment mobilization.** Pacific Connector selected the project route to avoid areas with a high likelihood of geologic hazards. No landslides have been identified that pose a threat to the project. The project right-of-way does not cross earthflow (a type of landslide) terrains in the watershed. Effective erosion control measures and BMPs are required, as shown in the ECRP. Additionally, the project would comply with Umpqua National Forest LRMP Standards and Guidelines for maintenance of effective ground cover. As a result of the dispersal of effects by the linear nature of the project, maintenance of effective ground cover, required application of BMPs, ridge-top location, lack of stream crossings, minimal effects to Riparian Reserves, and implementation of erosion control methods, it is highly unlikely that amending the Umpqua National Forest LRMP to exceed the soil disturbance thresholds by 22 acres would result in the mobilization of sediment that would change the existing equilibrium described in the Elk Creek watershed analysis.

- **A potential localized increase in peak flows.** The Elk Creek watershed analysis recommended site-specific evaluation of the potential for peak flows as a result of canopy removal. The project would remove canopy on about 33 acres or about 0.9% of NFS lands in the Elk Creek–South Umpqua River watershed. Analysis by FERC showed that the project was highly unlikely to contribute to increases in peak flows because of the small area affected by the project as a proportion of the watershed (FERC 2009). Additionally, the entire project right-of-way in the watershed lies on ridge-top locations that have minimal, if any, interactions with aquatic systems since no streams intersect with the project right-of-way in the watershed. As a result, it is highly improbable that the project would change flow regimes from current conditions or from those described in the watershed analysis. See also FEIS, chapter 4.4, for a discussion of peak flows.

- **A potential loss of site productivity, which may slow vegetative recovery.** Granitic and schist soils such as those found in the watershed are typically low in productivity. Without mitigation, these soils can remain barren for 50 years when severely disturbed. Mechanically decompacting the soil to a minimum depth of 20 inches and reestablishing soil organic matter would be a critical first step in rehabilitating the soil toward a more natural condition. Soil rehabilitation would also require recovery of the soil biology, which requires restoration of the soil organic matter and time. Pacific Connector would decompact the right-of-way, fertilize disturbed areas, reestablish native vegetation (limiting the area directly over the pipe to grasses and shrubs), and scatter slash and LWD across the site to provide for long-term nutrient cycling, as required in the ECRP.

Off-site mitigation measures contribute to further reducing these watershed effects. Road decommissioning is planned on 5.95 miles (approximately 35 acres) in the watershed as part of the mitigation plan for the project. Storm-proofing is recommended for 9.21 miles. Decommissioning and storm-proofing roads reduces sediment by reestablishing effective ground cover, increasing infiltration on decommissioned roads, and increasing the road prism drainage capacity while lowering erosion on storm-proofed roads. Decommissioning and storm-proofing roads also contributes to reducing peak flow effects by reducing road-stream interactions, increasing infiltration, and reestablishing natural drainage. It also reduces compaction and helps offset the estimated 10 to 12 acres of the project right-of-way in the watershed that may be in a degraded soil condition on completion of the project.

Off-Site Mitigation measures

Management recommendations that are pertinent to the project from the Elk Creek watershed analysis are summarized below. The congruence of the project with each recommendation is noted. Numbering coincides with that in the watershed analysis.

Landscape Recommendation 5. Reduce fragmentation across the landscape.

- **Project:** The project proposes to fund mitigation measures designed by the Forest Service that would reduce fragmentation at a landscape scale. In Elk Creek, these include:
    - **Commercial thinning of approximately 91 acres.** Commercial thinning has the effect of moving stands past the stem-exclusion stage by removing excess stems. It reduces fragmentation by effectively aggregating stands, creating more uniform age class distribution, maintaining stands in a healthy condition, and reducing the probability of stand-replacing fire.
    - **Off-site pine removal on approximately 300 acres**. Stand-density management is proposed in pine plantations that were planted with off-site seedlings. The purpose of this mitigation action is to restore stand density, species diversity, and structural diversity to those considered characteristic under a natural disturbance regime by enhancing and accelerating the physical and biological diversity for associated flora and fauna within LSR 223.
    - **Fuels reduction on approximately 176 acres.** Both mature stands and developing stands will be removed during pipeline construction. Impacts to mature and developing stands will exceed the life of this project by many decades. Density management will increase longevity of existing mature stands by reducing losses from disease, insects, and fire. Density management in younger stands will accelerate development of LSOG. Associated fuel reductions reduce risk of loss to fire and reduce potential fire size and intensity. Biological resources are not compensated for by land allocation change.

Removal of LSOG is essentially a permanent loss. Young stands will take 70 years to develop into LSOG, so this is not a one-to-one replacement. LSR assessments have identified the importance of density management to control losses to stand-replacing fire. In order to effectively offset permanent loss, entire stands need to be treated so that habitat over time becomes contiguous and is in proximity to the project. The proposed ridge-top pipeline route intersects an area that has had reoccurring lighting strikes and has a potential for stand-replacing fires. This mitigation will assist in protection and restoration of the late-seral forest values. This mitigation provides multiple resources values for the LSR, Forest, adjacent private landowners, and public.

- **Decommissioning approximately 5.9 miles of roads.** Decommissioning roads reduces fragmentation by returning the road corridor to a forested condition.
- **Storm-proofing approximately 9.21 miles of roads.** Storm-proofing will increase the drainage capacity of the road prism while decreasing erosion.

Landscape Recommendation 8. Retain higher levels of LWD during regeneration harvest than have been left historically to favor long-term site productivity, aquatic resources, wildlife, and vegetation processes. Historically, temporal and spatial variability has been extreme. That variability should be perpetuated.

- **Project:** Placement of LWD back on the project right-of-way according to Forest Service standards when construction is completed is part of the ECRP POD filed with FERC and included in appendix F of the FEIS.

Landscape Recommendation 22. Channel extension occurs across the landscape in the Elk Creek–South Umpqua River watershed. Channel extension can be reduced by adding culverts, drain dips, and other drainage structures to existing roads, which help interrupt the direct stream extension by dispersing the water on the hillside at desired locations rather than channeling it into existing streams. Obliterating roads would reduce road densities and decrease channel extension.

- **Project**: Consistent with this recommendation, roads used by the project to access the project right-of-way and components would be upgraded and maintained as needed. Pacific Connector has also committed to fund decommissioning of 5.95 miles of roads in the Elk Creek–South Umpqua River watershed.

Landscape Recommendation 24. Roads that remain open in the watershed should be storm-proofed to reduce road failures and the sedimentation produced by them. Drainage structures should be upgraded to pass 100-year flood events.

- **Project:** In response to this recommendation, Pacific Connector has committed to fund 9.21 miles of road storm-proofing in Elk Creek–South Umpqua River watershed.

Landscape Recommendation 26. Prescribed fire should be used, alone or with tree cutting, to restore nutrient cycles, reduce non-sustainable fuel accumulations, and create conditions that are favorable to the establishment and recruitment of non-conifers and conifers. Considering that the native plant community has already been altered, the objective should be to favor development of a new plant community that replicates the function of the pre-management community. The forests in the Elk Creek–South Umpqua River watershed evolved with fire as a fundamental process and, with proper management, fire can be the best tool for restoring ecosystem functions.

- **Project**: Prescribed fire is proposed in the Elk Creek–South Umpqua River watershed as part of the fuels reduction in the mitigation plan adopted by Pacific Connector.

Project Recommendation 2. Silvicultural prescriptions should meet management objectives in the context of site conditions and historic fire processes. However, deviation from this generality is acceptable to retain the stand- and landscape-level complexity. Generally, stands should be restored to a species composition and structure that are more sustainable and typical of native forests prior to fire suppression.

Project Recommendation 3. Second-growth stands, plantations, and selectively harvested stands are overrepresented in the landscape. These features have a narrow window of silvicultural treatment and should be treated to meet stand structure and composition objectives and avoid undesirable mortality. However, some dense stands and patches in stands should be retained across the landscape to retain diverse habitats.

Project Recommendation 4. Non-commercial thinning should be accomplished with KV collections whenever possible.

Project Recommendation 5. Stand density management has a much greater benefit to tree growth and stand differentiation, species composition, and forest health than does fertilization. Timber stand improvement money is limited. This money should be spent on thinning rather than fertilization.

Project Recommendation 6. Reforestation prescriptions and stocking objectives should be tailored to meet site-specific objectives. If soil and watershed conditions require rapid recovery of conifer canopy and root-site occupancy, then high initial stocking is appropriate. If large trees, structural diversity, and species diversity throughout the life of the stand are required, then high initial stocking is not appropriate. Precommercial thinning can effect changes in stand structure and development, but adequate funding is unlikely.

Project Recommendation 7. Reduce stand density to retain old ponderosa and sugar pines and recruit young ones, ideally at the stand rather than at the individual tree level.

- **Project:** Proposed mitigation measures for fuels reduction (176 acres), commercial thinning (91 acres), removal of off-site pine (300 acres), and reforestation of the project right-of-way are all responsive to recommendations 3, 4, 5, 6, and 7 above. Fuel reduction with periodic underburns reduces stand density and helps to restore fire-dependent ecosystems while reducing the probability of a landscape-level stand-replacing fire. Removal of off-site pine (pine plantations that are not adapted to the site where they were planted) provides a mechanism to restore ponderosa and sugar pines that are adapted to the site. Reforestation of the project right-of-way would follow these recommendations.

Specific Recommendations for Drew Creek and Upper and Lower Elk Creek Subwatersheds

Most of these subwatersheds are part of the South Umpqua River/Galesville LSR. Any management activities in these subwatersheds should meet the objectives and follow the guidelines in the South Umpqua River/Galesville LSR.

- **Project:** Proposed mitigation measures for the project in Elk Creek–South Umpqua River include fuel reduction, commercial thinning, meadow restoration, road decommissioning, noxious weed treatment, and off-site pine removal. These actions are all consistent with the recommendations in the South Umpqua River/Galesville LSR.
    - The Late Successional Reserve Assessment (LSRA)also recommends that trees over 80 years old not be cut. It is likely that a small percentage of the trees in the shaded fuel break proposal would be over 80 years old. In this circumstance, trees greater than 80 years old would be removed only where necessary to achieve the fuel break objectives. The project would also remove an estimated 65 acres of trees older than 80 years from LSR 223 (includes both Elk Creek–South Umpqua River and Cow Creek watersheds) on the Umpqua National Forest. In this case, it is not possible to build the project without removing trees older than 80 years. Standards and guidelines for new developments in LSRs make provisions for utility corridors in LSRs.
    - The natural meadows in these two subwatersheds, in particular Drew Meadows and Callahan Meadows, provide significant habitat for many wildlife and plant species. Impacts on these natural meadows have included harvesting, road construction, grazing, and the establishment of non-native species. Restoration of these natural meadows can include burning, reseeding with native species, and reducing encroachment by conifers.
- **Project:** The mitigation plan filed by Pacific Connector includes approximately 101 acres of meadow restoration in Callahan Meadows and in the Lower Elk Creek sixth-field watershed.
    - The noxious weed eradication program should be continued on a regular basis. St. John’s wort is of particular concern in Callahan Meadows.
- **Project**: The project right-of-way lies entirely on ridge tops in these subwatersheds to avoid side-hill areas prone to management-caused landslides. The mitigation plan filed by Pacific Connector includes approximately 1.75 miles of road storm-proofing in the Lower Elk Creek subwatershed and 2.7 miles in the Upper Elk Creek subwatershed. Shaded fuel breaks with underburning, meadow restoration, off-site pine removal, and precommercial thinning in LSRs all serve to restore upland processes.

Summary of Mitigation Actions. The applicant-filed mitigation plan includes the following activities in the Elk Creek–South Umpqua River watershed that are consistent with recommendations in the Elk Creek watershed analysis (see section 2.2.3.2 of this appendix for a more complete description of these mitigation measures).

- 5.9 miles of road decommissioning. Decommissioning and planting selected roads in conjunction with precommercial thinning treatments (see other mitigation measures) would block up forested habitat and reduce edge effects and fragmentation in a period of about 40 years. Removal of culverts and roadbeds in Riparian Reserves reduces sedimentation of the waters.

- 9.2 miles of storm proofing. Storm-proofing improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed.
- 176 acres of fuel reduction primarily along the ridge top between Elk Creek and Cow Creek. Fuel breaks help reduce the potential for large-scale, stand-replacing fire. At the landscape scale, this contributes to the maintenance of the canopy.
- Two sites for water source improvement projects. Construction of the pipeline and associated activities will increase fire suppression complexity. Pump chances increase the capacity for agency response and help reduce potential fire losses to valuable habitats by providing readily available water sources.
- 91 acres of commercial thinning. Commercial thinning has the effect of regulating stand density, accelerating the development of larger trees, and reducing the stand-replacing fire hazard by regulating stand density and ladder fuels.
- 99 acres of log placement in upland units. This measure restores LWD in old harvest units that are currently devoid of this habitat element. LWD also contributes to long-term soil productivity.
- 68 acres of snag creation. Snags are a critical component of LSR spotted owl habitat, and replacement is needed. Snag requirements are specifically outlined in the Forests' LRMPs and the NWFP. Forests require analysis and mitigation under most management activities.
- 101 acres of meadow restoration at Callahan Meadows. This measure has the effect of restoring native plant communities and controlling invasive weeds.
- 6.7 miles of noxious weed treatment.
- 300 acres of off-site pine removal. This measure removes trees that are not genetically adapted to the site where they are located and provides a mechanism to restore ponderosa pine and sugar pines that are adapted to the site.
- Replacement or improvement of fish passage at five culverts. Restoring stream crossings reconnects aquatic habitats by allowing the passage of aquatic biota and restoring riparian vegetation.
- 99 acres of upland placement of LWD. Mitigate for the loss of recruitment of large down wood to adjacent stands and within the construction clearing zone. Downed wood is a critical component of mature forest ecosystems.

Cumulative Effects

Activities on NFS Lands

The Forest Service manages 63% of the Elk Creek–South Umpqua River watershed. Along with the project, other projects on NFS lands that would contribute to cumulative effects are shown in table 2-20.

TABLE 2-20

Umpqua National Forest Projects That Contribute to Cumulative Effects with the Project in the Elk Creek–South Umpqua River Watershed

Unit	Fifth-Field Watershed	Sixth-Field Watershed	Project Name	Project Description	Resource
UNF	Elk Creek–South Umpqua	Lower Elk Creek	Proposed Elk Creek Collaborative Watershed Restoration Project. Published in program of work 2012. Implementation in 2015.	900 ac. commercial thin, 500 ac. fuels reduction, 250 ac. prescribed burn, 100 ac. pre-commercial thin, 50 ac. weed treatment, 50 ac. planting, 4 culvert replacements, 5 miles road decommission	Upland and riparian vegetation, road network, fisheries/aquatic habitat, water quality
UNF	Elk Creek–South Umpqua	Lower Elk Creek	Current grazing	4,963 ac. cattle grazing	Upland and riparian vegetation, fisheries/aquatic habitat, water quality
UNF	Elk Creek–South Umpqua	Lower Elk Creek	Proposed Tiller Aquatic Restoration Project. Published in program of work 2010. NEPA analysis ongoing. Implementation t in 2013.	2 culvert replacements, 5 miles instream habitat improvement, 4 sump maintenance sites, 86 ac. Riparian Reserve thinning	Riparian vegetation, road network, fisheries/aquatic habitat, water quality
UNF	Elk Creek–South Umpqua	Lower Elk Creek	Anticipated clear cutting on private land	150 ac.	Upland and riparian vegetation, road network, fisheries/aquatic habitat, water quality
UNF	Elk Creek–South Umpqua	Drew Creek	Current grazing	5,000 ac. cattle grazing	Upland and riparian vegetation, fisheries/aquatic habitat, water quality
UNF	Elk Creek–South Umpqua	Drew Creek	Proposed Elk Creek Collaborative Watershed Restoration Project. Published in program of work 2010. NEPA analysis ongoing. Implementation in 2015.	200 ac. commercial thin, 500 ac. fuels reduction, 250 ac. prescribed burn, 100 ac. pre-commercial thin, 50 ac. weed treatment, 50 ac. planting, 2 culvert replacements, 5 miles road decommission	Upland and riparian vegetation, road network, fisheries/aquatic habitat, water quality
UNF	Elk Creek–South Umpqua	Drew Creek	Proposed Tiller Aquatic Restoration Project. Published in program of work 2010. NEPA analysis on going. Implementation in 2013.	2 miles instream habitat improvement, 1 sump maintenance site, 58 ac. Riparian Reserve thinning, 1 pond habitat improvement	Riparian vegetation, road network, fisheries/aquatic habitat, water quality

These projects are expected to be consistent with the Standards and Guidelines and land allocation objectives of the Umpqua National Forest LRMP. Collectively, these projects are expected to improve watershed conditions on NFS lands by:

- Reducing road-related surface erosion sediment.
- Improving aquatic habitat conditions.
- Reducing the risk of catastrophic fire and improving stand health by reducing stand density on existing conifer stands.

Activities on Non-Forest Service Lands

BLM lands account for less than 1%, and private lands comprise about 36% of the Elk Creek–South Umpqua River watershed. There are no projects on BLM lands that might contribute to cumulative effects to the watershed. Private lands in the watershed are expected to be managed according to current land use patterns consistent with the Douglas County General Plan and existing federal and state statutes, including the Oregon Forest Practices Act and the Clean Water Act.

Cumulative Effects

The project right-of-way comprises about 0.09% of NFS lands, 0.61% of the BLM lands, and 0.02% of private lands in the Elk Creek–South Umpqua River watershed (table 2-12). The small proportion of the landscape affected by the project; ongoing land management on private lands; the regulatory framework between the BLM, ODEQ, and ACOE applicable to the project; and project location and routing make it highly unlikely that the portion of the Pacific Connector project on federal lands, when considered with other past, present, and reasonably foreseeable future actions, would change watershed conditions in the Elk Creek–South Umpqua River watershed in any significant, discernable, or measurable way. See also FEIS, chapter 4.14, for a discussion of cumulative effects.

Project Effects Compared by ACS Objective

Table 2-21 shows project effects compared to each of the nine ACS objectives. The project does not cross any stream channels on NFS lands and affects approximately 0.54 acre of Riparian Reserves in the Elk Creek–South Umpqua River watershed. All affected Riparian Reserves are on ridge tops.

TABLE 2-21

Compliance of the Project with ACS Objectives, Elk Creek–South Umpqua River Watershed

ACS Objective	Project Impacts
Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	Riparian Reserves are landscape-scale features that are affected by the project. The project affects (cleared and modified) 0.09% of the NFS land in the Elk Creek–South Umpqua River watershed (table 2-12). No Riparian Reserves are crossed or clipped in the Elk Creek watershed since the project is routed on a ridge top. The application of BMPs and erosion control measures, use of native vegetation, and the anticipated rapid revegetation of disturbed areas would likely further reduce project effects. The level of impact is well within the natural range of variability for disturbance processes described by Everest and Reeves (2007) and Agee (1993) and as documented in the South Umpqua Watershed Assessment (Forest Service 1996).
Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life-history requirements of aquatic and riparian-dependent species.	The project is not expected to impact spatial or temporal connectivity on NFS lands in the Elk Creek–South Umpqua River watershed. No streams are crossed and no riparian reserves are clipped. Aquatic system connectivity would be enhanced by restoring five stream crossings within the watershed. Any residual levels of disturbance are anticipated to be well within the range of natural variability (table 2-17).

TABLE 2-21

Compliance of the Project with ACS Objectives, Elk Creek–South Umpqua River Watershed

ACS Objective	Project Impacts
Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	The project would have no discernible impact on streambanks or bottoms in the Elk Creek–South Umpqua River watershed because no stream channels are crossed. Off-site mitigation measures involving LWD within Riparian Reserves would help restore physical integrity and complexity.
Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	Minor amounts of sediment would be mobilized during construction, but these effects are expected to be short-term and limited to the immediate project area. Connectivity to aquatic systems is limited since no stream channels are crossed. With application of the ECRP and BMPs, there should be no long-term effects associated with sediment transport and delivery. No impacts to water temperature are expected because no channels are crossed and no effective shade is removed. Any sediment transport to aquatic systems that may occur would be offset by off-site road drainage enhancement, surface upgrade, and storm-proofing mitigation projects.
Maintain and restore the sedimentary erosion, transportation and deposition regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.	Areas of unstable soils have been avoided in project routing. There are no stream channels crossed in the watershed and the route lies on a ridge top; therefore, connections to aquatic systems that would transport sediment do not exist. As a result, sediment fluxes are expected to be minor and short-term and well within the range of variability for the Klamath–Siskiyou Province due to implementation of the erosion control measures in thee ECRP, BMPs, and the anticipated rapid revegetation that is characteristic of the province. As a result, erosional effects are expected to consistent with those described in section 1.4.1. Road decommissioning and storm proofing would help reduce sediment effects in the watershed and move the sediment regime closer to the desired condition.
Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.	It is highly unlikely that the project would impact flows because of the lack of connectivity to aquatic systems. The project routing is on a ridge top in the watershed and does not cross any stream channels. The watershed is hydrologically recovered, and the project affects 0.07% of the watershed (table 2-13). In addition, analysis by FERC showed that the project is highly unlikely to contribute to increases in peak flows because of the small area affected by the project as a proportion of the watershed (FERC 2009).
Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	The project would not affect floodplains and water table elevations in meadows because these features are not crossed by the project in the Elk Creek–South Umpqua River watershed.
Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation; nutrient filtering; and appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse, woody debris sufficient to sustain physical complexity and stability.	No vegetation in Riparian Reserves is removed. Existing herbaceous and brush cover would be maintained in Riparian Reserves to the extent practicable. Replanting with native species would facilitate recovery of vegetation communities. LWD placement within 26 acres of Riparian Reserves would help to enhance physical complexity of the aquatic habitats. These restoration efforts, along with the limited effects to which they are directed, would maintain and restore biological and physical functions of the Riparian Reserves in the watershed.
Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	Existing herbaceous and brush cover would be maintained to the extent practicable. To maintain riparian habitat, construction BMPs would be implemented. LWD placement within 26 acres of Riparian Reserves would help to enhance physical complexity of the aquatic habitats. Revegetation would be encouraged by planting of native riparian species. The project would waive application of Management Recommendations for Survey and Manage species in the watershed but would not threaten the persistence of riparian-dependent Survey and Manage species or prevent attainment of the ACS objectives (see appendix F.5).

Summary

It is highly unlikely that project construction and operation would prevent attainment of ACS objectives on NFS land in the Elk Creek–South Umpqua River watershed based on the project's ridge top location and the lack of intersection with waterbodies and the affected Riparian Reserves. Amendments of the Umpqua National Forest LRMP to waive protection measures for Survey and Manage species would not prevent attainment of ACS objectives because the project does not threaten the persistence of any riparian-dependent Survey and Manage species (see appendix F.5). The relatively small amount of Riparian Reserves affected would not be outside the range of variability for disturbance processes in the watershed (see table 2-17).

2.2.1.5 Upper Cow Creek Fifth-Field Watershed, HUC 1710030206

Overview

The Upper Cow Creek watershed is located in Douglas County, Oregon, and covers approximately 47,500 acres. The most common land use in the Upper Cow Creek watershed is forestry, with 98.7% of the land base used for public or private forestry. Agriculture constitutes 1.2% of the land use and mostly occurs along lower Cow Creek. Land ownership is primarily federal (67.0%) and is mostly administered by the Forest Service and BLM. Private landholdings constitute 24.9% of the watershed (Geyer 2003). Below Galesville dam, Cow Creek meanders through the Lower Cow Creek watershed, joining the South Umpqua River at Riddle, Oregon.

The Upper Cow Creek watershed lies within the Klamath-Siskiyou Province, though at its easternmost reach, it has some geologic units typical of the Cascades Province[17], such as igneous rock (granite) and medium-grade metamorphic rock (schist). The elevation of the lowest point in the watershed is 1,780 feet, which is the elevation at the top of the Galesville dam spillway. The elevation of the highest point is 5,095 feet at Cedar Springs Mountain. In the Upper Cow Creek watershed, 95.9% of the land base is above 2,000 feet in the TSZ. Rain-on-snow events may occur in these areas.

Figure 2-4 and table 2-22 show the subwatersheds and ownerships of the Upper Cow Creek watershed. On NFS lands, the project traverses 1.74 miles of the Dismal Creek subwatershed and 2.75 miles of the South Fork Cow Creek subwatershed.

The portion of Upper Cow Creek watershed addressed by the Forest Service in a watershed analysis is located in the southwest corner of the Tiller Ranger District on the Umpqua National Forest. The watershed encompasses approximately 47,499 acres, with 24,151 acres (51%) within the Forest Service boundary. On NFS lands within the watershed, there are 2,350 acres of LSR[18], 19,402 acres of matrix lands[19], and an estimated 7,849 acres of Riparian Reserves. An additional

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[17] Provinces discussed in this document are based on both ecological and geological conditions and therefore do not match those recognized by the Oregon Department of Geology and Mineral Industries and the Oregon State Board of Professional Geologists and Geophysicists. The Klamath-Siskiyou Province is known by professional geologists as the Klamath Mountains Province, and the Western Cascades and the High Cascades are two mountain ranges within the Cascades Mountains Province. See https://www.oregongeology.org/learnmore/geologicsightseeing.htm

[18] LSR values apply only to NFS lands.

[19] Matrix is an NFS land allocation,

645 acres are in unmapped LSRs associated with KOACs [20] on the Umpqua National Forest (table 2-22).

The Upper Cow Creek watershed is primarily within the Klamath-Siskiyou Province, with a small area on the southeastern edge that lies within the Western Cascades Province. Eighty-nine percent of the watershed is either granite or schist. These soil types are susceptible to higher erosion and landslide potential (Forest Service 1995a).

There are an estimated 129 miles of streams within the Forest Service boundary in the Upper Cow Creek watershed. The watershed no longer supports anadromous fisheries due to the construction of the Galesville dam in 1985. Approximately 38 miles are Class II streams (resident fish), with resident cutthroat and rainbow trout. Canopy coverage in the smaller streams and tributaries to Cow Creek is high, which indicates adequate shade (75 to 100%). In the mainstem of Cow Creek, the canopy opens up and Cow Creek widens downstream as the channel becomes less constricted. Stream temperatures are cool throughout most of the watershed; they begin to rise in the wide, shallow part of the mainstem of Cow Creek. The maximum recorded stream temperature is 75°F in lower Cow Creek (Forest Service 1995a).

Location and Routing

To the maximum extent possible, the alignment is located on ridge tops to avoid impacting Riparian Reserves. The project right-of-way originally proposed in the East Fork Cow Creek was located on a large upland feature known as Long Prairie and had no intersections with stream crossings or other Riparian Reserves. After consultation with the Forest Service and The Cow Creek Band of Umpqua Tribe of Indians, the routing was shifted to avoid a culturally sensitive area (Long Prairies). Pacific Connector’s proposed alignment to avoid this area was filed in the September 2007 FERC Certificate application. However, after completion of the 2008 northern spotted owl surveys, it was determined that the proposed 2007 route crossed a northern spotted owl nest area. In consultation with the U.S. Fish and Wildlife Service and the Forest Service, Pacific Connector developed a re-route to avoid the nest area and to minimize effects on suitable northern spotted owl habitat. That route crossed several Riparian Reserves and was parallel to the riparian area associated with the East Fork Cow Creek. (FERC 2009). In 2010, at the request of the Forest Service, a minor realignment was also completed between MP 109.71 and MP 109.78 to avoid areas of potential instability in the vicinity of the crossings of East Fork Cow Creek and several tributaries. This route was proposed by the proponent in its 2017 Application and considered as part of the proposed route analyzed by FERC in its 2019 DEIS. Concurrent with its comments on the 2019 DEIS, Pacific Connector and the Forest Service determined that an additional realignment between MP 109.65 and 109.85 would be preferable for both resource protection and constructability reasons. Specifically, this alignment reduced impacts on Riparian Reserves, Survey and Management species, water quality, and slope stability by replacing two crossings considered in the 2019 DEIS with two new crossings.

The proposed project enters the Upper Cow Creek watershed at MP 102.6 and travels approximately 5.27 miles in a south-southeasterly direction, exiting the watershed at MP 111.1 (figure 2-4). From approximately MP 102.6 to approximately MP 109, the project right-of-way would be located on the ridge top between the Elk Creek and the Upper Cow Creek fifth-field

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[20] Known Owl Activity Centers (KOACs) are only relevant on NFS lands.

watersheds. In all, approximately 5.26 miles of the PCGP corridor are in the Upper Cow Creek fifth-field watershed (table 2-23), 2.51 miles are in the Dismal Creek subwatershed, and 2.75 miles are in the South Fork Cow Creek subwatershed. On NFS lands, approximately 4.5 miles of the PCGP corridor are in the watershed, with 1.74 miles in the Dismal Creek subwatershed and 2.75 miles in the South Fork Cow Creek subwatershed. Between MP 109 and 110, one small forested wetland and two intermittent and four perennial stream crossings occur. Riparian Reserves associated with one perennial stream and six forested wetlands would be clipped by construction clearing of the corridor and TEWAs but the wetlands would not be crossed by the PCGP trench. The Cow Creek watershed analysis estimated that 49%, or approximately 4,559 acres, of the South Fork Cow Creek subwatershed are Riparian Reserves, of which approximately 35%, or 1,595 acres, are LSOG (Forest Service 1995a: 94–95).

Currently, there are approximately 9,441.60 acres of LSOG on NFS lands in the Upper Cow Creek watershed. Approximately 10 acres, or 0.13%, of the Riparian Reserves on NFS lands in the Upper Cow Creek fifth-field watershed would be cleared. Of the cleared Riparian Reserves, approximately 3.73 acres are LSOG. Early- and mid-seral forest vegetation constitutes the remainder of the affected Riparian Reserve vegetation (tables 2-22 through 2-25).

Portions of the routing between MP 109 and MP 110 in the South Fork Cow Creek subwatershed cross areas mapped as dormant earthflow terrain. Field investigation by licensed geologists and geotechnical engineers from the Forest Service and Pacific Connector have shown that these areas are in fact dormant and unlikely to be reactivated by PCGP construction (GeoEngineers 2009, Hanek 2011, NSR 2015). Since these earthflow features are not unstable, they do not meet the definition of Riparian Reserves.

Table 2-26 provides the stream crossing and turbidity risk ratings for the Upper Cow Creek watershed in the blue, yellow, and green categories.

Figure 2-4 PCGP Routing and Subwatershed Boundaries, Upper Cow Creek Watershed

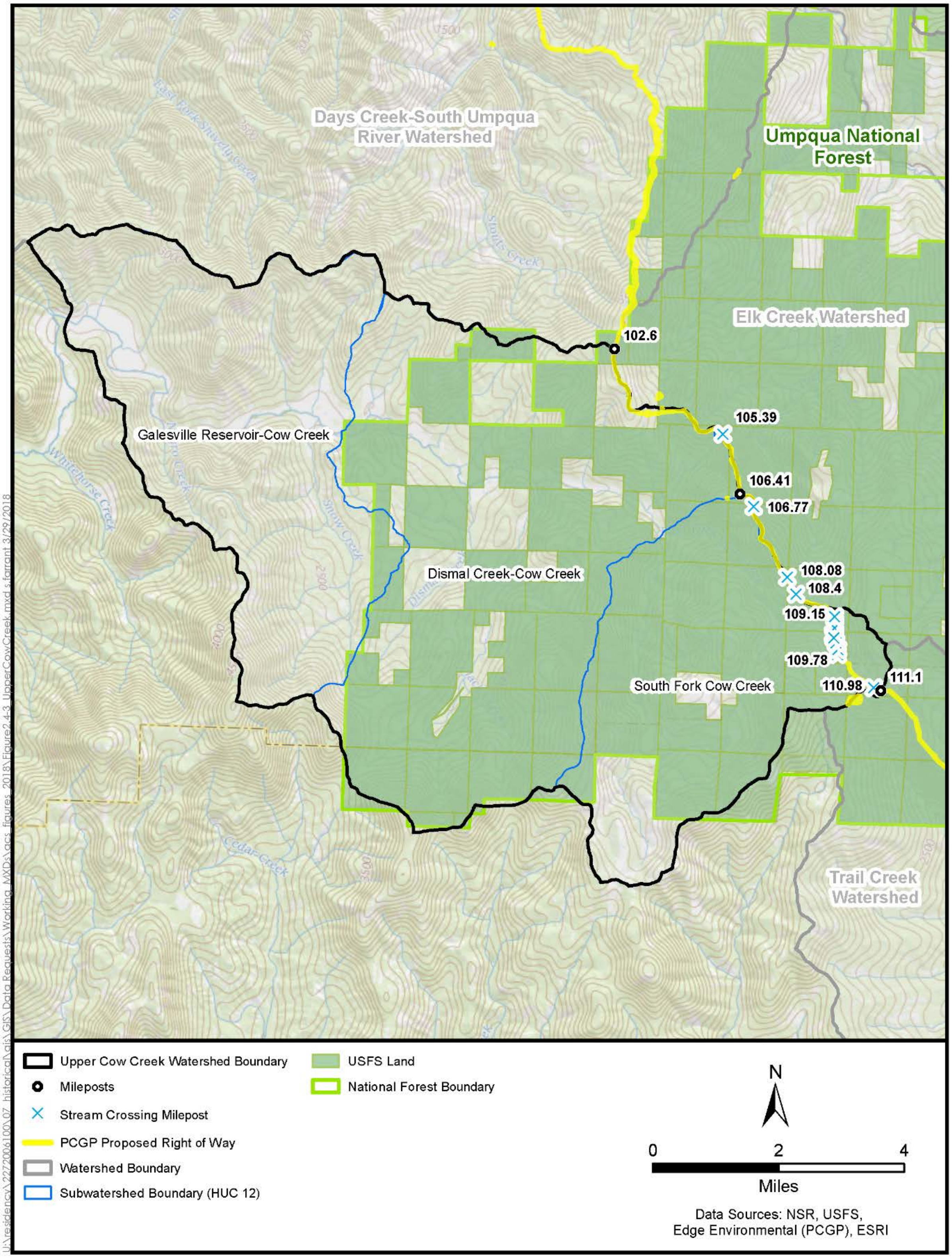

TABLE 2-22

Land Ownership and Forest Service Land Allocations (acres) in Upper Cow Creek Fifth-Field Watershed (HUC 1710030206)

	Land Ownership (acres)					Forest Service Land Allocation (acres)		
Sixth-Field Watershed	**Sixth-Field Watershed (acres) a/**	**NFS Land**	**BLM**	**Total NFS and BLM**	**Other**	**LSR**	**Riparian Reserves b/**	**Matrix**
Dismal Creek-Cow Creek	21,230.73	14,529.21	887.54	15,416.75	5,813.98	1,078.98	4,478.21	12,985.03
Galesville Reservoir-Cow Creek	15,134.85	311.16	8,461.92	8,773.08	6,361.77	0.00	110.65	211.59
South Fork Cow Creek	11,133.85	9,310.97	516.57	9,827.54	1,306.31	1,271.42	3,260.26	6,205.37
Watershed Total	**47,499.43**	**24,151.34**	**9,866.03**	**34,017.37**	**13,482.06**	**2,350.41**	**7,849.12**	**19,401.99**

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a/ All data derived from Stantec-based GIS layers.
b/ May occur within other NFS land allocations.

TABLE 2-23

Project Corridor (miles) and Project Area (acres) in Upper Cow Creek Fifth-Field Watershed (HUC 1710030206) by Land Ownership

	Land Ownership							
	NFS Lands				Entire Sixth-Field Watershed			
		Project Area (acres)				Project Area (acres) b/		
Sixth-Field Watershed a/	**Corridor Length (miles)**	**Cleared**	**Modified**	**% of NFS Land Impacted**	**Corridor Length (miles)**	**Cleared**	**Modified**	**% of Sixth-Field Watershed Impacted**
Dismal Creek-Cow Creek	1.74	26.22	0.00	0.18	2.51	40.94	0.00	0.19
Galesville Reservoir-Cow Creek	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
South Fork Cow Creek	2.75	47.52	1.34	0.52	2.75	47.52	1.34	0.44
Watershed Total	**4.49**	**73.74**	**1.34**	**0.31**	**5.26**	**88.46**	**1.34**	**0.19**

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a/ All data derived from Stantec-based GIS layers.
b/ Includes NFS, BLM, and other ownerships.

TABLE 2-24

Project Area (acres) on NFS Lands in the Upper Cow Creek Fifth-Field Watershed (HUC 1710030206) by Land Allocation

Sixth-Field Watershed a/	Designated LSR b/				Matrix				Riparian Reserves b/			
	Project Area (acres)		% of Total LSR on NFS Land		Project Area (acres)		% of Total Matrix on NFS Land		Project Area (acres)		% of Total Riparian Reserves on NFS lands c/	
	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified
Dismal Creek-Cow Creek	22.98	0.00	2.13	0.00	3.26	0.00	0.02	0.00	1.59	0.00	0.04	0.00
Galesville Reservoir-Cow Creek	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
South Fork Cow Creek	13.72	0.00	1.08	0.00	33.79	1.34	0.54	0.02	8.41	0.26	0.26	0.01
Watershed Total	**36.70**	**0.00**	**1.56**	**0.00**	**37.05**	**1.34**	**0.19**	**0.01**	**10.00**	**0.26**	**0.13**	**<0.01**

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a/ All data derived from Stantec-based GIS layers.
b/ Includes mapped and unmapped LSR on NFS lands.
c/ Riparian Reserve acres overlap with LSR and matrix land allocations.

TABLE 2-25

Riparian Reserve Effects, Upper Cow Creek Fifth-Field Watershed, HUC 1710030206

Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (acres) c/ f/														Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats c/	Gross Riparian Reserves	fish bearing	Anadromy d/
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80 years +)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80 years)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40 years)	Stream Channel or Wetland Area	Net Riparian Reserve Cleared						
Dismal Creek Subwatershed HUC 171003020602																												
UNF	105.39	CDX050	1-4' wide roadside ditch, 20% gradient; extends off-site	D	Yes	10.34		No				**0.00**				**0.00**				**0.00**		**0.00**		0.00		0.00	No	No
South Fork Cow Creek HUC 171003020601																												
UNF	106.77	CDX049	1-2' wide ditch, 2-5' bankfull, 5-10% Gradient	D	Yes	10.34		No				**0.00**				**0.00**				**0.00**		**0.00**		0.00		0.00	No	No
UNF	108.08	CDX047	2' wide roadside ditch,5-10% gradient; dissipates in forest	D	Yes	3.19		No				**0.00**				**0.00**				**0.00**		**0.00**		0.00		0.00	No	No
UNF	108.40	CDX048	2' wide roadside ditch;10% gradient	D	Yes	7.12		No				**0.00**				**0.00**				**0.00**		**0.00**		0.00		0.00	No	No
UNF	109.15	GDX 015	Connects to GW014.	W	Yes	8.27	0.09	No				**0.00**				**0.00**				**0.00**		**0.00**		0.00		0.00	No	No

TABLE 2-25

Riparian Reserve Effects, Upper Cow Creek Fifth-Field Watershed, HUC 1710030206

									Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (acres) c/ f/																			
Jurisdiction	**MP**	**Waterbody**	**Description**	**Waterbody Type**	**Crossed a/**	**Width of Crossing (feet)**	**Wetland Acres Crossed**	**Clipped b/**	**RR_Conifer_LSOG**	**RR_Hardwood_LSOG**	**RR_Mixed_Conifer_Hardwood_LSOG**	**Total_LSOG (80 years +)**	**RR_Conifer_MS**	**RR_Hardwood_MS**	**RR_Mixed Conifer Hardwood MS**	**Total Mid-Seral (40-80 years)**	**RR_Conifer_ES**	**RR_Shrub_ES**	**RR_Grasslands**	**Total Early Seral (0-40 years)**	**Stream Channel or Wetland Area**	**Net Riparian Reserve Cleared**	**Uncleared Storage Area in RR**	**Total Direct Impact in RR (Cleared plus UCSA)**	**Roads and Other Altered Habitats c/**	**Gross Riparian Reserves**	**fish bearing**	**Anadromy d/**
UNF	109.17	GW014/FS-HF-C Trib to East Fork Cow Creek	Seep wetland with shrubs, crosses road and continues. USFS considers this wetland as a perennial stream.	P	Yes	12.02		No				**0.00**	1.54			**1.54**	0.29	0.09		**0.38**	0.03	**1.95**		1.95	0.04	1.99	Yes	No
UNF	109.24	FS-HF-D	Small wetland adjacent to ROW	W	No	0.00		Yes				**0.00**	0.85			**0.85**				**0.00**		**0.85**		0.85		0.85	No	No
UNF	109.29	FS-HF-E	Skunk cabbage seep wetland on NFS land adjacent to ROW	W	No	0.00		Yes				**0.00**	0.08			**0.08**				**0.00**		**0.08**		0.08		0.08	No	No
UNF	109.32	GW017	Forested wetland seep	W	No	0.00		Yes				**0.00**				**0.00**				**0.00**		**0.00**		0.00		0.00	No	No
UNF	109.33	GSI016/FS-HF-F Trib. to East Fork Cow Creek	3’ wide, intermittent	I	Yes	7.54		No				**0.00**	0.80			**0.80**	0.13			**0.13**		**0.93**		0.93	0.22	1.15	No	No
UNF	109.43	GW018	Wetland seep	W	No	0.00		Yes				**0.00**				**0.00**				**0.00**		**0.00**		0.00		0.00	No	No
UNF	109.47	GW021	Emergent wetland seep, connects to GSP019	W	No	0.00		Yes				**0.00**				**0.00**				**0.00**		**0.00**		0.00		0.00	No	No

TABLE 2-25

Riparian Reserve Effects, Upper Cow Creek Fifth-Field Watershed, HUC 1710030206

									Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (acres) c/ f/																			
Jurisdiction	**MP**	**Waterbody**	**Description**	**Waterbody Type**	**Crossed a/**	**Width of Crossing (feet)**	**Wetland Acres Crossed**	**Clipped b/**	**RR_Conifer_LSOG**	**RR_Hardwood_LSOG**	**RR_Mixed_Conifer_Hardwood_LSOG**	**Total_LSOG (80 years +)**	**RR_Conifer_MS**	**RR_Hardwood_MS**	**RR_Mixed Conifer Hardwood MS**	**Total Mid-Seral (40-80 years)**	**RR_Conifer_ES**	**RR_Shrub_ES**	**RR_Grasslands**	**Total Early Seral (0-40 years)**	**Stream Channel or Wetland Area**	**Net Riparian Reserve Cleared**	**Uncleared Storage Area in RR**	**Total Direct Impact in RR (Cleared plus UCSA)**	**Roads and Other Altered Habitats c/**	**Gross Riparian Reserves**	**fish bearing**	**Anadromy d/**
UNF	109.47	GSP019/FS-HF-G East Fork Cow Creek	Cow Creek – 28' wide, broad, cobbles, boulders	P	Yes	26.44		No				**0.00**				**0.00**	1.87			**1.87**	0.06	**1.93**		1.93		1.93	Yes	No
UNF	109.49	GW020	Emergent wetland seep	W	No	0.00		Yes				**0.00**				**0.00**				**0.00**		**0.00**		0.00		0.00	No	No
UNF	109.58	East Fork Cow Creek	Riparian Reserve associated with EF of Cow Creek, clipped.	P	No	0.00		Yes			0.38	**0.38**				**0.00**	0.69			**0.69**		**1.07**		1.07	0.19	1.26	Yes	No
UNF	109.74	ASP297/ EFCC-2 Trib. to East Fork Cow Creek	Perennial stream on NFS land	P	Yes	5		No	1.18			**1.18**				**0.00**				**0.00**	0.03	**1.18**		1.19	0.27	1.46	Yes	No
UNF	109.68	GSP022/ EFCC-1 East Fork Cow Creek	Perennial stream on NFS landwillow-dominated wetland	P	Yes	8		No								**0.00**	0.46			**0.46**		**1.73**		1.73		1.73	Yes	No
UNF	110.98	ESI068/FS-HF-N East Fork Cow Creek	EF Cow Creek ephemeral drainage, U-shaped, cobble, 1-2' wide	I	Yes	16.41		No				**0.00**	1.10			**1.10**				**0.00**	0.03	**1.13**		1.13		1.13	No	No

TABLE 2-25

Riparian Reserve Effects, Upper Cow Creek Fifth-Field Watershed, HUC 1710030206

Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (acres) c/ f/														Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats c/	Gross Riparian Reserves	fish bearing	Anadromy d/
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80 years +)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80 years)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40 years)	Stream Channel or Wetland Area	Net Riparian Reserve Cleared						
Subtotal South Fork Cow Creek		**Crossed:** 3 Ditches f/ 4 Perennial Streams 2 Int. Streams 1 Wetland	**Clipped:** 6 Wetland RR 1 Perennial RR		**7**		**0.09**	**7**	**2.43**	**0.00**	**0.38**	**2.81**	**4.37**	**0.00**	**0.00**	**4.37**	**3.41**	**0.09**	**0.00**	**3.50**	**0.15**	**10.83**	**0.00**	**10.83**	**0.72**	**11.55**	**4**	**0**
Total Upper Cow Creek		**Crossed:** 4 Ditches 4 Perennial Streams 2 Int. Streams 1 Wetland	**Clipped:** 6 Wetland RR 1 Perennial RR		**7**		**0.09**	**7**	**2.43**	**0.00**	**0.38**	**2.81**	**4.37**	**0.00**	**0.00**	**4.37**	**3.41**	**0.09**	**0.00**	**3.50**	**0.15**	**10.83**	**0.00**	**10.83**	**0.72**	**11.55**	**4**	**0**

a/ "Crossed" indicates that the pipeline trench crosses the waterbody or wetland.
b/ "Clipped" indicates that the pipeline corridor crosses a portion of the Riparian Reserve, but the pipeline trench does not cross the associated waterbody.
c/ Roads and other altered habitats such as rock pits sometimes occur within Riparian Reserves. These features do not have riparian features and are not considered as part of the Riparian Reserve vegetated area.
d/ "Anadromy" means that a stream contains anadromous fish or that it is a tributary that directly influences an anadromous stream.
e/ Ditches do not create Riparian Reserves and are shown as 0 acres. They are not included in tallies of water body crossings in the body of the table.

TABLE 2-26

Stream Crossing Turbidity and Risk Rating, Upper Cow Creek Fifth-Field Watershed

Fifth-Field Watershed	**Sixth-Field Subwatershed**	**MP**	**Type a/**	**Description a/**	**Bankfull Width (ft) b/**	**Width of Crossing (ft) a/**	**Channel Gradient (%) b/**	**Channel Incision (ft) b/**	**Bank Character b/**	**Streambed Material b/**	**Turbidity Rating c/**	**Site Response Rating d/**	**Construc-tion Impact Rating d/**	**Overall Rating e/**
Upper Cow Creek	SF Cow Cr.	109.17	P	HF-C Perennial stream with associated seep wetland with shrubs	5	12.02	18.6		Erodible	Sand	M	M	M	YELLOW
Upper Cow Creek	SF Cow Cr.	109.47	P	HF-G Cow Creek – 28' wide, broad, cobbles, boulders,	12	26.44	3.32	3.5	Erosion resistant	Cobble/boulders	M	M	H	GREEN
Upper Cow Creek	SF Cow Cr.	109.74	P	EFCC-1 Perennial stream – willow-dominated wetland	8	8	5		Highly erodible	Cobble	M	M	H	GREEN
Upper Cow Creek	SF Cow Cr.	109.68	P	EFCC-2 Perennial Stream	12	5	10		Erosion resistant	Large cobble	M	L	M	BLUE

Sources:
a/ Table 2A-3a, Resource Report 2, Water Use and Quality, PCGP 2013
b/ Table A-2, Stream Crossing Risk Analysis, GeoEngineers 2011
c/ Table B-1, Turbidity, Nutrients and Water Quality Analysis, GeoEngineers 2011
d/ Table A-1, Stream Crossing Risk Analysis, GeoEngineers 2011
e/ Figure 4, Stream Crossing Risk Analysis, GeoEngineers 2011

Existing Conditions

Original Watershed Analysis Findings

The Forest Service completed a watershed analysis for the Upper Cow Creek watershed in 1995 (Forest Service 1995a). The Umpqua Basin Watershed Council completed a second analysis that covered all ownerships in 2003 (Geyer 2003). Watershed conditions are summarized as follows:

- The Cow Creek fifth-field watershed is primarily composed of granitic and schistose soils that are highly erosive and susceptible to sliding and scouring. Localized ancient dormant earthflow terrains are also represented on the pipeline route in the East Fork Cow Creek.

- Timber harvest and roads in steep terrain have significantly increased the rate of landslides in the watershed. The floods in 1964, 1974, and 1980s and the large storm event on January 9, 1995, caused many timber harvest- and road-related slides.

- The erosive nature of the soils in this watershed is reflected in high levels of sediment transport, storage, and delivery to various waterbodies, particularly in those subwatersheds prone to landslides, debris flows, and debris torrents (saturated debris flows). Historically, sediment delivery has probably always been high; however, human activities such as road construction, timber harvesting, mining, and grazing have increased landslide, debris flow, debris torrent, and general sedimentation rates over natural levels (Forest Service 1995a: 8).

- Timber harvest and fire suppression have altered the frequent low-intensity fire disturbance regime that dominated Sierran-Steppe mixed forests of the Klamath-Siskiyou eco-region represented in the Upper Cow Creek watershed. The result of this changed disturbance regime is a fragmented landscape, low in both early- and late-seral vegetation. The density and dominance of tolerant conifers are high, commonly at the expense of intolerant conifers and most hardwoods. Fire hazard and the magnitude of insect and disease activity may be higher than before modern management (Forest Service 1995: 8, Forest Service et al. 1998).

- The East Fork Cow Creek appears to have been in equilibrium (neither degrading nor aggrading) at the time the watershed analysis was completed with respect to sediment transport, delivery, and storage. Dismal Creek is aggrading and appears to be out of equilibrium with respect to sediment transport and storage (Forest Service 1995a: pg. 49). The lower parts of Cow Creek, the Applegate drainage, and Dismal Creek are primarily storage systems; fine sediments are stored in pools and behind large woody material, reducing spawning substrate and pool habitat (Forest Service 1995a).

- The watershed analysis documented that shade cover on streams was above 80% for the lower order reaches (first, second, and third), averaging 88% for the fourth-order reaches and 52% for the fifth-order reaches of Cow Creek. Water temperatures and canopy suggest good stream shading in the watershed (Forest Service 1995: 51). For the watershed analysis, 12 water temperature monitoring stations were established in the streams in the Cow Creek watershed during summer 1995. Providing one summer's data was not meant to represent a baseline; however, this monitoring data indicated that the maximum water temperature on the East Fork Cow Creek above the confluence with the South Fork Cow

Creek was 55 to 60ºF or below. The Umpqua Basin Watershed Council (Geyer 2003) collected temperature data from 89 continuously sampling data loggers from sites throughout the Cow Creek watershed during summer 2000. Data from the East Fork mouth, downstream of the project crossing, indicated that the maximum temperature was 61.6ºF. There were 74 days where the temperature exceeded 55ºF, but there were no days where the temperature exceeded 64 ºF.

- A portion of the project crosses the East Fork Cow Creek drainage area in the South Fork Cow Creek subwatershed. The Cow Creek watershed analysis provides the following characterization of the drainage:
    - The watershed is highly roaded with a density of 4.7 road miles/mile. Road densities are likely generating sediment that contributes to winter erosion. Sediment storage is high, but may be in the range of equilibrium for granite-schist landscapes (see figure 2-5.) Water temperatures in this drainage were low. Continuous water temperature monitoring results identified 60ºF as the high recorded for the 1995 summer. LWD is limited, possibly as a result of flood flows that reactivated woody debris in the streambanks and from woody debris transported in debris flows and torrents in storms of 1964 and 1974 (Forest Service 1995a: 63).

Figure 2-5 Natural Turbidity and Stored Sediment in East Fork Cow Creek

Changes in Watershed Condition

Since the watershed analysis was written in 1995, peak-flow events in 1997 and again in 2003 caused several road crossing failures. A lightning storm caused the Stouts Fire to begin near the confluence of Stouts Creek and the South Umpqua River on July 30, 2015. This fire grew very quickly over the first several days and was not contained until early September 2015. Overall, the fire burned 26,452 acres of BLM, NFS, and private land and impacted resources associated with LSRs and Riparian Reserves. A total of 1.56 miles are crossed by the PCGP corridor within the burned area of the Upper Cow Creek watershed. The fire burned 147 acres of the Dismal Creek and South Fork Cow Creek subwatersheds. The Forest Service BAER team identified issues from the fire involving seedling planting, noxious weeds, soil stabilization, road/trail water diversion, tree hazard removal, and monitoring. In November 2015, Stantec biologists, foresters, and geomorphologists conducted a field review of the burned area and surrounding watersheds. In conjunction with the data from the BAER reports, it was determined that the burn severity was moderate (25–50% of canopy cover mortality). The Stouts Fire Supplement to Appendix J of the 2015 Final EIS contains more details on the Stouts BAER report, as well as the post-fire watershed projects that were implemented. Prior to this fire, the Forest Service and BLM had completed restoration projects between 1995 and 2015, which are shown in table 2-27.

TABLE 2-27

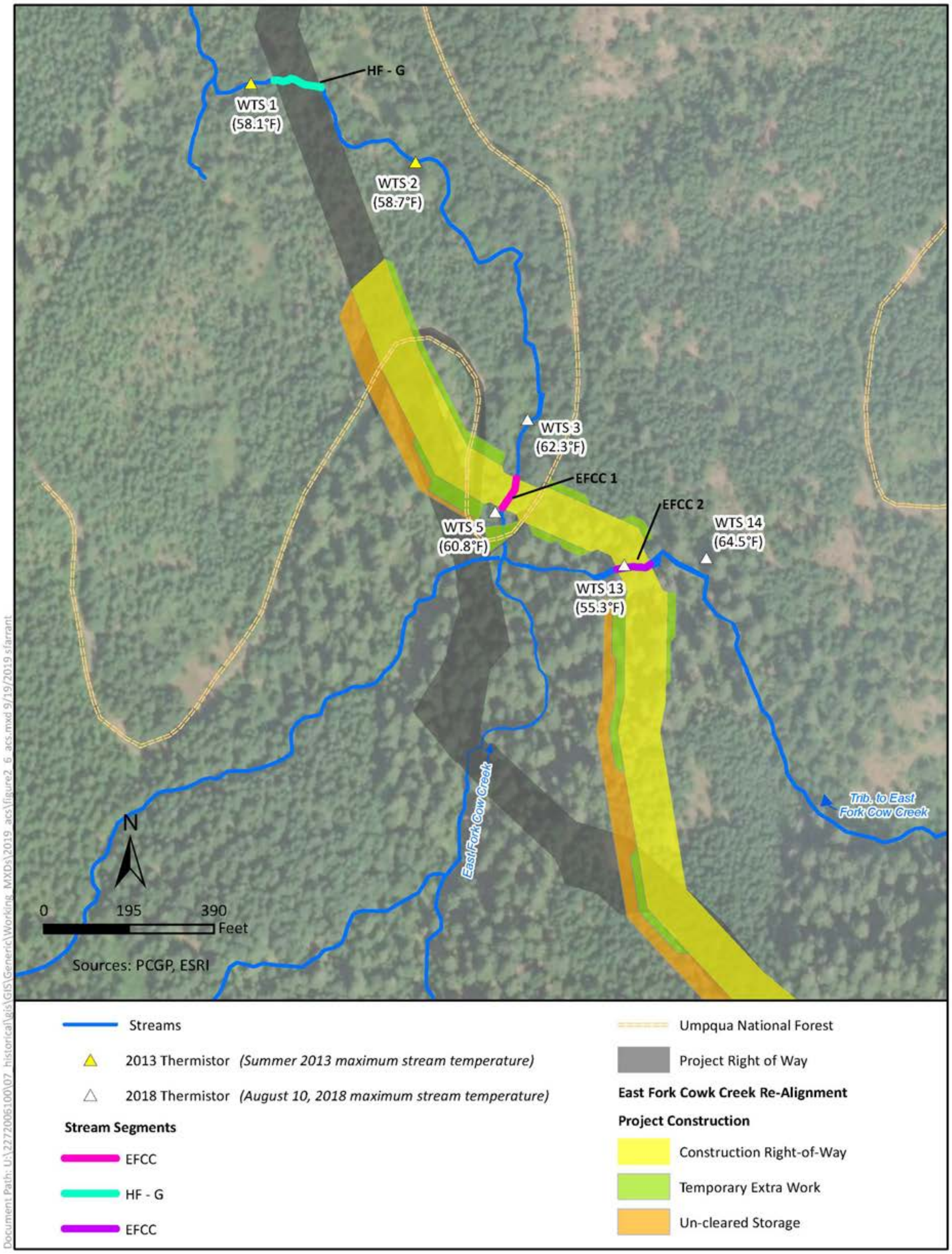
Activities in Cow Creek since Publication of the Cow Creek Watershed Analysis, September 1995

Name	Activity Type	Dates	Total Acres/Miles	Location
Stouts Fire	Wildfire	2015	147 ac	Upper Cow Creek
Eight County Hazardous Fuels Reduction	Pile burning	2010	68 ac	Upper Cow (5th)
Eight County Hazardous Fuels Reduction	Precommercial thin	2009–2010	68 ac	Upper Cow (5th)
Devils Flat Fuelbreak	Precommercial thin	2007	180 ac	Dismal (6th)
Cattle Grazing	Cattle grazing	1995–2012	8,250 ac	South Fk. Cow (6th)
Off-Site Pine	Precommercial thin	?	40 ac	Dismal (6th)
Wildfire	Wildfire	1992–2012	27 ac	Dismal (6th)
Weed Treatment	Hand pull/cut	1997–2012	685 ac	Upper Cow (5th)
Kirby Road	Road construction	2001	<1 ac	South Fk. Cow (6th)
Apple Jack Salvage	Commercial thin	1997	60 ac	Dismal (6th)
Reforestation	Tree planting	1996–2003	450 ac	Upper Cow (5th)
Skeleton Salvage	Commercial thin	1997	20 ac	Dismal (6th)
ERFO Road Repair	Road repair	1995–2006	3 ac	Upper Cow (5th)
Clearcutting on Private Land within District Boundary	Clearcut	1995–2012	889 ac	Dismal (6th)
Commercial Thinning on Private Land within District Boundary	Commercial thin	1999–2006	258 ac	Dismal (6th)
Road Maintenance	Brushing, grading, resurfacing	2010–2012	70 mi	Upper Cow (5th)

Current Watershed Conditions

Generally, conditions described in the 1995 Cow Creek watershed analysis were still applicable prior to the 2015 Stouts Fire. In 2010, the Forest Service rated the watershed Condition Class of Upper Cow Creek watershed as "Functioning at Risk," noting positive attributes for water quality and quantity and riparian vegetation and "Functioning at Risk" or "Not Properly Functioning" ratings for aquatic habitat, aquatic biota, and road density. Road-related sediments and culvert blockages have negatively affected aquatic habitats in the Upper Cow Creek watershed. Forest Service LRMP monitoring data showed positive trends for overall watershed condition. Figure 2-6 shows current (2018 water year) 7-day averages of maximum water temperatures (Stantec 2019). The 2015 BAER team suggested that high-intensity fire coupled with extensive increases in sediment supply was expected to degrade watershed conditions.

Figure 2-6 Current 7-Day Average Maximum Temperatures, East Fork Cow Creek Perennial Streams



Natural Disturbance Processes

Natural disturbance processes for the Upper Cow Creek watershed are consistent with those described for the Klamath and Western Cascades provinces in chapter 1 of this document. Prior to the advent of successful fire suppression, fire was the dominant process affecting upslope and riparian vegetation above the floodplain. Fire visited many sites as often as every 15 years and rarely missed a site for more than 100 years. The Upper Cow Creek watershed's complex fire regime created an equally complex and diverse landscape and stand-level vegetation (Forest Service 1995a: ES-V). Higher intensity, stand-replacing fires occurred on average about every 150 to 200 years in the western Oregon Cascades (Everest and Reeves 2007). Granitic, dioritic, quartz dioritic, and schistose soils in the watershed are susceptible to high rates of surface erosion and mass wasting, particularly on earthflow[21] terrains and slopes over 60% and likely demonstrated high erosion rates when stand-replacing fires and high-intensity rainfall events overlapped.

Project Effects and Natural Range of Variability

The Upper Cow Creek watershed is an active landscape with respect to erosional processes. The Cow Creek watershed analysis documents a clear cause for concern with respect to surface erosion and sediment transport to stream systems from management actions that disturb or expose soils. The East Fork Cow Creek drainage naturally possesses a high amount of background sediment and is roughly in balance for sediment transport and deposition from granite and schist bedrock (Forest Service, 1995a: 63). Given the historic processes that have increased surface erosion, transport, and delivery in the Upper Cow Creek watershed and the fact that the project would further increase the level of surface disturbance, aggressive erosion control and streambank/streambed stabilization measures would be required to maintain the present sediment balance in the East Fork Cow Creek and its tributaries. Additionally, there is a need to avoid mobilizing naturally occurring mercury that occurs within the watershed. Historically, water temperatures in Upper Cow Creek have been in the range of 55°F to 60°F. There are five central concerns related to project effects and compliance with the ACS in this watershed.

1. Whether the clearing for the project would cause excessive erosion and sediment deposition and whether that sediment would aggregate downstream since there are several stream crossings in a short distance in the same stream system.

GeoEngineers completed a crossing risk analysis for turbidity, crossing construction impacts, and potential site response (see section 1.3) (GeoEngineers 2013). Evaluations for stream channel crossings in the East Fork Cow Creek are shown in table 2-27. BMPs that would be applied at each crossing, grouped by "blue," "yellow," and "green" turbidity and risk ratings, are shown in table 2-28[22].

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[21] Earthflows are landslides that have plastic flow due to the cohesive nature of the soils and high soil moisture content.

[22] Note that during preconstruction surveys of crossings, any additional measures needed to accomplish objectives may be stipulated by agency representatives.

- Crossings at MP 109.74 EFCC-2 (perennial) and 111.01 HF-N (perennial stream that is intermittent because of upstream diversion) were rated as low risk where standard stream crossing "blue" BMPs would be applied.
- Crossing at MP 109.17 – HF-C (perennial) were rated as moderate risk for construction impacts and site response where "yellow" BMPs would be applied. The "yellow" BMP group includes additional measures for bank and stream bottom stabilization as needed, including grading or terracing over steepened banks, use of geotextile fabrics and fiber rolls, rock and rip-rap placement, instream structures, stratified backfill, structural fill placement, and LWD, etc. (table 2-28).
- Crossings at MP 109.47 – HF-G and EFCC-1 are classed as "green" crossings, which have a high risk for construction impacts to aquatic habitats. These crossings would add placement of rootwads and large wood as needed for stabilization of banks along with standard BMPs and those in the "yellow" group.

TABLE 2-28

Pacific Connector Proposed BMPS for Use at Waterbody Crossings

	Best Management Practices for Project Typical "Blue" Crossings and for All Other Crossings	**Best Management Practices for Moderate Risk "Yellow" Crossings**	**Best Management Practices for High Habitat Risk "Green" Crossings**
	Crossing MP 109.74 EFCC- 2, 111.01 (HF-N)	**Crossing MP 109.17 (HF-C)**	**Crossing MP 109.47 (HF-G,109.68 EFCC-1)**
Streambed	• Dry ditch crossings (5) • Backfill to match existing streambed gradation, composition as much as possible • Profile restored to existing profile and grade • Stratified backfill for fish-bearing streams	• Dry ditch crossings (5) • Backfill with native material (3, 4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1) • Structural fill placement (2)	• Dry ditch crossings (5) • Backfill with native material (3, 4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1)
Streambanks	• Revegetation with native plant materials (3, 4, 6) • Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment • Widened riparian corridor (federal lands, willing landowners) (3, 6) • Use of fast-growing native tree species to accelerate shading • Placement of large wood and boulders where appropriate • Maintenance of effective cover	• Typical erosion and sediment control BMPs including erosion control blankets, silt fences, etc. • Narrowed construction disturbance (75 feet) corridor where feasible (2, 3, 4) • Narrowed permanent management corridor (2, 3, 4) • Revegetation with native plant materials (3, 4, 6) • Bank graded/terraced to 3:1 (2, 3) • Geotextile reinforced slope (5) • Fiber rolls (3) • Stream barbs/flow deflectors (5) • Toe rock placement (3) • Riprap placement (3) • Biotechnical "vegetation" riprap (3) • Tree revetments (3)	• Typical erosion and sediment control BMPs including erosion control blankets, silt fences, etc. • Narrowed construction disturbance (75 feet) corridor where feasible (2, 3, 4) • Narrowed permanent management corridor (2, 3, 4) • Revegetation with native plant materials (3, 4, 6) **Additional Measures** • Rootwad enhancement of bank stabilization

TABLE 2-28

Pacific Connector Proposed BMPS for Use at Waterbody Crossings

	Best Management Practices for Project Typical "Blue" Crossings and for All Other Crossings	**Best Management Practices for Moderate Risk "Yellow" Crossings**	**Best Management Practices for High Habitat Risk "Green" Crossings**
	Crossing MP **109.74 EFCC- 2, 111.01 (HF-N)**	**Crossing MP** **109.17 (HF-C)**	**Crossing MP** **109.47 (HF-G,109.68 EFCC-1)**
Riparian Vegetation	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (federal lands (3, 6) • Use of fast-growing native tree species to accelerate shading (3) • Entire Riparian Reserve between Hydrofeature EFCC 1 and EFCC 2 should be necked down to 75 feet wide (7) • Helicopter yarding to remove large trees to reduce soil mobilization (7) • LWD on exposed soils in Riparian Reserves to prevent overland flow (7) • Wood chips and other forms of organic mulch should be applied to accelerate soil rehabilitation and the development of effective ground cover vegetation (7)	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (federal lands (3, 6) • Use of fast growing native tree species to accelerate shading (3) • Wood chips and other forms of organic mulch should be applied to accelerate soil rehabilitation and the development of effective ground cover vegetation (7)	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees for willing landowners (3) • Widened riparian corridor (federal lands, willing landowners) (3, 6) • Use of fast-growing native tree species to accelerate shading (3) • Wood chips and other forms of organic mulch should be applied to accelerate soil rehabilitation and the development of effective ground cover vegetation (7) • LWD within Riparian Reserve (360 feet each side of the channel) (7) • Decompact Riparian Reserve using hydraulic shovel with tines to ensure full infiltration of precipitation (7) • Entire Riparian Reserve between Hydrofeature EFCC 1 and EFCC 2 should be necked down to 75 feet wide (7) **<u>Additional Measures</u>** Emphasis on prevention and monitoring for invasive weeds and weed control during revegetation establishment.
Aquatic Habitat	• Stratified backfill for fish-bearing streams (1, 2, 4, 6) • Placement of large wood where appropriate (2, 4, 6)	• Stratified backfill for fish-bearing streams (1, 2, 4, 6) • Placement of large wood where appropriate (2, 4, 6)	• Stratified backfill for fish-bearing streams (1, 2, 4, 6) • Placement of large wood where appropriate (2, 4, 6) **<u>Additional Measures</u>** Rootwad enhancement of bank stabilization
BMP Source	1. FERC Guidelines 2. FEIS chapter 2, Project Description 3. POD attachment, ECRP 4. POD attachment Wetland and Waterbody Crossing 5. POD attachment, ECRP 6. POD attachment Compensatory Mitigation Plan 7. Site Specific Crossing Prescriptions - Perennial Streams on NFS Lands (NSR 2014, Stantec 2019) Representatives of the Forest Service may require additional measures necessary to meet agency standards under the terms of the Right-of-Way Grant.		

In all crossing groups:

- Sediment barriers, including silt fencing, would be installed and maintained until effective ground cover is reestablished. Silt fences have been shown to be up to 95% effective in trapping sediment in the short term (Robichaud et al. 2003).

- Effective ground cover would be in place prior to the onset of seasonal precipitation (table 1-15 in chapter 1 of this appendix).

- Rapid reestablishment of vegetation would be emphasized.

Post-construction, the Forest Service, in consultation with ODEQ, developed the following additional recommendations for this immediate area:

(a) Within Riparian Reserves for all hydrologic features crossed by the pipeline between MPs 109 and 110, provide 100% ground cover on all disturbed areas. Wood fiber is the preferred material. In addition, construct effective water bars at 50-foot intervals.

(b) Within Riparian Reserves for all hydrologic features crossed by the pipeline between MPs 109 and 110, ensure that all erosion control measures are in place before the onset of seasonal precipitation and monitor for rilling, gullying, and other forms of active erosion that may transport sediment into the aquatic environment. If rilling or gullying is occurring that may result in sediment transport into the aquatic environment, immediately take additional erosion control measures to preclude sediment transport.

(c) Until effective ground cover vegetation is established, inspect the construction corridor for sediment transport after each significant storm event (which would be more frequently than a bankfull event) or if there is a visual sediment plume downstream. If the sediment source is originating from the pipeline corridor, add whatever erosion control measures are necessary to preclude sediment transport. This would be done in consultation with the Forest Service. This may include additional silt fencing, aerial placement of ground cover and LWD, mulch, erosion control fabric, or other measures as needed. An authorized Forest Service representative would provide direction to Pacific Connector regarding these events if necessary.

(d) Based on field reviews by the Forest Service, GeoEngineers, NSR, and Stantec, the opinions of these professional engineers, geologists and hydrologists is that the erosion control measures in the ECRP (2019) are expected to be successful. There is, however, potential for incremental and cumulative increases of minor amounts of sediment downstream since all of the crossings in the East Fork Cow Creek occur in the same stream system in close proximity to one another. In order to ensure that sediment during construction and post-construction does not aggregate downstream, the Forest Service would require monitoring of turbidity levels at the farthest upstream crossing of the project and at stream junctures downstream at the time of construction and during post-construction wet weather. If turbidity monitoring shows significant cumulative sediment, as defined by the Forest Service, from project crossings, Pacific Connector would need to take additional steps to reduce erosion from sediment sources. These would include adding appropriate methods noted above or specified by the Forest Service to further reduce the mobilization and transport of sediment.

2. Whether construction activity would intercept groundwater, causing "piping" or otherwise concentrating subsurface flows.

Complex subsurface routing of water is common within dormant earthflow terrains. Stream temperatures in the East Fork Cow Creek suggest groundwater discharge to the streams is influential in this waterbody. GeoEngineers also ranked the crossing at MP 109.47 as "high sensitivity" for hyporheic flows, suggesting surface and ground water fluxes within the riparian zone (GeoEngineers 2013g). There is some possibility that during construction, the project may encounter shallow ground water. Because of the crossing proximity and the infiltration rates of the granitic and schistose soils, pumping water out of the crossing site may simply be moving it to another site or an area of potential instability (e.g., dormant earthflow terrain). If significant shallow ground water is intercepted, the Forest Service and Pacific Connector would agree on a site plan during construction to pump hyporheic flows from the channel to a stable location away from the site in a manner that ensures no surface release to a water body or Riparian Reserve. If post-construction review by the Forest Service representative shows excessive piping (subsurface erosion creating macro-pores or soil pipes) as a result of pipeline construction that is causing resource damage as determined in the field by the Forest Service, Pacific Connector would be required to take additional measures approved by the Forest Service to reduce piping and subsurface erosion. Additional trench blockers may also be necessary in the trench in this area to avoid channeling subsurface flows along the pipeline trench.

3. Whether the dormant earthflow terrains between MP 109 and 111 would remain stable.

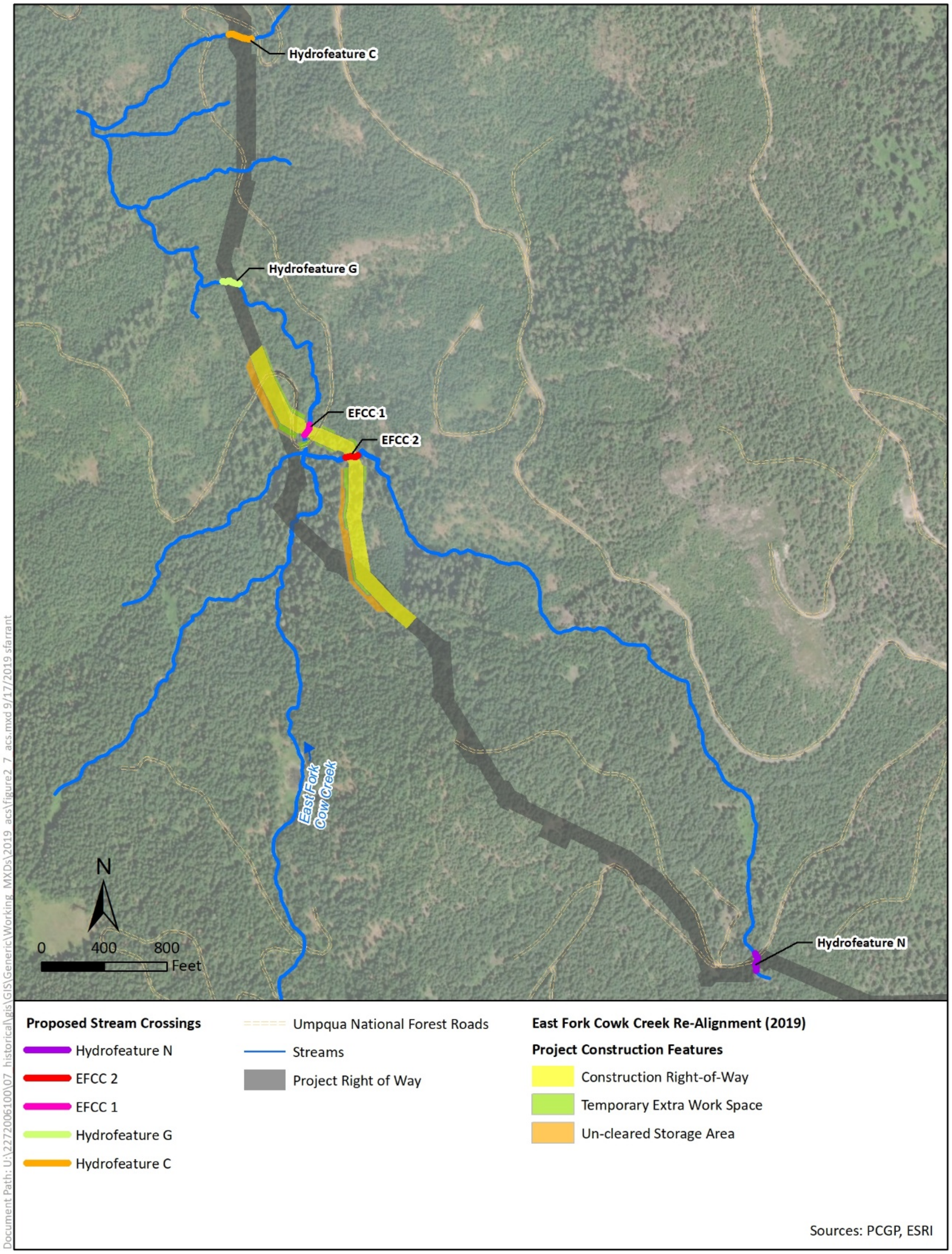
At the request of the Forest Service, both GeoEngineers and NSR (2012, 2014)/Stantec (2019) have conducted additional field reviews in the East Fork Cow Creek watershed to ensure that the project routing would not destabilize earthflow terrains. An Oregon licensed civil engineer from the Forest Service (Hanek 2010), licensed geologists and geotechnical engineers from GeoEngineers (2013), and a licensed geologist from NSR (Koler 2012, 2014)/Stantec (Koler 2019) have concluded that the dormant earthflow terrains are stable due to their large size and the position of the ground water units and that construction is not likely to destabilize them.

4. Whether the loss of effective shade at stream crossings would cause adverse and significant increases in stream temperature at the site of maximum impact or that accumulate downstream.

Stream temperatures are potentially affected by the removal of effective shade. Effects of shade removal depend on stream volume, aspect and stream orientation, and position in the watershed. Loss of effective shade on intermittent streams is not expected to impact water temperature during late summer months when stream temperatures are an issue because most intermittent streams are dry during these months. As illustrated on figure 2-7, with four perennial stream crossings of the East Fork Cow Creek or its tributaries, the possible cumulative impacts of increased stream temperatures are of concern.

Oregon state water quality standards (Oregon Administrative Rules [OAR] 340-041-0028) state that all nonpoint sources taken together at the point of maximum impact may not exceed 0.3°C (0.5°F). The Umpqua Basin TMDL (2006) is more restrictive and allocates the human use allowance to be a 0.1°C increase at the point of maximum impact (i.e., downstream of multiple tributaries impacted by pipeline construction). In addition, all of the stream crossings in the Upper Cow Creek watershed are associated with a waterbody designated as Core Cold Water Habitat (OAR 340-041 figure 320A). The OAR (340-041-0028) states that streams designated with a fish use of Core Cold Water Habitat may not exceed 16.0°C (60.8°F) as measured by the 7-day-average maximum stream temperature. (see www.oregon.gov/deq/Rulemaking%20Docs/figure320a.pdf).

Figure 2-7 Perennial Stream Channel Crossings in the East Fork Cow Creek Drainage



Sources: PCGP, ESRI

To address temperature issues, NSR (2009) conducted a water temperature assessment of the perennial waterbodies crossed within the East Fork Cow Creek drainage to assess the potential effects that the project would have on downstream temperatures based on the proposed alignment at that time. In 2013, NSR (2015) reevaluated hydrofeatures G, J, and K to reflect changes in the pipeline alignment proposed and considered in FERC's 2015 FEIS. In 2019, a minor realignment of the pipeline identified in the field by the Forest Service was accepted by PCGP in their comments on the 2019 DEIS. This realignment resulted in the elimination of two hydrofeatures, J and K, replacing them with two new crossings referred to as EFCC-1 and EFCC-2. This realignment reduces the potential for bank erosion by routing the pipeline to more stable locations. The crossing referred to as EFCC-1 is located in the general vicinity of the intersection of Forest Service Road 3200-500 and East Fork Cow Creek and EFCC-2 is located on a tributary that flows into East Fork Cow Creek upstream of EFCC-1 and to the east. Stantec[23] (2019) conducted a water temperature assessment for the two new crossings (EFCC-1 and EFCC-2) that tiers from the 2015 NSR temperature assessment. Data reported in tables and figures reflect collective results from the 2015 NSR and 2019 Stantec temperature assessment. These water temperature assessments used the valley, stream channel, and riparian zone characteristics of each crossing; measured water temperature trends in East Fork Cow Creek; and used water temperature modeling results to predict the existing and future stream temperature regimes. The evaluation showed that with on-site mitigation measures, any temperature increases would be less than 0.2°C and would be limited to the point of maximum impact. No impacts were predicted at the stream network scale because of the small volume of affected streams, likely groundwater inputs, and the assimilative capacity of the stream network. The results of this evaluation are shown in table 2-29. An implementation and effectiveness monitoring plan would be in place to ensure that these objectives are achieved. If temperatures do increase, Pacific Connector would be required to take additional measures such as planting additional trees or adding LWD to provide additional shade (GeoEngineers 2013f: 26 and FEIS section 4.3.1.5). On-the-ground conditions and water temperature model results suggest that it is unlikely that the stream temperature downstream of any of the perennial crossings would be increased above the ODEQ Core Cold Water Habitat temperature criteria of 16°C (61°F) (NSR 2009, NSR 2015, Stantec 2019).

TABLE 2-29

SSTEMP Model Results for Perennial Stream Crossings in Upper Cow Creek by Hydro-Feature and Reach

Site Data a/	EFCC-1	EFCC-2	Hydro G	Hydro C
Base Flow Discharge (cfs)	0.1	0.02	0.115	0.09
Existing Temperature (°C)	14.3	11.6	15.0	13
Existing Temperature (°F)	57.7	52.9	59.0	55.4
Post-Project Temperature (°C)	15.2	12.6	15.6	20.1
Post-Project Temperature* (°F)	59.3	54.7	60	68.2
Post-project temperature with Mitigation** (°C)	14.4	11.9	15.0	14.1
Post-project temperature with Mitigation** (°F)	58	53.4	59.0	57.3

a/ Hydrofeature N at MP 111.01 is a perennial stream that becomes intermittent in the summer because of an upstream diversion. It would be dry during summer months when water temperature is an issue and is not considered here because its current condition is an intermittent stream.

* Modeled results are based on a 0% predicted shade retention (not including shade from topographic features).

** With mitigation was modeled based on 75% effective shade.

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[23] North State Resources, Inc., was acquired by Stantec Consulting Services Inc. in October 2017.

The Stream Segment Temperature Model (SSTEMP; Bartholow 2002) model was selected for the initial 2009 stream temperature analysis; this model was also used for the 2015 and 2019 modeling efforts because it is the modeling tool most often used by the federal agencies and can provide outputs for single stream segments using available data. Data recorders were placed at various locations upstream and downstream of the proposed stream crossings on East Fork Cow Creek and the tributaries to East Fork Cow Creek, and 7-day average high temperatures were calculated from each data recorder during the warmest part of the summer when the lowest flows occurred. Flows in the 2013 and 2018 data years were about 33% of those modeled in the 2009 data year. These data provided a drought condition assessment of potential project impacts on perennial stream temperatures. To validate the model, measured water temperatures were compared to modeled predicted temperatures under existing conditions. When compared to measured existing conditions, the SSTEMP model overstated actual stream temperature increases by as much as 2.0°F in the 2015 NSR assessment. In Stantec's (2019) assessment, the model was able to predict existing measured temperatures within 0.1°F. If the SSTEMP model overestimated or underestimated the existing condition, then it would also be expected that the modeled post-construction impacts would be overstated or understated by comparable amounts. This highlights the inherent uncertainty and high degree of variability in measuring stream temperatures in low-volume channels.

Modeling of stream temperatures with 0% effective shade retention in the East Fork Cow Creek on the Umpqua National Forest using SSTEMP showed potential temperature increases without on-site mitigation of 1.0°F to 5.1°F.[24] Measured stream volumes ranged from 0.02 cfs to 0.115 cfs, which are very low flows and correlate with modeled temperature increases. While there is a great deal of inherent variation in the stream conditions and a measure of uncertainty in the SSTEMP model results, results of the NSR 2015 and Stantec 2019 analysis suggest that in a low-flow scenario without mitigation, there could be a potential for temperature increases above the TMDL thresholds (0.1°C or 0.18°F at the point of maximum impact) or ODEQ Core Cold-Water Habitat temperature criteria of 16°C (61°F) in small perennial channels in the East Fork Cow Creek watershed.

Table 2-30 shows temperature impacts at Hydrofeature G (MP 109.47), EFCC-1 (estimated MP 109.68) and EFCC-2 (estimated MP 109.74). These data are based on drought-condition flows and near total removal of shading vegetation and are subject to change based on model parameters.

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[24] These results have not been indexed or adjusted to reflect the measured overstatement of impacts by the SSTEMP model noted above. Actual temperature impacts are likely to be less.

TABLE 2-30

Preliminary Assessment of Stream Temperature Impacts at Perennial Stream Crossings in the East Fork Cow Creek

Hydrofeature	**Measured Flow (cfs)**	**Measured Existing Condition 7-Day Max. Temperature Below Crossing (degrees F)**	**Modeled Predicted 7-Day Average Max. Temperature SSTEMP (degrees F)**	**Existing Condition Model Overestimate Compared to Actual Conditions (degrees F)**	**Modeled Post-Construction Average Max. Temperature (degrees F)**	**Modeled Post-Construction Max. Increase in Average Max. Temperature (degrees F)**
EFCC-2 (2018 dat) MP 109.74	0.03	52.9°	53°	+0.1°	54.7°	+1.8°
EFCC-1 (2018 data) MP 109.68	0.1	57.7°	57.6°	-0.1°	59.3°	+1.6°
HF-G MP (2013 data) 109.47	0.115	59.0°	59.2°	+0.2°	60.0°	+1.0°

Data Source: NSR 2015 and Stantec 2019. Table values reflect drought condition flows and 0% effective vegetation shading. Values were not adjusted for likely overstatement of impacts by SSTEMP model onsite mitigation measures to retain or replace existing shade.

Crossing-Specific Preliminary Interpretation Based on NSR 2013 and Stantec 2019 Data

The EFCC-1 crossing at estimated MP 109.74 near the headwaters of East Fork Cow Creek is a north-south facing stream. At the location EFCC-1, East Fork Cow Creek is a perennial stream with an estimated base flow discharge of about 0.1 cfs during low-flow conditions. The summer 2018 water temperature data collected at WTS 3, 140 feet downstream from EFCC 1, recorded a maximum daily average water temperature of 15.3℃ (59.6ºF), recorded on August 10. A maximum hourly temperature of 17.1°C (62.8°F) was also recorded on August 10. The 7-day maximum water temperature (7DMA) was 15.9℃ (60.7ºF) (July 25–July 31) and the highest 7DMA mean water temperature was 14.3℃ (57.8ºF) (July 25–July 31). Estimated existing shade cover at EFCC-1 is between 85% and 95%. A modeled temperature increase of 1.6°F is indicated at this site if all the shade-producing vegetation is removed. With mitigation, establishing effective shade post-construction would likely prevent water temperatures to exceed the Umpqua Basin TMDL of a 0.2°F increase above existing conditions.

The EFCC-2 crossing at estimated MP 109.68 is associated with an east-west facing unnamed tributary that feeds into East Fork Cow Creek upstream of EFCC 1. The confluence of this stream and East Fork Cow Creek is approximately 260 feet downstream of EFCC 2. At the location of EFCC-2, the stream is perennial with an estimated base flow discharge of about 0.03 cfs during low-flow conditions. Temperatures recorded during 2018 indicate cooler water temperatures were recorded at WTS 13 compared to WTS 14, suggesting that groundwater input may be present in the EFCC 2 reach. Based on water temperature data collected at WTS 13 during summer 2018, the maximum daily average water temperature was 12.1℃ (53.7ºF), recorded on August 10. A maximum hourly temperature of 12.9℃ (55.3°F) was also recorded on August 10. The 7DMA was 12.4℃ (54.4ºF) (August 9–15) and the highest 7DMA mean water temperature was 11.6℃ (52.9ºF) (August 9–15). Estimated existing shade cover at EFCC-1 is between 95% and 100%. A modeled temperature increase of 1.8°F is indicated at this site if all the shade-producing vegetation is removed. With mitigation, establishing effective shade post-construction would likely prevent water temperatures from exceeding the Umpqua Basin TMDL of a 0.2°F increase above existing conditions.

Hydrofeature G at MP 109.47 is an east-west oriented crossing and is the downstream-most perennial crossing in the East Fork Cow Creek watershed. Water temperatures recorded in 2013 at this feature decreased from 58.7°F at WTS 2 to 58.1°F at WTS 1. This decrease is likely the result of ground water influences from adjacent wetland complexes. Hydrofeature G is at the toe of a dormant earthflow landscape. GeoEngineers identified this feature as having possible hyporheic influence (GeoEngineers 2013g). This possibility is supported by the measured decrease in water temperature at this location. This feature is partially shaded by dense willows. A modeled temperature increase of 1.0°F is indicated at this feature if all of the shading vegetation is removed. This feature could easily be shaded by the placement of large wood and maintenance or replacement of the willows. If the existing shade condition is restored post-construction, no temperature increase would be expected. If shade is not restored and the modeled temperature increase of 1.0°F is realized, it would increase the 7-day average maximum temperature to 60.0°F at this feature. With this increase, the water temperature would remain below the ODEQ Core Cold-Water Habitat temperature criteria of 16°C (61°F) at this feature.

Discussion

Although exposure to solar radiation may cause temperature increases, temperatures downstream from limited stream-side forested clearings have often been found to cool rapidly once the stream reenters forested regions (Zwienieck and Newton 1999). Other studies have noted downstream cooling below timber harvest areas as well, but the extent of this cooling is not entirely clear and varies by stream (Moore et al. 2005, Poole et al. 2001). Although there is some debate concerning the magnitude of cooling provided by riparian vegetation and the extent to which stream temperatures return to non-cleared temperature levels after exiting a cleared area, studies emphasize that riparian buffers assist in maintaining water temperatures (Correll 1997, Gomi et al. 2006). Generally, temperatures, especially in small streams, may recover quickly with cooler surrounding conditions downstream (e.g., streambed cooling, evaporation, hyporheic inflows, shade). This was validated by stream temperature data recorded and documented in NSR 2015. Field measurements of existing conditions (in 2013) on the Umpqua National Forest showed decreasing stream temperatures of as much as -7.6°F/100 feet, with an overall average over 2,040 feet of the East Fork Cow Creek of -0.1°F/100 feet (NSR 2015). The presence of a number of small wetlands adjacent to the stream channel provides evidence of likely local ground water discharge at springs and seep locations. Most of this 2,040-foot reach of the creek also has substantial shade. This suggests the retention of shading structures, or at least partial shade, may greatly reduce increases in stream temperature. These data also support the NSR 2009 and Stantec 2019 findings that potential temperature increases are partially offset by cooling from ground water interactions in the stream channel.

Observations as part of the NSR 2009 and 2015 and Stantec 2019 temperature assessments show that LWD and low-growing willows, huckleberries, and other brush species can provide effective shade for small, narrow channels. For example, Hydrofeature G at MP 109.47 has dense overhanging willows and other brush species that shade much of the channel. In many cases, low-growing brush outside of the immediate construction area of this feature can be maintained, thus minimizing shade loss. In the mainstem of the East Fork Cow Creek, LWD provides significant shade and creates a complex channel structure with high retention of sand and gravel that helps maintain cooler water temperatures. As described in the POD requirements for the project (attachments ECRP and WWBC), all LWD and boulders removed from the crossings associated with the East Fork Cow Creek and its tributary would be replaced during site restoration and low-growing brush will be retained where it is possible to do so. The features crossed in this watershed vary in width from 2 to 12 feet under baseflow conditions and could easily be shaded by the placement of LWD, larger logs, and willow plantings. Where site-specific modeling suggests temperature increases may be possible, a restoration plan to reestablish pre-crossing shade conditions using willows, logs, boulders, and LWD has been prepared for each of the perennial stream crossings on NFS lands (NSR 2015, Stantec 2019). With the maintenance of existing brush that shades these narrow channels, the placement of LWD, and the replanting of willows and other brush species, downstream temperatures are expected to be very close to the existing condition and to remain below ODEQ thresholds for the waterbodies in the East Fork Cow Creek watershed because these measures would provide immediate and effective shade. In small, first- and second-order streams, any temperature increase that does occur would likely be masked by the assimilative capacity of larger streams at the stream network scale (NSR 2009).

In all cases in the East Fork Cow Creek watershed, ground water discharge, downstream shade, and commingling with other tributaries is expected to limit any temperature increase to the site scale, with no accumulation of temperature increases downstream. However, since there are four perennial stream crossings in the East Fork Cow Creek watershed in less than 1 mile and there is a TMDL threshold established by ODEQ, it is appropriate to require project implementation and effectiveness monitoring. As a final measure to ensure that temperature standards are maintained, the Forest Service would require Pacific Connector to monitor temperatures above and below crossings of perennial streams during and post construction using Forest Service temperature protocols until effective shade is reestablished at perennial stream crossings or until it is evident that stream temperatures remain unaffected. If temperatures or temperature changes exceed TMDL thresholds, Pacific Connector would be required to develop additional mitigation measures in agreement with the Forest Service to further reduce project impacts on stream temperature in this watershed. These measures may include placement of large logs so as to provide effective shade and reduce wetted stream width, and limbs and small logs bridging the channel to provide effective shade or other methods as directed by the Forest Service.

Pacific Connector also assessed potential impacts to stream temperature. Pacific Connector used predictive modeling on a representative cross-section of crossings along the pipeline route, spanning the ecoregions, HUCs, width classes, and aspect classes from Coos Bay to Malin, Oregon, including stream crossings on NFS and BLM lands. Model results show a maximum predicted increase of 0.16°C over one 75-foot clearing. Thermal recovery analysis shows that temperatures return to ambient within a maximum distance of 25 feet downstream of the pipeline corridor, based on removal of existing riparian vegetation over a cleared right-of-way width of 75 feet. Given that mitigation for loss of effective shade would occur and that predictive modeling using SSTEMP shows that the local impacts are small in magnitude and spatially limited, the cumulative effects of the proposed project on the thermal regime in the Coos, Coquille, South Umpqua, Rogue, Klamath, and Lost River basins are expected to be extremely minor and well below detection in the field (GeoEngineers 2013f: 26).

5. Whether ground disturbance associated with PCGP construction could mobilize naturally occurring mercury found in the soils at or near crossings in the East Fork Cow Creek.

The Forest Service contracted with a consulting geologist to collect soil and stream sediment samples for analytical testing and reporting of mercury and other naturally occurring minerals along a 2,000-foot section of the proposed pipeline route between MP 109 and the intersection of East Fork Cow Creek with Forest Service Road 3200-500 (Broeker 2010b, GeoEngineers 2013e). Geochemical analysis of the soil and stream sediment samples have been analyzed, showing that the sediment has very low to nominal concentrations of naturally occurring mercury mineralization. The mercury level at one of the stream sediment sample sites was 0.29 part per million, which was above the Level II screening level value of 0.1 part per million for invertebrates (ODEQ 1998, cited in GeoEngineers 2013d). In order to prevent this naturally occurring mercury from mobilizing during and after construction, additional erosion control measures developed with ODEQ along with monitoring would be conducted at these sites. The proposed pipeline construction activities by Pacific Connector within the upper East Fork Cow Creek watershed are not anticipated to disturb and expose soils and bedrock strata that contain more than low amounts of natural occurring mercury mineralization, and any sediment that is generated is not likely to reach the aquatic environment due to implementation of short-term and permanent mitigation measures outlined in Pacific Connector's ECRP (GeoEngineers 2013e). Pacific Connector would conduct periodic water quality monitoring during and post-construction to ensure that mercury is not mobilized.

Table 2-31 compares the project effects to the historic range of variability for relevant ecological processes in the Upper Cow Creek watershed. These processes have been substantially altered by fire suppression, timber harvest, and road construction.

TABLE 2-31

Project Effects and Relevant Ecological Processes Described in the Upper Cow Creek Fifth-Field Watershed Analysis

Ecological Processes Relevant to the PCGP	Historic Range of Variability	Pacific Connector Effects
Erosional Processes	The Upper Cow Creek watershed has a high frequency of landslides in granitic and schistose soils. When high-intensity rainfall events or rain-on-snow events overlapped with areas burned in high-intensity fires, surface erosion and shallow mass wasting likely increased substantially, resulting in pulses of coarse sediments and LWD to stream channels. Ancient earthflow features (early- to mid-Holocene) exist in the East Fork Cow Creek, but they are currently stable.	All but 1 mile of the 5.26 miles of the PCGP corridor in Upper Cow Creek watershed is on a ridge top. The 1 mile stretch from MP 109 to 110 in the South Fork Cow Creek subwatershed crosses ancient but stable earthflow terrains. Application of measures described in the ECRP and BMPs, including maintenance of effective ground cover in accordance with the Umpqua National Forest land management plan standards (table 1.3.1.2-1) during construction, is expected to minimize the potential for sediment transport to streams. Dry dam-and-pump stream crossing methods described in section 1.3.1 are expected to limit sediment during construction (see section 1.3.1.2). Transport and deposition are currently roughly in balance in the East Fork Cow Creek (Forest Service 1995a: 49). Sediment produced by the PCPG is expected to be short-term during the period of construction and minor (see section 1.3.1.2). The project is not expected to reactivate earthflow terrains or produce sediment amounts that would alter the current balance in the East Fork Cow Creek (Hanek 2011, Koler 2012, NSR 2014). Project impacts are expected to remain within the range of natural variability for the Klamath Province and the erosionally active Upper Cow Creek watershed; however, a potential exists for aggradation of sediment from multiple stream crossings. Therefore, additional post-construction sediment monitoring that may require actions by Pacific Connector would be incorporated into the terms of the Right-of-Way Grant.
Ecological Succession/ Vegetative Condition	Frequent, low-intensity fire with infrequent high-intensity, stand-replacing fires in dry years created a mosaic of open forest dominated by Douglas-fir and pines that ranged from 45% to 75% late successional forest (Forest Service 1995). Landslides associated with unstable granitic and schistose soils occasionally intersected stream channels creating openings in stream-side vegetation. Fire suppression and timber management have reduced and fragmented late-successional stands, reducing patch size, shifting species dominance to white fir, and increasing early- and mid-seral proportions of the drainage. LSOG acres in both upland and riparian areas are below historic averages. Vegetative condition throughout the Upper Cow Creek watershed has been significantly altered by timber management activities.	A total of 1.59 acres (0.02%) of Riparian Reserves would be cleared by the project in the Dismal Creek subwatershed. The project would affect 8.41 acres or 0.26% of Riparian Reserves in the South Fork Cow Creek subwatershed. Of the cleared Riparian Reserves in the watershed, approximately 3.73 acres are LSOG (table 2-25). Loss of LSOG vegetation in the corridor is a long-term impact, but minor in scale, and well within the historic range of vegetative change, given the fire and landslide history of the Upper Cow Creek watershed (see discussion of fire and landslides in watershed assessment). The federal lands in the Upper Cow Creek watershed are currently 36% LSOG and exceed the 15% LSOG threshold stipulated by the NWFP.

TABLE 2-31

Project Effects and Relevant Ecological Processes Described in the Upper Cow Creek Fifth-Field Watershed Analysis

Ecological Processes Relevant to the PCGP	Historic Range of Variability	Pacific Connector Effects
Peak Flow Processes	Most of the Upper Cow Creek watershed lies in the TSZ, where rain-on-snow events can increase the frequency and intensity of peak flows. Harvest units and roads have likely increased the frequency and intensity of peak flow events.	The Upper Cow Creek watershed analysis recommended site-specific evaluation of the potential for peak flows as a result of canopy removal. The PCGP would remove canopy on about 65 acres or about 0.3% of NFS lands in the watershed. Analysis by FERC showed that the project was highly unlikely to contribute to increases in peak flows because of the small proportion of the watershed affected by the project (see FEIS chapter 4.3, also FERC 2009). Additionally, all but approximately 1 mile of the PCGP corridor lies on ridge top locations that have minimal interactions with Riparian Reserves. The portion of the project in the South Fork Cow Creek subwatershed that is not on ridge tops is unlikely to contribute to peak flows because hydrologic connectivity would be minimized by recontouring slopes, decompacting soils, maintaining effective ground cover, and other measures stipulated in the ECRP. Peak flows may increase in the TSZ where less than 75% of drainage is hydrologically recovered because of interactions of roads with stream crossings. Although the project area is in the TSZ, more than 85% of the NFS lands in the watershed are hydrologically recovered (Forest Service 1995a: 95, table 14) and the PCGP affects substantially less than 1% of the drainage. It is highly improbable that the PCGP could affect peak flows in the Upper Cow Creek watershed (see also FEIS section 4.3).
Stream Temperature	Maximum water temperature on the East Fork Cow Creek above the confluence with the South Fork Cow Creek was 55-60°F or below. The Umpqua Basin Watershed Council (2000) collected temperature data from 89 continuously sampling data loggers from sites throughout the Cow Creek watershed during summer 2000. Data from the East Fork mouth, downstream of the project crossing, indicated that the maximum temperature was 61.6°F. There were 74 days where the temperature exceeded 55°F, but there were no days where the temperature exceeded 64°F.	See table 2-29 and the previous discussion in this section. A site-specific evaluation of effects of the PCGP on stream temperature showed that with mitigation measures, stream temperatures at the site scale would be minor or not detectable, with no impact at the network scale, and would not exceed thresholds established by the State of Oregon in a TMDL for temperature in the Umpqua Basin (NSR 2009, NSR 2015, Stantec 2019). Temperatures are expected to remain within the range of natural variability, although there may be minor increases at the point of maximum impact (see also GeoEngineers 2013).
Aquatic Habitat and Stream Channel Complexity	Stream channels had 40-60 pieces of LWD/mile with >30% pool habitat by area. Prior to human impact, beaver dams and high densities of LWD in log jams created complex channels and maintained pools in streams of the watershed. Water was stored in the channel and as ground water in the streambanks and floodplains. This water was slowly released during the summer, thereby sustaining flows. The combination of LWD and streambank vegetation was indicative of relatively stable streambanks and channels that were relatively resilient during floods. Past management practices have simplified channel conditions, removing LWD from channels and eliminated future sources of LWD.	During construction, the project would alter the bed and banks of stream channels and move LWD and boulders as necessary for construction. After construction, these sites would be restored to their preconstruction condition and stabilized as needed by placement of boulders, LWD, and erosion control structures as specified in the ECRP and Wetland and Waterbody Plan; therefore, no long-term effects to aquatic habitat and channel complexity are expected. Effects would be limited to the project scale and would be minor and short-term (typically 1 to 5 days per crossing).

Compliance with Umpqua National Forest Land and Resource Management Plan

Project compliance with standards and guidelines contribute to compliance with the ACS. Where a project does not comply with a standard and guideline, the evaluation must show that non-compliance does not prevent attainment of the ACS. Table 2-32 provides Umpqua National Forest LRMP Standards and Guidelines relevant to the ACS that are applicable to NFS lands in the Upper Cow Creek watershed.

TABLE 2-32

Compliance with Umpqua National Forest LRMP Standards and Guidelines in the Upper Cow Creek Watershed

LRMP Standards and Guidelines	PCGP Compliance
LH-4: Issuing leases, permits, right-of-way and easements.	Terms and conditions to ensure compliance with ACS objectives have been incorporated into the POD prepared by the applicant in conjunction with the BLM, Forest Service, and ACOE and submitted as part of the Right-of-Way Grant application. The POD includes 28 exhibits, including the Wetland and Waterbody Crossing Plan, the Erosion Control and Revegetation Plan, the Hydrostatic Test Plan, the right-of-way Clearing Plan, and the Traffic Management Plan, etc. In the South Fork Cow Creek subwatershed specifically, Pacific Connector has agreed to maintain 100% effective ground cover to prevent surface erosion and minimize the risk of mobilizing naturally occurring mercury.
RA-4: Locating water withdrawal sites.	Pacific Connector has developed a Hydrostatic Test Plan that would minimize any potential short-term effects on stream flows from water discharge events from the project's hydrostatic testing operations. No potential hydrostatic test water sources occur within the Upper Cow Creek watershed; therefore, the biological, physical, and chemical integrity of these systems would remain unaffected by hydrostatic withdrawal activities.
RF-2: Road construction standards and guidelines.	The existing transportation system in the South Fork Cow Creek subwatershed would be adequate for construction of the project. No new temporary or permanent access roads are planned in the South Fork Cow Creek subwatershed.
RF-4: New culverts, bridges and other stream crossings.	No new road crossings of streams are proposed in the watershed. Crossings would be maintained to prevent diversions. Specific specifications in the TMP (see section 2.2.3 and Exhibit F, section F.9.e) require culvert and bridge replacements to meet agency standards and agency approval of plans.
RF-5: Minimizing sediment delivery from roads.	Road maintenance specifications in the TMP require implementation of T-831, T-842, T-811, and T-834, which are maintenance specifications designed to minimize sediment delivery to aquatic habitats; these specifications would be implemented during project construction.
RF-6: Maintaining fish passage.	Fish passage would be maintained at all road crossings where project-related road repairs are implemented. Additionally, PCGP would install four "fish friendly" crossings that meet the current biological opinions of the USFWS and/or NMFS to replace culverts that currently block fish access and limit connectivity of aquatic habitats.
RF-7: Transportation Management Plan development.	The TMP submitted by the applicant and accepted by the Forest Service meets all the requirements of RF-7 in the Upper Cow Creek watershed.
WR-3: Proper use of planned mitigation and restoration.	Application of BMPs and aggressive erosion control measures, restricted construction windows, and numerous other impact minimization measures have been incorporated into several exhibits to the POD to prevent habitat degradation. These measures are not being used as a substitute for otherwise preventable habitat degradation or as surrogates for habitat protection.

TABLE 2-32

Compliance with Umpqua National Forest LRMP Standards and Guidelines in the Upper Cow Creek Watershed

LRMP Standards and Guidelines	PCGP Compliance
Management direction for Survey and Manage Species in the NWFP ROD was replaced by the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines as Modified by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.)	The project affects Survey and Manage species within the Upper Cow Creek watershed. Such effects would be inconsistent with management recommendations in the 2001 ROD to protect known sites of Survey and Manage species. However, the project does not threaten the persistence of any Survey and Manage species (see appendix F.5). Waiving application of Management Recommendations for Survey and Manage species in the watershed would not prevent attainment of any ACS objective.
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth-field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15% or less late-successional forest. (The assessment of 15% will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands. Protection of these stands could be modified in the future when other portions of the watershed have recovered to the point where they could replace the ecological roles of these stands.	Federal lands in the Upper Cow Creek watershed are currently 36% LSOG and exceed this threshold.
New Developments in LSRs	Standards and Guidelines for New Developments in LSRs (NWFP C-17) require effects of developments be minimized and mitigated. Reallocation of matrix lands to LSR (UNF-4) is a mitigation to partially meet this Standard and Guideline. (See appendix K.)
UNF Standards and Guidelines for Effective Ground Cover (Umpqua National Forest Forest Plan IV-67)	Standards and Guidelines for Effective Ground Cover (Umpqua National Forest LRMP IV-67) have been incorporated into the ECRP and are a requirement for the project (table 1-15 and ECRP table 10.15-1). The project would maintain 100% effective ground cover in affected Riparian Reserves in the South Fork Cow Creek subwatershed, which exceeds the requirements of this standard.
UNF Standards and Guidelines Forest Wide Fisheries #1 (LRMP IV-33)	Standards and Guidelines for maintenance of effective shade cannot be met. A LRMP amendment (UNF-1) is proposed to waive application of this standard and guideline.
UNF Prescriptions C2–II (LRMP IV–173) and C2–IV (LRMP IV–177)	Aquatic prescriptions prohibit utility corridors from running parallel to stream corridors. The PCGP runs parallel to the East Fork Cow Creek at MP 109.5 to 109.6. An LRMP amendment (UNF-2) is proposed to waive application of this standard and guideline.
UNF Forest-Wide Soils Standard and Guideline #1 (LRMP IV-67)	The combined total amount of unacceptable soil condition (detrimental compaction, displacement, puddling, or severely burned) in an activity area (e.g., cutting unit, range allotment, site preparation area) should not exceed 20%. All roads and landings, unless rehabilitated to natural conditions, are considered to be in detrimental condition and are included as part of this 20%. Pacific Connector cannot meet this standard. An LRMP amendment (UNF-3) is proposed to waive application of this standard.

Relationship of Proposed LRMP Amendments to the ACS

In the Upper Cow Creek watershed, three amendments to the Umpqua National Forest LRMP have a nexus with the ACS[25]. This section addresses whether implementation of these LRMP amendments would prevent attainment of the ACS.

UNF-1. Amends standards and guidelines for fisheries and water quality to allow the removal of 3 acres of effective shading vegetation where perennial streams are crossed by the PCGP.

Forest-Wide Fisheries Standard and Guideline #1 (Umpqua National Forest LRMP IV-33) states:

> Maintain all effective shading vegetation on perennial streams. Utilize silvicultural practices to establish shade on perennial streams where currently lacking.

The purpose of this standard and guideline is to prevent stream temperature increases caused by the removal of effective shade. The Umpqua National Forest LRMP clearly allows utility corridors to cross riparian areas; however, the PCGP corridor cannot be constructed without removal of effective shade. Amendment UNF-1 allows the removal of effective shade where the PCGP corridor crosses perennial streams on the Umpqua National Forest.

See discussion of effects of shade removal related to stream temperature in section 1.4.1.3 of this appendix.

Based on the limited impact on stream temperature, conditions created by this amendment are not likely to prevent attainment of ACS objectives in the Upper Cow Creek watershed.

UNF-3. Allows the PCGP to exceed restrictions on detrimental soil conditions in the project corridor.

Forest-Wide Soils Standard and Guideline #1 (LRMP IV-67), states:

> The combined total amount of unacceptable soil condition (detrimental compaction, displacement, puddling or severely burned) in an activity area (e.g., cutting unit, range allotment, site preparation area) should not exceed 20%. All roads and landings, unless rehabilitated to natural conditions, are considered to be in detrimental condition and are included as part of this 20%.

Degraded soil conditions may occur in the cleared project areas. On NFS lands in the Upper Cow Creek watershed, approximately 100% (74 acres) of the project right-of-way would be cleared. Degraded soil conditions may result from displacement and compaction following completion of project construction and rehabilitation. Compaction can largely be addressed by subsoil ripping, but displacement would be unavoidable because of the nature of the project. Existing LRMP Standards and Guidelines allow up to 20% of the project right-of-way, or 15 acres, to result in a degraded soil condition on completion of a project. Thus, the proposed amendment allows an

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[25] The 2019 DEIS included amendment UNF-2. This amendment is excluded from the proposed action described in Chapter 2 of the 2019 FEIS due to the route adjustment made; the proposed project would no longer be parallel to the East Fork Cow Creek.

estimated additional 59 acres or 0.24% of NFS lands in the watershed to be in a degraded soil condition on completion of the project.

Severe disturbances such as soil mixing or displacement would reduce long-term site productivity by displacing the duff layer and soil surface (A horizon), thus reducing the soil's ability to capture and retain water and nutrients. As a result, sites with long-term detrimental soil conditions may have interrupted hydrologic function and poor site productivity. Compacted and/or displaced soils may increase runoff and sediment transport and have lower rates of vegetative recovery.

Environmental consequences associated with 59 acres of additional detrimental soil conditions over the corridor in the Upper Cow Creek watershed include:

- **A potential localized increase in sediment mobilization.** Pacific Connector selected the route to avoid areas with a high probability of geologic hazards. No unstable or potentially unstable terrain has been identified that poses a threat to the project (GeoEngineers 2009). The project does cross earthflow terrains in the East Fork Cow Creek, but routing avoided areas of instability on the affected earthflow terrains (Hanek 2011, NSR 2014). To ensure that the project does not initiate instability or mobilize sediment, a site-specific supplement to the ECRP has also been prepared for this area. Erosion control measures associated with this plan include:

  (1) Within Riparian Reserves for all hydrologic features crossed by the pipeline between MPs 109 and 110, provide 100% post-construction ground cover on all disturbed areas. Wood fiber is the preferred material. In addition, construct effective waterbars at 50-foot intervals. These measures have two purposes: (a) preventing soil erosion and (b) preventing the mobilization of naturally occurring mercury found in this watershed.

  (2) At hydrologic feature G, EFCC-1 and EFCC-2 ensure that erosion control measures are in place before the fall rains and monitor for rilling, gullying, and other forms of active erosion that may transport sediment and deposit it into the aquatic environment. If rilling or gullying is occurring that may result in sediment transport and deposition into the aquatic environment, improve erosion control measures to preclude sedimentation.

  (3) Inspect the construction right-of-way for sedimentation after each significant storm event (which would be more frequently than for a bank-full event) or whenever there is a visual sediment plume downstream. If the sediment source is originating from the project right-of-way, improve erosion control measures to preclude sedimentation. An authorized agency representative would provide information to Pacific Connector regarding these events.

- As noted in the Upper Cow Creek watershed analysis, the East Fork Cow Creek already has a high background sediment load. As a result of the dispersal of effects due to the linear nature of the project, maintenance of effective ground cover, the required application of BMPs, and implementation of site-specific erosion control methods, it is highly unlikely that amending the Umpqua National Forest LRMP to exceed the soil disturbance thresholds would result in the mobilization of sediment that would change the existing balance of sediment mobilization and transfer or would exceed the natural range of variability in this watershed (NSR 2014) (see section 1.3.1.1 for a general discussion of erosion control measures).

- **A potential localized increase in peak flows**. The Upper Cow Creek watershed analysis recommended site-specific evaluation of the potential for peak flows as a result of canopy removal. The PCGP would remove canopy on about 65 acres, or about 0.3%, of NFS lands in the watershed. Analysis by FERC showed that the project was highly unlikely to contribute to increases in peak flows because of the small proportion of the watershed affected by the project (see FEIS section 4.4). Additionally, all but approximately 1 mile of the project right-of-way lies on ridge-top locations that have minimal interactions with Riparian Reserves. The portion of the project in the East Fork Cow Creek that is not on ridge tops is unlikely to contribute to peak flows because hydrologic connectivity is minimized by recontouring slopes, decompacting soils, establishing effective ground cover, and other measures in the ECRP. Peak flows may increase in the TSZ where less than 75% of drainage is hydrologically recovered because of interactions of roads with stream crossings. Although the project area is in the TSZ, more than 85% of the NFS lands in the watershed are hydrologically recovered (Forest Service 1995a: 94, table 14), and the project affects less than 1% of the drainage. As a result, it is highly improbable that the project would change flow regimes from current conditions or from those described in the Upper Cow Creek watershed analysis.
- **A potential loss of site productivity, which may slow vegetative recovery.** Granitic and serpentine soils such as those found in the Upper Cow Creek watershed are typically low in productivity. Dormant earthflow terrains such as those found in the East Fork Cow Creek watershed (Umpqua National Forest Soil Type 25) are widely variable, depending on parent materials, but tend to have higher clay content and are generally more productive than granite and schist soils. Mechanically decompacting the soil to a minimum depth of 20 inches and reestablishing soil organic matter would be a critical first step in rehabilitating the soil toward a more natural condition. Soil rehabilitation would also require recovery of the soil biology, which requires restoration of the soil organic matter and time. The project would decompact the corridor, fertilize disturbed areas, reestablish native vegetation (limiting the area directly over the pipe to grasses and shrubs), and scatter slash and shading back across the site to provide for long-term nutrient cycling as required in the ECRP. Additionally, the Forest Service may require soil remediation with other organic material to augment soil productivity.

Off-site mitigation measures contribute to further reducing these watershed effects. Road decommissioning is planned on 2.12 miles (approximately 15 acres) in the South Fork Cow Creek sixth-field watershed as part of the mitigation plan for the PCGP project. Decommissioning roads reduces sediment by reestablishing effective ground cover and increasing infiltration. It also contributes to reducing peak flow effects by reducing road-stream interactions, increasing infiltration, and reestablishing natural drainage. These effects reduce compaction and help offset the estimated 22 acres of project right-of-way in the Upper Cow Creek watershed that may be in a degraded soil condition on completion of the project.

Based on this evaluation, it is unlikely that this amendment would prevent attainment of ACS objectives in the Upper Cow Creek watershed.

<u>UNF-4. Re-allocates approximately 585 acres from matrix to LSR.</u>

Amendment UNF-1 transfers approximately 585 acres of matrix land in the South Fork Cow Creek to LSR. The purpose of this amendment is to offset effects of the PCGP on the LSR land allocation; this reallocation also benefits aquatic ecosystems.

Under this amendment, the matrix lands re-allocated to the LSR land allocation would be managed for late successional and old-growth stand characteristics. LSRs are also an important component of the ACS. The standards and guidelines under which LSRs are managed provide increased protection for all stream types. Because the area selected for reallocation to LSR has late-successional characteristics, it may offer core areas of high-quality stream habitat that act as refugia and centers from which degraded areas can be recolonized as they recover. This amendment contributes to meeting multiple ACS objectives in the Upper Cow Creek watershed.

Off-Site Mitigation Measures

Offsite mitigation is intended to provide supplemental actions for projects that cannot be completely mitigated with on-site design features in order to ensure land management objectives are achieved. These projects also contribute to the “Maintain and Restore” objectives of the ACS. The Forest Service and PCGP have entered into an Agreement in Principle to accomplish off-site mitigation work in the Upper Cow Creek watershed, as shown in table 2-33. Mitigation measures were developed from the recommendations of watershed analyses and assessments, late successional reserve assessments, and the 2008 Northern Spotted Owl Recovery Plan. Mitigation measures in the Upper Cow Creek watershed are focused on integrated projects that are intended to:

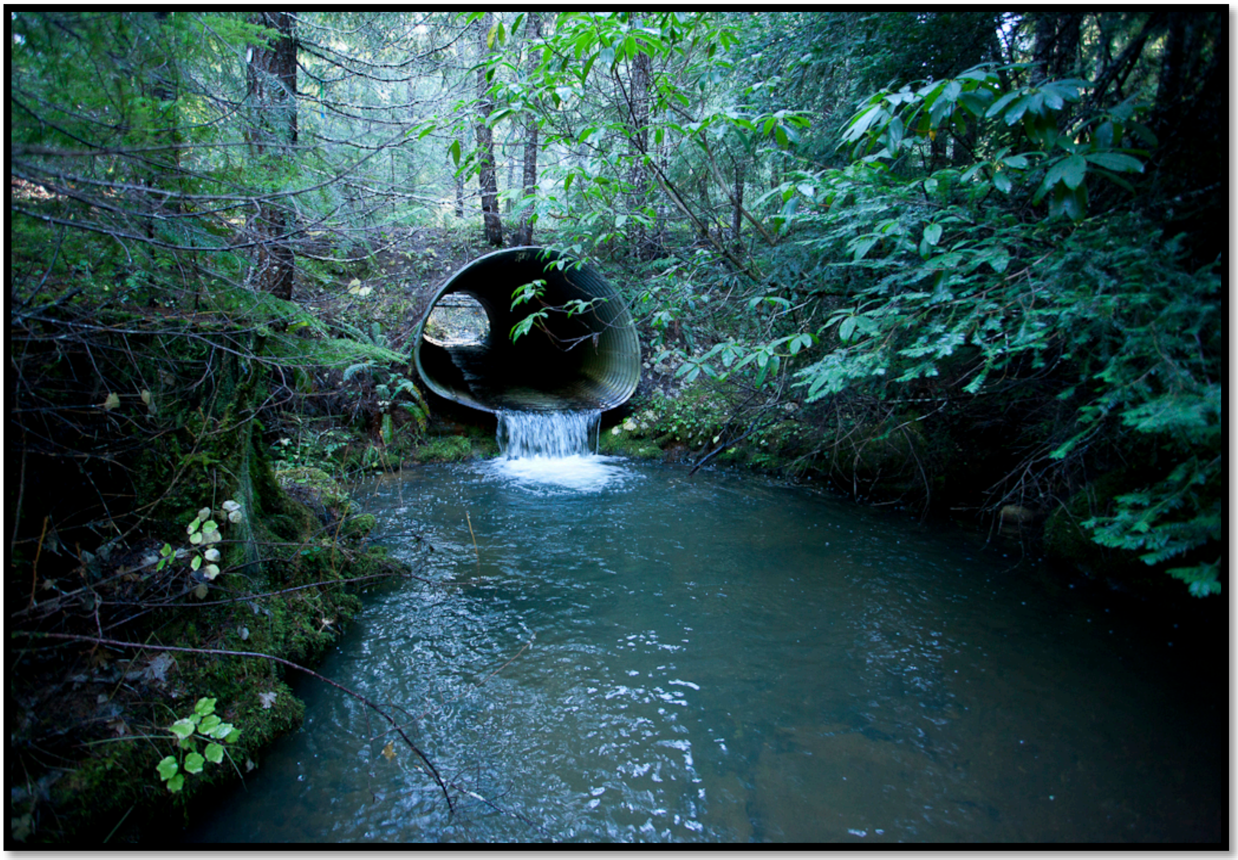
- Restore natural erosional/depositional processes by reducing sediment contributions from roads and potential high-intensity fire.
- Restore historic stand and fuel-density levels to selected stands.
- Restore elements of aquatic and terrestrial habitats.
- Restore access to aquatic habitats that are currently blocked by culverts.

TABLE 2-33

Off-Site Mitigation Measures in the Upper Cow Creek Watershed

Project	**Amount**	**Rationale**
Fish Friendly Passage	6 sites	Poor culvert design, erosion at outlets, and lack of maintenance have resulted in several road-stream crossings that block access to upstream aquatic habitats. Culvert replacements with fish-friendly designs would benefit fish and other aquatic biota by reconnecting habitats and reducing sediment contributions from these locations. This is responsive to ACS objectives 1, 2, 3, and 5.
Road Closure Road Decommissioning	1.2 miles 1 mile	Road density and lack of road maintenance were identified as major sources of sediment in the Upper Cow Creek Watershed Analysis. Decommissioning and closing roads may reduce road-related sediment contributions. This is responsive to ACS objectives 4 and 5.
Fuels Reduction -Shaded Fuel Break	683 acres 378 acres	Forest stands in the Upper Cow Creek watershed are often overstocked with unnaturally high fuel loads that make them susceptible to high-intensity fire. Stand-density fuel-reduction projects were designed to reduce fuel loading and stand density in overstocked, fire-prone stands to historic ranges to reduce the risk of high-intensity, stand-replacing fire. Since these types of fires can be a major cause of surface erosion and mass wasting in granite and schist soils, these projects contribute to reestablishing a natural sediment regime over time by reducing the probability of a large, high-intensity fire in this area. This is responsive to ACS objectives 1, 2, and 5.
Stand Density Management Commercial Thinning Precommercial Thinning	 197 acres 116 acres	Commercial thinning and precommercial thinning are intended to enhance LSOG habitat by increasing the growth, health, and vigor of the trees remaining in the stands and restoring stand density, species diversity, and structural diversity to those considered characteristic under a natural disturbance regime. The project will result in additional fragmentation and preclude the recovery of fragmented habitat for those stands adjacent to the pipeline corridor. Maintenance of the pipeline corridor will provide a continued vector for predators, early seral species, and non-native species. Also, the project will result in a direct loss in biological services provided by mature forest characteristics for many decades past the life of this project. Both mature stands and developing stands will be removed during pipeline construction. Density management of forested stands will assist in the recovery of late-seral habitat, reduce impacts from fragmentation, reduce edge effects, and enhance the resilience of mature stands. Accelerating development of mature forest characteristics will decrease the impacts of loosing mature forests due to pipeline construction. Thinning of young stands is a recognized treatment within LSRs if designed to accelerate development of late-successional habitat characteristics (NWFP ROD pages B-11 and C-12, ACS objectives C-11 and C-17).
Terrestrial LWD LSR Snag Creation Matrix Snag Creation	65 acres 90 acres 11 acres	Logging, fire suppression, and fuels treatments have reduced the numbers of snags and pieces of LWD in the Upper Cow Creek watershed. Portions of snag creation and terrestrial LWD projects in matrix lands and LSRs would occur within Riparian Reserves. This would contribute to ACS objectives for restoring snag levels and down wood to historic ranges in treated areas and is responsive to ACS objectives 1 and 8.
Matrix to LSR Land Reallocation	585 acres	The project crosses LSR acres in the Upper Cow Creek watershed. Matrix to LSR reallocation provides aquatic protections by managing upland areas for LSOG conditions. This is responsive to all 9 ACS objectives.

Figure 2-8 East Fork Cow Creek Culvert. This culvert currently blocks migration of fish and other aquatic biota. It would be replaced by a "fish-friendly" design as part of the mitigation plan proposed by Pacific Connector.



Cumulative Effects

Activities on NFS Lands

The Forest Service manages about 51% of the Upper Cow Creek watershed. Projects on NFS lands that would contribute to cumulative effects along with the project are shown in table 2-34.

TABLE 2-34

Umpqua National Forest Projects That Contribute to Cumulative Effects along with the PCGP in the Upper Cow Creek South Umpqua Watershed

Unit	Fifth-Field Watershed	Sixth-Field Watershed	Project Name	Project Description	Resource
UNF	Upper Cow Creek	South Fork Cow Creek	Proposed Tiller Aquatic Restoration Project. Published in program of work 2010. NEPA analysis ongoing. Implementation in 2013.	1 culvert replacement	Riparian vegetation, road network, fisheries/aquatic habitat, water quality
UNF	Upper Cow Creek	South Fork Cow Creek	Current grazing	7,757 ac. cattle grazing	Upland and riparian vegetation, fisheries/aquatic habitat, water quality

These activities are expected to be consistent with the Standards and Guidelines and objectives of the Umpqua National Forest LRMP.

Activities on Private Lands

Private lands comprise about 28% of the Upper Cow Creek watershed. Private lands in the watershed are expected to be managed according to current land use patterns consistent with the Douglas County General Plan and existing federal and state statutes, including the Oregon Forest Practices Act and the Clean Water Act. Approximately 270 acres of clearcut timber harvest are currently anticipated in the Dismal Creek subwatershed of the Upper Cow Creek watershed. The Pacific Connector route is on a ridge top in the Dismal Creek subwatershed.

Cumulative Effects

The project comprises about 0.3% of NFS lands and 0.11% of private lands in the Upper Cow Creek watershed (table 2-23). The small proportion of the landscape affected by the project; ongoing land management on private lands; the regulatory framework between the BLM, ODWQ, and ACOE applicable to the project; and project location and routing make it highly unlikely that the portion of the project on federal lands, when considered with other past, present, and reasonably foreseeable future actions, would change watershed conditions in the Upper Cow Creek watershed in any significant, discernable, or measurable way. See also FEIS chapter 4.14.

Project Effects Compared by ACS Objectives

Table 2-35 evaluates project effects against each of the ACS objectives. NFS lands where the ACS applies comprise about 51% of the Upper Cow Creek watershed. Timber harvest and removal of LWD from creek channels have reduced the structural complexity of the aquatic habitat and its ability to retain sediments. Chronic, fine-grained sediment deposition, primarily related to roads, has negatively affected aquatic habitats. The presence of roads has segregated some stream reaches from upslope habitats that are needed for replenishment of LWD.

Through application of BMPs and the FERC Wetland and Waterbody Plan, sediment transport would be minimized, the physical integrity of riparian and instream areas would not be compromised, and instream flow regimes would be maintained. No riparian-related Survey and Manage species would be affected by project construction and operation.

TABLE 2-35

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Upper Cow Creek Watershed

ACS Objective	Project Impacts
Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	Riparian Reserves are watershed-scale features that would be affected by the project. There would be four perennial and two intermittent stream crossings in the South Fork Cow Creek subwatershed. [Note that Hydrofeature N at MP 111.01 is a perennial stream but, because of an upstream diversion, it is dry in the summer. It is counted here as an intermittent stream since that it is its current condition]. One small shrub-dominated wetland is also crossed. Riparian Reserves associated with 1 perennial stream and 6 forested wetlands are clipped. The project right-of-way is located primarily in early- or mid-seral forests and largely on or near ridge tops to minimize impacts on aquatic habitats. The project right-of-way would affect 73.76 acres or about 0.31% of NFS lands in the Upper Cow Creek watershed and about 10 acres or 0.13% of the Riparian Reserves within the watershed. Impacts to aquatic systems are expected to be short-term and minor and limited to the project scale because of application of BMPs and erosion control measures. LWD cleared in construction of the corridor would be used to stabilize and restore stream crossings. Off-site mitigation measures including road decommissioning and installation of fish-friendly culverts are expected to improve watershed conditions in the Upper Cow Creek watershed (table 2-33). While there are long-term changes in vegetation in Riparian Reserves from construction clearing of the corridor, these would be minor in scale and well within the range of natural variation given the disturbance history of the Upper Cow Creek watershed.
Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life-history requirements of aquatic and riparian-dependent species.	The project is not expected to affect spatial or temporal connectivity in the Upper Cow Creek watershed except during the construction period because the pipeline would be buried in all aquatic habitats crossed, consistent with the requirements of the Wetland and Waterbody Crossing Plan. In the short-term, connectivity would be disrupted during construction. At each crossing, the corridor would be narrowed to 75 feet wide. Bed and bank disturbances associated with equipment and trenching are small (<15 feet wide). After construction, all disturbed areas would be returned to their approximate original contours to restore preconstruction contours and drainage patterns. The temporary construction right-of-way would be restored and revegetated with native grasses, forbs, conifers, and shrubs, as outlined in the ECRP. After construction, key habitat components such as LWD and boulders would be restored onsite and the bed and banks would be returned to preconstruction conditions. By implementing these measures, lateral and longitudinal connectivity at the site scale would be maintained, although in the short-term during construction, connectivity may be disrupted. With the exception of a few days during the construction of the crossing, access to areas necessary for life-histories of aquatic- and riparian-dependent species would not be obstructed. By restricting stream crossing operations to the ODFW instream work window, possible impacts to sensitive life stages of aquatic biota would be minimized. Connectivity would be improved by installation of fish-friendly culverts at six sites that currently preclude passage of aquatic organisms (see table 1-14). The residual levels of disturbance are anticipated to be well within the range of natural variability in the Klamath–Siskiyou Province.
Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	Impacts to the beds and banks of aquatic features would be minor and limited to the site of construction because the pipeline would be buried and the actual area of bank and stream bottom disturbance associated with equipment crossing and trenching is small at each crossing (<15 feet wide). After construction, key habitat components such as LWD and boulders would be restored onsite and the beds and banks would be returned to preconstruction conditions, consistent with the POD requirements. By implementing these measures, the physical integrity of the aquatic system at the site scale would be maintained, although in the short-term (during construction), elements of the aquatic system could be disturbed. This level of disturbance is well within the range of natural variability for the watersheds of the Klamath-Siskiyou Province.

TABLE 2-35

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Upper Cow Creek Watershed

ACS Objective	Project Impacts
Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	Mercury from abandoned mercury mines in the South Fork Cow Creek subwatershed is a known issue. Broeker (2010b) and GeoEngineers (2013) assessed the potential risk of release of mercury from disturbance of affected sediments. A mercury concentration of 0.29 part per million (ppm), which is in exceedance of the ODEQ threshold of 0.1 ppm, was detected in soil and stream sediment samples at one site. Special measures including maintenance of 100% effective ground cover have been adopted as recommended by ODEQ. As a result, the presence of inorganic mercury is not anticipated to cause any health risk. Minor amounts of sediment would be mobilized during construction, particularly during the dry open-cut and dam and pump crossing of the East Fork Cow Creek and its perennial tributaries (GeoEngineers 2013). Water quality impacts from sediment are expected to be short-term and limited to the general area of construction (section 1.4.1.2). No long-term impacts on water quality are expected because of application of the ECRP, including maintenance of effective ground cover (section 1.4.1 and previous discussion) and BMPs during construction. A site-specific shade analysis conducted by Pacific Connector (NSR 2009, NSR 2015, Stantec 2019) showed minor temperature increases were possible at the project scale but no impacts would occur beyond the immediate area of construction; there were no temperature impacts at the stream-network scale. Water quality is expected to remain within the range that supports aquatic biota.
Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.	The Upper Cow Creek watershed sediment regime was historically characterized by pulse-type disturbances (Forest Service 1995, Everest and Reeves 2007). The East Fork Cow Creek, a drainage in the South Fork Cow Creek subwatershed, is characterized in the Cow Creek watershed analysis as being "in balance" for sediment transport and deposition. The project is not likely to alter these conditions. Eighty percent (3.73 of 5.26 miles) of the project in the Upper Cow Creek watershed is on ridge tops with little or no aquatic connectivity. Site-specific field reviews by geologists show the project is unlikely to cause landslides or activate currently stable earth-flow terrains because unstable areas have been avoided (GeoEngineers 2009, Hanek 2011, Stantec 2013). Surface erosion and sediment transport to streams would be minimized because the project would maintain 100% effective ground cover, effective sediment barriers, and other erosion control measures as needed (see the sediment discussion at the beginning of this section). Sediment generated during construction is expected to be minor and to be limited to the general area of construction by the use of dry dam-and-pump measures that isolate the crossing from flowing water during construction (section 1.3.1). The project is not expected to alter the balance of sediment transport and storage in East Fork Cow Creek. The project is not expected to alter either the pulse-type disturbance or surface erosion sediment regimes of the Upper Cow Creek watershed (section 1.4.1.2). A pulse of sediment could be observed following the first seasonal rain, but this is likely to dissipate within a few hundred feet and would be indistinguishable from background levels.
Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.	Instream flows would be interrupted for a short time during installation of dams during dam and pump crossings. The area of construction that is between upstream and downstream dams would be dewatered during the actual crossing construction. During construction, water would be pumped around the construction site to maintain downstream flows. It is possible that there would be local increases in runoff from canopy removal but at the watershed scale, flow regimes would not be altered by the project because of the small scale of the project relative to the watershed, the relatively high proportion (85%) of the watershed that is hydrologically recovered, and the lack of connectivity of most of the route to any stream network.

TABLE 2-35

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Upper Cow Creek Watershed

ACS Objective	Project Impacts
Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	The project right-of-way clips the Riparian Reserve of six forested wetlands and crosses one delineated wetland. Trench plugs would be installed on each side of these wetlands as needed to block subsurface flows and maintain water table elevations, as required by FERC's Wetland and Waterbody Construction and Mitigation Procedures. Regardless, project construction may have short-term impacts on water tables in these isolated forest wetlands. These site-specific impacts would be minor (i.e., limited to the general area of construction) and are not connected to larger wetland areas; they may also be regulated under section 404 of the Clean Water Act. By restricting crossings to the dry season (July 1 to Sept. 15), possible impacts on water tables of these wetland areas are expected to be minor and short-term.
Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation; nutrient filtering; and appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse, woody debris sufficient to sustain physical complexity and stability.	Project impacts on riparian vegetation in the Upper Cow Creek watershed would be minor. In the short term, all vegetation would be removed from the project right-of-way. About 3.73 acres of the Riparian Reserves to be cleared in the project right-of-way are LSOG (table 2-25). Existing herbaceous and brush cover would be maintained in Riparian Reserves to the extent practicable. Overall, project construction would affect ~0.13% of the Riparian Reserves in the watershed (table 2-25). Following construction, replanting with native species would facilitate reestablishment of vegetation communities. LWD and boulders from the corridor would be returned to disturbed riparian areas. These restoration efforts, along with the limited impacts to which they are directed, would maintain and restore biological and physical functions of the Riparian Reserves in the watershed.
Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	Project impacts on riparian vegetation in the Upper Cow Creek watershed would be minor (10 acres, or 0.13%, of the Riparian Reserves in the watershed) (table 2-25). Existing herbaceous and brush cover within the project clearing limits would be maintained to the extent practicable. Consistent with the requirements of the POD, LWD and boulders removed from the corridor during construction would be replaced to restore and stabilize channel crossings. Revegetation would be accomplished using native riparian species. The persistence of riparian-dependent Survey and Manage species would not be threatened by project construction and operation in the watershed. See appendix F.5.

Summary

The South Fork Cow Creek subwatershed has four perennial stream crossings within 1 mile. This is the highest number of perennial stream crossings in one subwatershed on NFS lands. Construction of the project in the Upper Cow Creek watershed has a high potential for impacts that could prevent attainment of ACS objectives, particularly as related to sediment, water temperature, and mobilization of naturally occurring mercury. The project has addressed these issues as follows:

- **Project Routing—**Approximately 80% of the route in the Upper Cow Creek watershed is on a ridge top with little or no connectivity to aquatic habitats or Riparian Reserves. Between MPs 109 and 110 in the South Fork Cow Creek subwatershed, the route has been selected and modified to avoid potentially unstable areas, reduce impacts on Riparian Reserves, and ensure that Forest Service and ODEQ water quality requirements are met. The Forest Service has participated extensively in routing of the project and concurs that the location is unlikely to trigger mass wasting or excessive surface erosion.

- **Implementation of Water Quality Best Management Practices—**A site-specific BMP implementation plan based on construction impact and site-response risk has been prepared that is expected to maintain water quality (GeoEngineers 2013c). Within Riparian Reserves for all hydrologic features crossed by the pipeline between MPs 109 and 110, the project would provide 100% post-construction ground cover on all disturbed areas. Wood fiber is the preferred material, supplemented as needed by other organic materials. In addition, the project would construct water bars at 50-foot intervals. Other erosion control measures would be used as needed to prevent surface erosion associated with stream crossings or to prevent sediment transport and deposition that may affect riparian systems.

- **Mitigation of Potential Impacts on Stream Temperature—**A temperature analysis on perennial stream crossings showed the project may have minor temperature impacts (~0.1°C) at the project scale (NSR 2009, NSR 2015, Stantec 2019). Although the analysis showed there would be no impact at the next downstream reach below the crossings because of ground water discharge, flow volumes, and existing shade, the project would transplant larger conifers to riparian areas and use logs and slash to provide shade at perennial crossings in the East Fork Cow Creek to mitigate for temperature impacts at the project scale. Temperatures are expected to remain below those specified by the State of Oregon for streams in the Umpqua Basin.
- **Mercury—**The Forest Service contracted with a geologist consultant to collect soil and stream sediment samples for analytical testing and reporting of mercury and other naturally occurring minerals along a 2,000-foot section of the proposed pipeline route between MP 109 and the East Fork Cow Creek (Broeker 2010b, GeoEngineers 2013e). Geochemical analysis of the soil and stream sediment samples showed very low to nominal concentrations of naturally occurring mercury mineralization. The mercury level at one of the stream sediment sites was 0.29 ppm, which was above the Level II screening level value of 0.1 ppm for invertebrates (ODEQ 1998, cited in GeoEngineers 2013d). In order to prevent this naturally occurring mercury from mobilizing during and after construction, additional erosion control measures and monitoring would be conducted at these sites. The proposed pipeline construction activities by Pacific Connector within the Upper Cow Creek watershed are not anticipated to disturb or expose soils and bedrock strata that contain more than low amounts of natural occurring mercury mineralization, and any sediment that is generated is not likely to reach the aquatic environment due to implementation of short-term and permanent mitigation measures outlined in Pacific Connector's ECRP and as listed in GeoEngineers 2013e.

There are approximately 7,849.12 acres of Riparian Reserves (NFS lands only) in the Upper Cow Creek watershed, of which approximately 3,313.66 acres are LSOG. Approximately 10 acres of Riparian Reserves, or 0.13% of the Riparian Reserves on NFS lands in the watershed, would be cleared (table 2-24). Of this amount, approximately 3 acres are LSOG (table 2-25), which is about 0.13% of the LSOG in Riparian Reserves on NFS lands in the Upper Cow Creek watershed. Early- and mid-seral forest vegetation constitutes the remaining 6 acres of the affected Riparian Reserve vegetation. LSOG and mid-seral vegetation (approximately 13.5 acres) cleared in the corridor would be a long-term, but minor in scale, change in vegetation that is within the range of natural variability for the Upper Cow Creek watershed considering its history of disturbance from stand-replacing fire and subsequent landslides. Federal lands are currently 35.20% LSOG and exceed minimum watershed thresholds for LSOG forest after consideration of PCGP impacts.

Four site-specific proposed amendments to the Umpqua National Forest LRMP are required to make provision for the Pacific Connector project. These proposed amendments are not expected to prevent attainment of the ACS in the Upper Cow Creek watershed (see table 2-32). These proposed amendments are as follows:

- Proposed amendment UNF-1 would allow removal of effective shade on perennial streams. This amendment would not prevent attainment of the ACS objectives because a site-specific temperature assessment (NSR 2009, NSR 2015, Stantec 2019) showed that any temperature increase resulting from removal of effective shade would be minor and would be limited to the point of maximum impact at the site of construction.
- Proposed amendment UNF-3 would allow the project to exceed limits on detrimental soil conditions within the construction corridor. This would not prevent attainment of ACS objectives because soil decompaction and remediation required in Riparian Reserves are expected to effectively moderate detrimental soil conditions. Implementation of measures in the ECRP is expected to effectively control surface erosion and restore native vegetation (see FEIS section 4.3.4).
- Proposed amendment UNF-4 would reallocate approximately 588 acres from the matrix land allocation to the LSR allocation. This would benefit aquatic habitats because this area would be managed for late-successional stand conditions that provide additional aquatic protections.
- Proposed amendment of the Umpqua National Forest LRMP to waive protection measures for Survey and Manage species would not prevent attainment of ACS objectives because the project does not threaten the persistence of any riparian-dependent species (see appendix F.5).

The routing of the project through NFS lands, coupled with the relatively small area of NFS land affected by project construction (73.74 acres, or 0.31%, of the NFS lands in the fifth-field watershed; table 2-23), makes it highly improbable that project impacts could affect watershed conditions. Although there are project-level impacts (e.g., short-term sediment and a long-term change in vegetative condition at stream crossings), these would be minor in scale and largely limited to the boundaries of the project area (see section 1.4.1.2).

No project-related impacts that would prevent attainment of ACS objectives have been identified (see section 2.4.6.8). All relevant project impacts are within the range of natural variability for watersheds in the Oregon Cascade Mountains and Klamath Mountains, although some of these processes have been altered from their natural condition (see p 2-70-84).

2.2.2 Rogue River Basin

2.2.2.1 Geographic Setting

The Rogue River Basin encompasses parts of four provinces: the High Cascades (14%), Western Cascades (16%), Klamath-Siskiyou (56%), and Coast Range (1%). The Rogue River’s largest tributaries, the Applegate and Illinois Rivers, are predominantly within the Klamath-Siskiyou

Province[26]. The four provinces reflect unique ecosystem and geologic conditions. Basin biota are tied to the geology that influences the province ecosystem. Geologic histories and conditions result in distinct ecosystem characteristics such as basin relief, drainage density, erosion processes, and soil/rock permeability. These are collectively also relevant to sediment yield and transport.

The headwaters of the Rogue River Basin (including most of the basin east of the confluences of the South Fork, Middle Fork, and mainstem Rogue River) are within the High Cascades Province. The High Cascades Province is underlain by highly permeable Pliocene and Quaternary lava flows that have low rates of surface water runoff and sediment transport. The parts of the Rogue River Basin within this province include the western slopes of Crater Lake, which is the remnant of a large Quaternary-age stratovolcano that erupted cataclysmically about 7,700 years ago and blanketed parts of the Rogue River's headwaters with thick tephra and pyroclastic flow deposits (USGS 2012). The Dead Indian Plateau in the eastern portion of the Little Butte Creek fifth-field watershed is typical of this landscape. In the central to eastern part of this province are the High Cascades, which are younger volcanic composite (stratovolcano) volcanoes and associated cinder cones overlying the older Western Cascades, which are exposed in the western part of the province. The older, more heavily eroded Western Cascades are now thought to be part of a mountain range, with the southern portion being the Sierra Nevada. Under this hypothesis, the cessation of volcanism in the Western Cascades and Sierra Nevada occurred with the initiation of the San Andreas Fault, the creation of the Mendocino Triple Junction point, and the consumption of the Farrallon Oceanic Plate. Volcanism in the modern High Cascades is from the subduction of the Pacific Oceanic Plate.

In the western part of the Rogue River watershed is a 20-kilometer- (12.5-mile-) wide band running north-south between the upstream confluence of the mainstem and the South Fork Rogue River and the downstream confluence of the mainstem and Trail Creek. This part of the province is underlain by Tertiary volcanic and volcanoclastic rocks that are typically weathered and highly dissected and, thus, are susceptible to high rates of runoff and mass wasting processes. The remainders of the Trail Creek and the western portion of Little Butte Creek fifth-field watersheds lie within the Klamath-Siskiyou Province.

2.2.2.2 Climate and Hydrology

Within the Rogue River Basin, only the Upper Rogue River Subbasin is crossed by the project. Streamflow in the Upper Rogue River Subbasin is driven by seasonal precipitation that typically falls in winter as snow in the upper basin near Crater Lake and as rainfall and occasional snow below 4,000 feet. Peak flows on the mainstem Rogue River typically derive from winter frontal systems, with the largest flows resulting from regional rain-on-snow events. From July to October, base flows are sustained by groundwater contributions from the Upper Rogue River Subbasin and occasional precipitation events. Pumice soils from the composite volcanoes and especially the cinder cones of the High Cascades Province tend to have high infiltration rates and are easily eroded when saturated. Low-gradient pumice plateaus tend to have a large storage capacity.

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[26] Provinces discussed in this document are based on both ecological and geological conditions and therefore do not match those recognized by the Oregon Department of Geology and Mineral Industries and the Oregon State Board of Professional Geologists and Geophysicists. The Klamath-Siskiyou Province is known by professional geologists as the Klamath Mountains Province and the Western Cascades and the High Cascades are two mountain ranges within the Cascades Mountains Province. See https://www.oregongeology.org/learnmore/geologicsightseeing.htm

Older, more-developed soils in the Cascades Province have lower infiltration rates but tend to be thin, with little water-holding capacity. This is also true of soils where the basin is in the Klamath-Siskiyou Province. As a result, streams tend to be "flashy" and respond rapidly to storm events.

TMDL thresholds and a Water Quality Restoration Plan (WQRP) were established for temperature and for other pollutants for the Rogue River Basin in 2008 (https://www.oregon.gov/deq/FilterDocs/rogueChapter1andExecutiveSummary.pdf).

2.2.2.3 Trail Creek Fifth-Field Watershed, HUC 1710030706

Overview

The Trail Creek fifth-field watershed is located in southwestern Oregon between Medford and Crater Lake National Park. It is one of eight fifth-field watersheds in the 2,618-square-mile Upper Rogue River Subbasin. The watershed lies north and west of the Rogue River and extends upslope to the divide with the South Umpqua River Basin to the north. Below the confluence of Trail Creek with the Rogue River (at the town of Trail), the Rogue River turns south and traverses the Shady Cove–Rogue River fifth-field watershed. Upon leaving the Shady Cove–Rogue River watershed, the Rogue River turns westward and flows through the Rogue River–Siskiyou National Forest and the Klamath Mountains to the Pacific Ocean at Gold Beach, Oregon, about 32 miles from the border with California. The entire Rogue River drainage basin is about 132 miles wide (east to west). See figure 1-1 for the regional setting of this watershed and its relationship to the other fifth-field watersheds traversed by the project right-of-way.

Most of the watershed lies in Jackson County, although the northernmost portion lies in Douglas County. The towns of Trail and Shady Cove (population approximately 3,276 [U.S. Census Bureau 2016]) are within or adjacent to the watershed. Oregon State Highway 227 passes through the center of the Trail Creek Basin. Approximately 12.3% of the land in the watershed is in the Umpqua National Forest, and 41.6% is managed by the BLM Medford District. The rest (46.1%) is in non-federal ownership. Logging and agriculture dominate human land use in the watershed.

The Trail Creek watershed lies predominantly within the Western Cascades Province, although some lands in the southern portion of the watershed are more representative of the Klamath-Siskiyou Province. The entire Trail Creek watershed is formed from Tertiary Period (1.6 to 66 million years before present) volcanoclastic rocks deposited as lahars (volcanic mudflows) and pyroclastic rocks (supraheated ash flows) on a nearly flat to gently sloping landscape. Weathering processes in the northern part of the watershed and higher elevations have resulted in rugged topography, with irregular ridges and deep narrow valleys. Gentle to moderate slopes predominate in the southern and lower elevations of the watershed, with slope steepness generally increasing with increasing elevation to the north.

Elevations on the Trail Creek watershed range from a low of 1,436 feet amsl at the town of Trail, where Trail Creek empties into the Rogue River, to 4,698 feet amsl at Threehorn Mountain, located on the northern margin of the watershed along the divide that separates the Rogue and Umpqua river basins. Much of the northern divide and adjoining western and eastern margins of the watershed exceed 4,000 feet amsl in elevation.

The 55.2-square-mile (35,338-acre) Trail Creek watershed includes three subwatersheds (figure 2-9, table 2-36). The West Fork and Upper Trail Creek subwatersheds occupy most of the watershed, while the Lower Trail Creek subwatershed occupies the southernmost portion of the watershed. The watershed is bounded on the north by the Elk Creek–South Umpqua River and Upper Cow Creek fifth-field watersheds of the South Umpqua Subbasin, by the Elk Creek–Rogue River fifth-field watershed to the east, the Shady Cove–Rogue River fifth-field watershed to the southeast and south, and the Evans Creek fifth-field watershed of the Middle Rogue River Subbasin to the west. Headwater areas are dominated by dendritic drainage patterns with first- and second-order streams composing the majority of the stream miles.

The watershed experiences a Mediterranean-type climate characterized by mild [word missing such as "wet"?] winters; hot, dry summers; and a long frost-free period. Mean annual precipitation is about 40 inches and is lowest near the confluence of Trail Creek and the Rogue River and generally increases to the north and with increasing elevation. Approximately 70% of the annual precipitation in the watershed falls in the five months of November through March. Lightning storms are common and contribute to extreme fire dangers.

Streamflow patterns reflect the distribution of precipitation, with lows in the summer and high flows beginning in late fall and peaking in winter. Most of the watershed is in the TSZ, where total to partial snow melt during warm mid-winter rain-on-snow events are associated with nearly all major peak flows.

Figure 2-9 shows the contiguous nature of NFS lands (found largely in the northwest corner of the watershed) and the LRMP allocation status of these lands. NFS lands are found only in the Upper Trail Creek and West Fork Trail Creek subwatersheds, where they are similarly represented (2,225 acres and 2,127 acres, respectively). Together, they constitute 12.3% of the land in the watershed. Approximately 46.1% of the land in the watershed is privately owned (table 2-36).

Location and Routing

At MP 111.10, the project right-of-way crosses over the divide separating the Umpqua River drainage from the Rogue River drainage and moves into the Trail Creek fifth-field watershed (figure 2-9). Once in the Trail Creek watershed, the corridor runs in a south-southeast direction along the ridge tops that form the divide between the West Fork Trail Creek and Upper Trail Creek subwatersheds. Along this segment, the corridor runs alternately on both sides of the divide. At MP 118.36, the corridor leaves the subwatershed divide and runs south across the southeast corner of the West Fork Trail Creek subwatershed, over the divide separating the West Fork Trail Creek and Lower Trail Creek subwatersheds, and across the Lower Trail Creek subwatershed (mainly on private land). The corridor exits the Trail Creek watershed at MP 121.77, passing into the Shady Cove–Rogue River fifth-field watershed to the south.

Within the Trail Creek watershed, the project traverses a total of 10.68 miles, with 2.39 miles in the Lower Trail Creek subwatershed, 4.67 miles in Upper Trail Creek subwatershed, and 3.62 miles in West Fork Trail Creek subwatershed. On NFS lands, the project right-of-way travels 2.09 miles, which includes 1.41 miles in Upper Trail Creek subwatershed and 0.68 mile in West Fork Trail Creek subwatershed (table 2-37). Most of the traversed land is in the TSZ, where land clearing may contribute to elevated peak flow conditions during warm rain-on-snow events.

The project is in the Umpqua National Forest from MP 111.10, where it enters the watershed, to MP 113.2. This segment of the project lies on a ridge top between the West Fork Trail Creek and the Upper Trail Creek subwatersheds. The project right-of-way (cleared and modified project areas) on the Umpqua National Forest occupies approximately 50.27 acres, of which approximately 20.48 acres are in the Upper Trail Creek subwatershed and 29.79 acres are in the West Fork Trail Creek subwatershed (table 2-37). From MP 113.2 to 121.77, the project crosses interspersed private lands forming a checkerboard with BLM lands. There are no designated LSRs[27] on NFS lands in the Trail Creek watershed. Approximately 415.86 acres of unmapped LSRs are associated with KOACs[28]; however, none of these LSRs are affected by the project.

Project effects in the Trail Creek watershed on all ownerships total 220.90 acres (table 2-37). These affected acreages include 50.27 acres of NFS land (41.28 acres cleared and 8.99 acres modified and constituting 1.15% of the NFS lands in the watershed). All NFS lands within the project corridor are in the matrix[29] or Riparian Reserve land allocations (table 2-38). There are several stream crossings on BLM or private lands, but no streams or waterbodies are crossed on NFS lands. Approximately 50.27 acres of matrix land would be affected in the Trail Creek watershed, including 41.28 acres cleared and 8.99 acres modified. No Riparian Reserves are affected within the Trail Creek watershed.

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[27] Late Successional Reserves (LSR) values only apply to NFS lands.

[28] Known Owl Activity Centers (KOACs) only apply to NFS lands.

[29] Matrix is an NFS land allocation

Figure 2-9 PCGP Routing and Subwatershed Boundaries, Trail Creek Fifth-Field Watershed

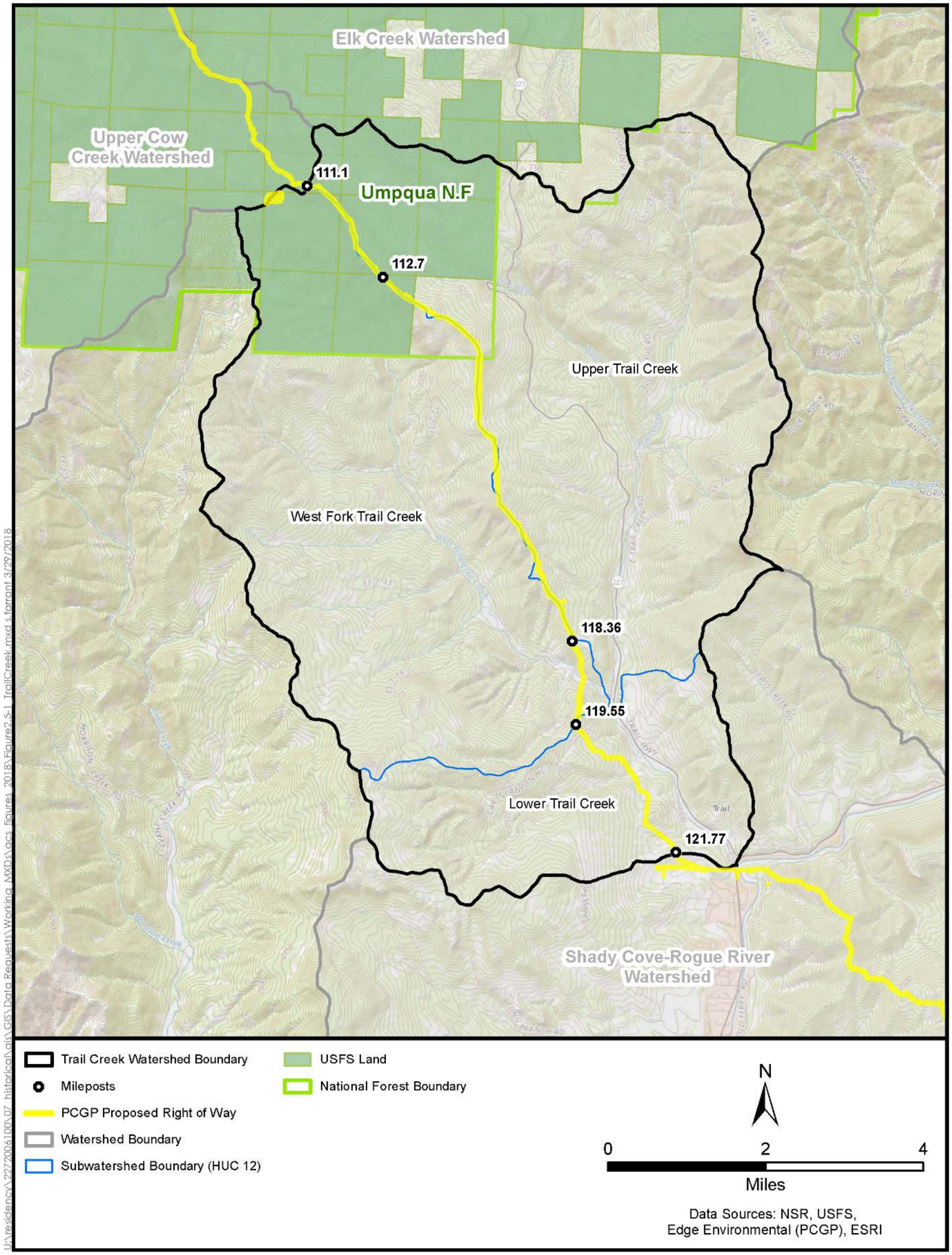

TABLE 2-36

Land Ownership and Forest Service Land Allocations (acres) in Trail Creek Fifth-Field Watershed (HUC 1710030706)

	Land Ownership (acres)					Forest Service Land Allocation (acres)		
Sixth-Field Watershed	**Sixth-Field Watershed (acres) a/**	**NFS Land**	**BLM**	**Total NFS and BLM**	**Other**	**LSR**	**Riparian Reserves b/**	**Matrix**
Lower Trail Creek	5,534.07	0.00	2,374.75	2,374.75	3,159.32	0.00	0.00	0.00
Upper Trail Creek	15,493.67	2,225.61	7,551.61	9,777.22	5,716.45	0.00	633.83	2,120.14
West Fork Trail Creek	14,309.95	2,127.64	4,774.99	6,902.63	7,407.32	0.00	733.19	1,807.01
Watershed Total	**35,337.69**	**4,353.25**	**14,701.35**	**19,054.60**	**16,283.09**	**0.00**	**1,367.02**	**3,927.15**

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a/ All data derived from Stantec-based GIS layers.
b/ May occur within other NFS land allocations.

TABLE 2-37

Project Corridor (miles) and Project Area (acres) in Trail Creek Fifth-Field Watershed (HUC 1710030706) by Land Ownership

	Land Ownership							
	NFS Lands				Entire Sixth-Field Watershed			
		Project Area (acres)				Project Area (acres) b/		
Sixth-Field Watershed a/	**Corridor Length (miles)**	**Cleared**	**Modified**	**% of NFS Land Impacted**	**Corridor Length (miles)**	**Cleared**	**Modified**	**% of Sixth-Field Watershed Impacted**
Lower Trail Creek	0.00	0.00	0.00	0.00	2.39	31.24	6.91	0.11
Upper Trail Creek	1.41	16.87	3.61	0.47	4.67	58.49	21.22	0.23
West Fork Trail Creek	0.68	24.41	5.38	0.68	3.62	74.65	28.39	0.29
Watershed Total	**2.09**	**41.28**	**8.99**	**1.15**	**10.68**	**164.38**	**56.52**	**0.63**

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a/ All data derived from Stantec-based GIS layers.
b/ Includes NFS, BLM, and other ownerships.

TABLE 2-38

Project Area (acres) on NFS Lands in the Trail Creek Fifth-Field Watershed (HUC 1710030706) by Land Allocation

	Designated LSR b/				Matrix				Riparian Reserves b/			
	Project Area (acres)		% of Total LSR on NFS Land		Project Area (acres)		% of Total Matrix on NFS Land		Project Area (acres)		% of Total Riparian Reserves on NFS lands c/	
Sixth-Field Watershed a/	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**	**Cleared**	**Modified**
Lower Trail Creek	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Upper Trail Creek	0.00	0.00	0.00	0.00	16.87	3.61	0.80	0.17	0.00	0.00	0.00	0.00
West Fork Trail Creek	0.00	0.00	0.00	0.00	24.41	5.38	1.35	0.30	0.00	0.00	0.00	0.00
Watershed Total	0.00	0.00	0.00	0.00	**41.28**	**8.99**	**1.05**	**0.23**	**0.00**	**0.00**	**0.00**	**0.00**

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a/ All data derived from Stantec-based GIS layers.
b/ Includes mapped and unmapped LSR on NFS lands.
c/ Riparian Reserve acres overlap with LSR and matrix land allocations.

Existing Conditions

Original Watershed Assessment Findings

The BLM completed the watershed assessment for the Trail Creek watershed in 1999 (BLM 1999b). Past activities on NFS lands are listed in table 2.39. Watershed conditions are as follows:

- Road density in the watershed (all ownerships) is about 3.4 miles of road per square mile. Road density for NFS lands only is not specified.
- Soils in the Trail Creek watershed are subject to erosion where exposed and compacted or puddled with associated destruction of internal macro-porosity, leading to surface runoff. Delivery of sediment to streams is a concern, particularly on steep slopes. Due to their high clay content, road surfaces have poor bearing strength when wet, and unsurfaced roads are subject to rutting, concentration of surface flows, and delivery of sediment to streams. Debris flows and debris torrents, however, were not observed on aerial photos dating from 1966, suggesting that Trail Creek and its tributaries are not as susceptible to this type of disturbance as other channels in the Cascades.
- Deep-seated landslides and earthflows are common in the Trail Creek watershed. Earthflows have plastic silt and clay soils formed from volcanic parent materials that underlie the entire watershed. Deep-seated landslide movements are associated with climatic shifts and fluvial undercutting of the landslide toes. Prior to European settlement, these deep-seated landslides usually moved during wet periods of the Holocene and Anthropocene Epochs and remained stable during drier periods.
- A defining characteristic of the Trail Creek watershed is that response reaches contain very little wood and coarse sediment, which are critical for formation of quality fisheries rearing and spawning habitat.
- All subwatersheds in the Trail Creek watershed, as well as the watershed as a whole, have predicted increases in peak flows of less than 10% for both the average and unusual storm simulations. Therefore, all subwatersheds have been assigned a low sensitivity to peak flow increases.
- Roads are the single greatest source of management-related delivered sediment in the watershed.

TABLE 2-39

Past Activities on NFS Lands in Trail Creek Watershed since Publication of the Trail Creek Watershed Assessment, June 1999

Name	Activity Type	Dates	Total Acres/Miles	Location
Cattle Grazing	Cattle grazing	1999–2012	4,230 ac	Upper and West Fk. Trail (6th)
Reforestation	Tree planting	1998–2000	54 ac	Upper and West Fk. Trail (6th)
Road Maintenance	Brushing, grading, resurfacing	2010–2012	3 mi	Upper and West Fk. Trail (6th)

Current Watershed Conditions

Overall watershed conditions remain similar to those described in the watershed assessment. Watershed conditions have improved somewhat on NFS lands since the watershed assessment was written. Collectively, watershed restoration efforts have improved watershed condition in the subwatersheds and stream reaches where projects occurred; however, ongoing timber management, grazing, and development continue to affect watershed conditions on private lands, which, in turn, affect overall watershed conditions. Small-scale disturbances have had local effects. No large-scale disturbance events have occurred that would affect overall watershed conditions on NFS lands. The Forest Service Watershed Condition Class rating for the Trail Creek watershed was "functioning at risk," with "at risk" scores for fire, roads, and water quality (Attachments: section 3.3.1). NWFP aquatic monitoring showed a slightly declining trend in overall watershed condition in the Upper Trail Creek subwatershed, with negative trends for vegetation. The West Fork and Lower Trail Creek subwatersheds showed slightly improving watershed conditions and positive trends in vegetation (Attachments: section 3.3.2).

Natural Disturbance Processes

Surface erosion of well-forested areas rarely occurred in the watershed, with the possible exception of erosion that occurred immediately following severe wildfire. Thin and stony soils, which are often sparsely vegetated with hardwoods and grasses, may also have been subject to surface erosion. However, most natural erosion within the watershed likely occurred as mass wasting, soil creep, and related streambank and channel erosion, most of which is likely to have occurred during major flood events. Channel-scouring debris flows and debris torrents (i.e., saturated debris flows) have occurred in steep first-, second-, and some third-order channels, depositing coarse sediment and LWD into transport/response transitional areas. However, no debris torrent tracks were observed to have occurred in the Trail Creek watershed in the photo record made available for the watershed assessment (1966, 1969, 1975, 1985, and 1996). This suggests that debris torrent events may not have been as frequent as is common for steeper and more failure-prone areas of the Cascades Range, Coast Range, and Klamath Mountains (BLM 1999: 3-10).

Project Effects and Range of Natural Variability

Watershed assessment/analysis is the assessment and documentation of the historic range of variability and provides recommendations for management activities that contribute to restoring watershed health and achieving the objectives of the ACS (table 2-40). The Trail Creek watershed assessment described reference and current conditions and general ecological trends, but it did not establish metrics that reflect the natural variability at the watershed scale. Management recommendations to improve watershed health were provided that are responsive to the conditions and trends in the watershed. Those that are pertinent to the project from the Trail Creek watershed assessment are summarized below. The congruence of the project with each recommendation is noted.

TABLE 2-40

Project Effects and Relevant Ecological Processes Described in the Trail Creek Fifth-Field Watershed Assessment

Ecological Processes Relevant to the Project	Historic Range of Variability	Pacific Connector Effects
Erosional Processes	Mass wasting was generally associated with major storms and floods. Channel-scouring debris flows and debris torrents undoubtedly occurred in steep first-, second-, and some third-order channels, depositing coarse sediment and LWD into transport/response transitional areas. However, no debris torrents were observed to have occurred in the Trail Creek watershed in the photo record made available for this analysis (from 1966, 1969, 1975, 1985, and 1996). This suggests that debris torrents may never have been as frequent as is common for steeper and more landslide failure-prone areas of the Cascades Range, Coast Range, and Klamath Mountains. Prior to disturbance of soils by road construction, logging, and forest conversion to non-forest land uses, the rate of surface erosion of well-vegetated areas was low in the watershed, with the exception of erosion that occurred immediately following severe wildfire or other forms of vegetation mortality. Thin and stony soils, which are often sparsely vegetated with hardwoods and grasses, have been subject to surface erosion over geologically recent time. Most natural erosional processes within the watershed are mass wasting, soil creep, and related streambank and channel erosion, most of which is likely to have occurred during major flood events.	The PCGP has been routed to avoid unstable or potentially unstable areas. There are approximately 2.09 miles of corridor on NFS lands within the watershed. Nearly the entire length of the project in the Trail Creek watershed is on ridge tops with no hydrologic connection. There are no river or stream crossings on NFS lands in the watershed. No Riparian Reserves would be affected in the Trail Creek watershed.
Ecological Succession/ Vegetative Condition	Fire was the major disturbance factor affecting vegetation patterns in the watershed. Wildfires in the mixed evergreen forests of southern Oregon and northern California occurred at frequencies of 5 to 25 years. Naturally occurring fires were ignited primarily by lightning sources, which can strike more or less randomly, regardless of elevation. Hot, dry climatic conditions are common in the region, further increasing the chances of ignition and spread. During pre-settlement, Native Americans also used fire on a much more frequent basis to maintain grasslands and oak woodlands in the major river valleys. These fires were generally of relatively low to moderate intensity and limited extent, burning in mosaic patterns. Because of this fire cycle, fuel loads were maintained at relatively low levels. Understory and ground fuels were typically consumed, reducing the probability of crown fires. Because of these frequent, minor reductions in fuel profiles, the potential for large-scale catastrophic events was greatly reduced. Overall, this process maintained a more or less stable ecosystem dominated by fire-tolerant species such as Douglas-fir, ponderosa pine, and Oregon white oak. Fire suppression and timber management have reduced and fragmented late successional stands, reducing patch size, shifting species dominance to white fir, and increasing early- and mid-seral proportions of the drainage. Late-successional or old-growth acres in both upland and riparian areas are below historic averages. Vegetative condition throughout the Trail Creek watershed has been significantly altered by timber management activities.	No Riparian Reserves would be affected by the project. Approximately 1,968 acres of NFS lands in the watershed are characterized as LSOG, and approximately 15 acres of these LSOG acres would be cleared by the project. Loss of LSOG vegetation in the project right-of-way is a long-term impact, but it is minor in scale and well within the historic range of vegetative disturbance in the Trail Creek watershed. Standards and Guidelines for the NWFP (C-44) require retention of all LSOG where less than 15% of federal lands in a watershed are in LSOG condition. Federal lands in the Trail Creek watershed are currently 28% LSOG, exceeding this threshold.

TABLE 2-40

Project Effects and Relevant Ecological Processes Described in the Trail Creek Fifth-Field Watershed Assessment

Ecological Processes Relevant to the Project	Historic Range of Variability	Pacific Connector Effects
Flow Regime processes	Most of the watershed is subject to periodic snowfall and subsequent total to partial snow melt during warm mid-winter rain-on-snow events, which are associated with nearly all major peak flows. The reference condition for this watershed is fully forested, interrupted by widespread severe wildfire at intervals of several decades to centuries. Wildfires may have caused partial water repellency of soils (hydrophobicity) in severely burned areas in the watershed that may cause elevated peak flows for 1 to 5 years following fire.	In the complete project right-of-way, the greatest disturbance within the TSZ on a percentage basis would occur within the Trail Creek watershed. The project would disturb a total of 127.64 acres within the TSZ in this 28,867-acre watershed, which represents 0.44% of the total watershed area (GeoEngineers 2012, Resource Report 2, p 46). Whether the project disturbance in the TSZ would result in an increase in peak flows depends on watershed conditions. The Trail Creek watershed assessment determined that all subwatersheds in the Trail Creek watershed, as well as the watershed as a whole, have predicted increases in peak flows of less than 10% for both the average and unusual storm simulations. Therefore, all subwatersheds have been assigned a low sensitivity to peak flow increases. The watershed assessment indicates that current rain-on-snow flood magnitudes are not substantially different than the reference condition (BLM 1999b: 4-8). Given the small surface area affected by the corridor, it is highly unlikely that the project would increase peak flows in the watershed (see also FEIS chapter 4.3).
Stream Temperature	There are no reports or data that define the reference condition for streams within the Trail Creek watershed (BLM 1999, p. 3-31). The watershed assessment indicates that summer maximum water temperatures naturally exceed the Oregon 64ºF standard in many streams. Furthermore, the regression model predicts that the 64ºF standard cannot be achieved at elevations below 2,000 feet even with 100% shade, a level of shading that is seldom, if ever, achievable at the lower elevations in the Trail Creek watershed. Conversely, the model indicates that the 64°F standard is likely to be met at elevations above 3,400 feet, regardless of stream shade levels. In the Trail Creek watershed, all fish-bearing streams lie below 3,400 feet and most are below 2,600 feet (BLM 1999, p. 3-64). Notwithstanding the ability of the watershed to reach desired conditions, it is likely that timber harvest and road construction have reduced shade in the upper portions of the watershed. The 7-day maximum temperature (ºF) exceeded the Oregon standard of 64ºF at five monitoring stations located within the Trail Creek watershed. Seven-day maximum daily temperatures near the mouth of the West Fork and Trail Creek reach 80.3 and 83.5ºF, respectively.	The project does not cross any perennial streams on NFS lands in the Trail Creek watershed; therefore, it is unlikely that stream temperatures would be impacted by the project on lands where the ACS applies.
Aquatic Habitat and Stream Channel Complexity	There are no reports or data that define the reference condition for streams within the Trail Creek watershed. Conditions representative of western Oregon Cascades streams are presumed to have existed in the Trail Creek watershed. Many streams within forested West Coast watersheds had a higher density of LWD than is found under current conditions (BLM 1999, 3-31). Typically, these stream channels had 40–60 pieces of LWD/mile with >30% pool habitat by area. Prior to human impact, beaver dams and	No wetlands or streams are affected on NFS lands in the Trail Creek watershed. Therefore, no long-term effects to aquatic habitat are expected.

TABLE 2-40

Project Effects and Relevant Ecological Processes Described in the Trail Creek Fifth-Field Watershed Assessment

Ecological Processes Relevant to the Project	Historic Range of Variability	Pacific Connector Effects
	high densities of LWD in log jams created complex channels and maintained pools in streams of the watershed. Water was stored in the channel and as shallow perched aquifers or shallow unconfined ground water aquifers in the streambanks and floodplains. This water was slowly released during the summer, thereby sustaining flows. The combination of LWD and streambank vegetation was indicative of relatively stable streambanks and channels that were relatively resilient during floods. Well-developed mid-channel and channel-margin gravel bars may have been common. The large mainstem channels of Trail Creek (Lower Trail, East Fork, and West Fork) appear to have been scoured by large flood events, such as occurred in 1964, and gravel and cobble substrate are uncommon. Streambanks are typically stable along Trail Creek and the lower reaches of the main tributaries due to the dominance of rock or well-vegetated streambanks (BLM 1999: 3-33).	

Recommendation—Vegetation. Decrease ladder fuels in forest stands by cutting dense patches of suppressed tree regeneration and shrub species.

Recommendation—Hydrologic Change. Fire-hazard reduction should directly reduce risk to areas with high percentages of drainage area in the rain-on-snow zone (elevation 3,600 to 4,800 feet). These are areas where hydrologic change is most responsive to changes in canopy cover that would result from catastrophic wildfire.

- **Project:** The applicant-filed mitigation plan includes 175 acres of shaded fuel breaks on NFS lands in the Trail Creek watershed that are responsive to these recommendations.

Recommendation—Vegetation. Consider the use of sterile and/or competitive grasses on disturbed sites to prevent encroachment of noxious weeds. Use of native grass seeds should also be considered in instances where noxious weeds have not yet become established. Active and non-active roads should be considered in this recommendation, as should early seral-stage vegetation conditions, which are both extensive in the watershed. Prevention activities should be applied for all activities, including minimization of ground disturbance, where possible; use of native, non-invasive, or non-persistent species in reclamation; and equipment decontamination. This recommendation should be implemented through standard operating procedures.

Consider aggressive post-harvest prescriptions to control noxious weed infestation in harvested lands and adjoining lands and roads. Any of the prescriptions outlined above would be considered under such a strategy.

- **Project:** The ECRP exhibit to the POD, which was filed as part of the FERC application, is consistent with these recommendations.

Recommendation—Hydrologic Processes. If future management alternatives or projects are extensive and therefore have a potential for increasing peak flows above acceptable limits, consider additional analysis consistent with the procedures used in the watershed assessment to define acceptable subwatershed canopy removal and stand treatment limits.

- **Project:** FERC conducted a site-specific evaluation of peak flow potential in Trail Creek watershed. FERC's evaluation concluded that, although increased snow accumulation may occur (which can lead to peak flow increases in rain-on-snow events), the probability of any measurable increase in peak flows is unlikely because of the relatively small areas affected in any single watershed and the design measures incorporated by Pacific Connector to minimize effects on forest hydrology. These findings are consistent with the Trail Creek watershed assessment conclusions that amount, timing, and delivery of water, sediment, and wood from the forested parts of this watershed are not changed appreciably from the reference conditions. Changes in sensitivity to peak flow increases would remain inconsequential unless large areas of forest are harvested or burned in the near future. Results of simulation of watershed conditions during mid-winter rain-on-snow runoff events presented in the Trail Creek watershed assessment suggest that the magnitude of current rain-on-snow flood events are not substantially different from the reference condition.

Recommendation—Hydrologic Processes. Allow for 100-year runoff events, including associated bed-load scouring and deposition, when installing new stream crossing structures and for existing stream-crossing structures that pose substantial risk to Riparian Reserves.

Recommendation—Erosional Processes. Maintain and enhance the sediment erosion, transportation, and deposition under which the aquatic ecosystem evolved and improve, maintain, or restore federal road systems with an emphasis on adequate drainage and surfacing. Reconstruct, stabilize, reroute, close, obliterate, or decommission roads and landings that pose substantial risk to Riparian Reserves.

Recommendation—Erosional Processes. Reconstruct, stabilize, reroute, close, obliterate, or decommission roads and landings that pose substantial risk to Riparian Reserves.

Project: Roads used by the project for access and construction would be maintained or improved as needed to minimize erosion. In addition, the applicant-filed mitigation plan provides for storm-proofing 2.2 miles and decommissioning 0.3 mile of roads in the Trail Creek watershed on NFS lands. Table 2-39 compares the historic range of variability and the project effects for selected ecological processes relevant to the project.

Compliance with Umpqua National Forest Land and Resource Management Plan

Table 2-41 provides Umpqua National Forest LRMP Standards and Guidelines relevant to the ACS and project compliance with this management direction on NFS land in the Trail Creek watershed.

TABLE 2-41

Compliance with Umpqua National Forest LRMP Standards and Guidelines in the Trail Creek Watershed

LRMP Standard and Guideline	**Project Compliance**
LH-4: Issuing leases, permits, right-of-way and easements.	Terms and conditions to ensure compliance with ACS objectives have been incorporated into the POD prepared by the applicant in conjunction with the BLM, Forest Service, and Reclamation and submitted as part of the Right-of-Way Grant application. The POD includes 28 exhibits, including the Wetland and Waterbody Crossing Plan, the Erosion Control and Revegetation Plan, the Hydrostatic Test Plan, the right-of-way Clearing Plan, and the Traffic Management Plan, etc.
RA-4: Locating water withdrawal sites.	Pacific Connector has developed a Hydrostatic Test Plan (see the POD) that would minimize any potential short-term effects on stream flows from water discharge events from the project's hydrostatic testing operations. No potential hydrostatic test water sources occur within the Trail Creek watershed; therefore, the biological, physical, and chemical integrity of these systems would remain unaffected by hydrostatic withdrawal activities.
RF-2: Road Construction Standards and Guidelines.	The existing transportation system in the Trail Creek watershed would be adequate for construction of the project. No new temporary or permanent access roads are planned in the Trail Creek watershed.
RF-4: New culverts, bridges and other stream crossings.	No new road crossings of streams are proposed in the Trail Creek watershed. Crossings would be maintained to prevent diversions. Specific specifications in the TMP (see section 2.2.3 and Exhibit F, section F.9.e) require culvert and bridge replacements to meet agency standards and agency approval of plans.
RF-5: Minimizing sediment delivery from roads.	Road maintenance specifications in the TMP require implementation of T-831, T-842, T-811, and T-834, which are maintenance specifications designed to minimize sediment delivery to aquatic habitats; these specifications would be implemented during project construction. Several road improvement projects and road decommissionings are proposed in the Trail Creek watershed. These are expected to reduce sediment delivery from roads, in some places significantly.
RF-6: Maintaining fish passage.	Fish passage would be maintained at all road crossings where project-related road repairs are implemented.
RF-7: Transportation Management Plan development.	The TMP submitted by the applicant and accepted by the Forest Service meets all of the requirements of RF-7 in the Trail Creek watershed.
WR-3: Proper use of planned mitigation and restoration.	Application of BMPs and aggressive erosion control measures, restricted construction windows, and numerous other impact minimization measures have been incorporated into several exhibits to the POD to prevent habitat degradation. These measures are not being used as a substitute for otherwise preventable habitat degradation or as surrogates for habitat protection.
Umpqua National Forest Forest-Wide Soils Standard and Guideline #1 (LRMP IV-67)	The combined total amount of unacceptable soil condition (detrimental compaction, displacement, puddling, or severely burned) in an activity area (e.g., cutting unit, range allotment, site preparation area) should not exceed 20%. All roads and landings, unless rehabilitated to natural conditions, are considered to be in detrimental condition and are included as part of this 20%. Pacific Connector cannot meet this standard. An LRMP amendment (UNF-3) is proposed to waive application of this standard.
Management direction for Survey and Manage Species in the NWFP ROD was replaced by the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines as Modified by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.)	The project affects Survey and Manage species within the Trail Creek watershed. This is not consistent with Management Recommendations in the 2001 Survey and Manage ROD; however, the project does not threaten the persistence of any Survey and Manage species (see appendix F.5). Waiving application of Management Recommendations for Survey and Manage species in the watershed would not prevent attainment of any ACS objective.

TABLE 2-41

Compliance with Umpqua National Forest LRMP Standards and Guidelines in the Trail Creek Watershed

LRMP Standard and Guideline	Project Compliance
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth-field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15% or less late-successional forest. (The assessment of 15% will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands. Protection of these stands could be modified in the future, when other portions of the watershed have recovered to the point where they could replace the ecological roles of these stands.	Federal lands in the Trail Creek watershed are currently 28% LSOG and exceed the 15% threshold.

Relationship of Proposed Umpqua National Forest LRMP Amendments to the ACS

UNF-3. Allows the project to exceed restrictions on detrimental soil conditions in the project right-of-way.

Approximately 41.28 acres of the Umpqua National Forest would be cleared by the project in the Trail Creek watershed (table 2-37). The only LRMP amendment with an ACS nexus in this watershed is UNF-3, which allows the project to exceed restrictions on detrimental soil conditions resulting from displacement and compaction in the project right-of-way.

Umpqua National Forest LRMP IV-67-1, Forest-Wide Soils Standard and Guideline, states:

> The combined total amount of unacceptable soil condition (detrimental compaction, displacement, puddling or severely burned) in an activity area (e g., cutting unit, range allotment, site preparation area) should not exceed 20%. All roads and landings, unless rehabilitated to natural conditions, are considered to be in detrimental condition and are included as part of this 20%.

Degraded soil conditions may occur in cleared project areas. On NFS lands in the Trail Creek watershed, approximately 82% (41 acres) of the project right-of-way would be cleared. Degraded soil conditions may result from displacement and compaction following completion of project construction and rehabilitation. Compaction can largely be addressed by subsoil ripping, but displacement would be unavoidable because of the nature of the project. Existing LRMP Standards and Guidelines allow up to 20% of the project right-of-way, or 10 acres, to result in a degraded soil condition upon completion of a project. Thus, the proposed amendment allows an estimated additional 31 acres or 0.71% of the NFS lands in the Trail Creek watershed to be in a degraded soil condition on completion of the project.

Severe disturbances such as soil mixing or displacement would reduce long-term site productivity by displacing the duff layer and soil surface (A horizon), thus reducing the soil's ability to capture and retain water and nutrients. As a result, sites with long-term detrimental soil conditions would have interrupted hydrologic function and poor site productivity. Compacted and/or displaced soils may increase runoff and sediment transport and have lower rates of vegetative recovery. Sites with long-term detrimental soil conditions would have interrupted hydrologic function and poor site productivity. Without mitigation, bare soil surfaces in granitic or serpentine soils can persist more than 50 years following a severe disturbance.

Environmental consequences associated with 31 acres of additional detrimental soil conditions within the project right-of-way within the Trail Creek watershed include:

- **A potential localized increase in sediment mobilization**. The project right-of-way was located to avoid areas with a high likelihood of geologic hazards. No landslides have been identified that pose a threat to the project. The project right-of-way does not cross earthflow terrains in the Trail Creek watershed. Effective erosion control measures and BMPs are required, as shown in the ECRP (see section 2.1.2 for a general discussion of erosion control measures). Additionally, the project would comply with LRMP Standards and Guidelines for the maintenance of effective ground cover. As a result of the dispersal of effects by the linear nature of the project, maintenance of effective ground cover, required application of BMPs, ridge top location, lack of stream crossings and Riparian Reserves impacts, and implementation of the ECRP, it is highly unlikely that amending the LRMP to exceed the soil disturbance thresholds by 31 acres would result in the mobilization of sediment that would change the existing equilibrium or would exceed the natural range of variability in this watershed described in the Trail Creek watershed assessment.

- **A potential localized increase in peak flows**. The project would remove canopy on about 43 acres or about 1.0% of NFS lands in the Trail Creek watershed. FERC noted that this watershed was the most impacted of all of the fifth-field watersheds crossed by the project with respect to canopy removal as a proportion of watershed size. The Trail Creek watershed assessment determined that all subwatersheds in the Trail Creek watershed had low sensitivity to peak flow increases because of the small proportion of the watershed that is in a hydrologically immature condition and the small area that is potentially affected by rain-on-snow events. Analysis by FERC showed that the project was highly unlikely to contribute to increases in peak flows because of the small area affected by the project as a proportion of the watershed. Additionally, the entire project right-of-way within the watershed lies on ridge top locations that have minimal interactions with aquatic systems. The Trail Creek watershed assessment concluded that:

    - *Amount, timing, and delivery of water, sediment, and wood from the forested parts of this watershed are not changed appreciably from the reference conditions due to forest harvest effects on peak flows. Effects would remain inconsequential unless large areas of forest are harvested or burned in the near future.*

  Because the project right-of-way does not intersect any streams on NFS lands in the Trail Creek watershed, there is no direct routing of water to stream channels. Given the ridge top location, lack of stream intersections and impacts to Riparian Reserves, low watershed sensitivity to peak flows, and application of BMPs in construction and rehabilitation of the corridor, it is highly improbable that the amendment of LRMPs to exceed soil compaction limitations in the project right-of-way would change flow regimes from current conditions or from those described in the Trail Creek watershed assessment.

> **A potential loss of site productivity, which may slow vegetative recovery**. Volcanoclastic soils such as those found in the Trail Creek watershed may be low in productivity. Mechanically decompacting the soil to a minimum depth of 20 inches and reestablishing soil organic matter would be a critical first step in rehabilitating the soil toward a more natural condition. Soil rehabilitation would also require recovery of the soil biology, which requires restoration of the soil organic matter and time. Pacific Connector would decompact the corridor, fertilize disturbed areas, reestablish native vegetation (limiting the area directly over the pipe to grasses and shrubs), and scatter slash and large woody debris back across the site to provide for long-term nutrient cycling as required in the ECRP. Off-site mitigation measures contribute to further reducing these watershed effects. Approximately 0.3 mile of existing roads would be decommissioned, and storm proofing is planned on 2.2 miles in the Trail Creek watershed as part of the mitigation plan for the project on NFS lands. Decommissioning roads reduces sediment by allowing reestablishment of effective ground cover and reducing soil compaction, thus increasing infiltration. Decommissioning roads also contributes to reducing peak flow effects by reducing road-stream interactions, increasing infiltration, and reestablishing natural drainage.

Based on this evaluation, it is unlikely that this amendment would prevent attainment of ACS objectives in the Trail Creek watershed.

Off-Site Mitigation Measures

Offsite mitigation measures are intended to provide supplemental actions for projects that cannot be completely mitigated with on-site design features in order to ensure land management objectives are achieved. These mitigation measures also contribute to the “Maintain and Restore” objectives of the ACS. The NFS and Pacific Connector have entered into Agreements in Principle to accomplish off-site mitigation work in the Trail Creek watershed, as shown in table 2-42. BLM-administered lands are not subject to ACS requirements as a result of the August 2016 RODs for two new Resource Management Plans (RMPs) (BLM 2016a, 2016b) that supersede the RMPs amended by the 1994 NWFP ROD. The project proponent has offered voluntary mitigation that could be implemented on BLM lands within this watershed; these mitigation efforts would benefit ACS objectives within the watershed. Forest Service and BLM mitigation measures proposed for this watershed were developed in conjunction with the project proponent based on recommendations in watershed assessments, LSR assessments, and the 2011 Northern Spotted Owl Recovery Plan. Mitigation measures in the Trail Creek watershed are focused on integrated projects that are intended to:

- Restore natural sediment regimes by reducing sediment contributions from roads and potential high-intensity fire.
- Restore historic stand- and fuel-density levels to selected stands.
- Restore elements of aquatic and terrestrial habitat.

TABLE 2-42

Offsite Mitigation Measures on NFS and BLM Lands in the Trail Creek Watershed

Agency	**Project Type**	**Mitigation Group**	**Project Name**	**Project Rationale**
Forest Service	Fuel Reduction	Stand Density Fuel Break	Trail Cr LSR Road Shaded Fuel Break (175 Acres)	High-intensity fire has been identified as the single factor most impacting late successional and old-growth forest habitats on federal lands in the area of the NWFP. Construction of the pipeline and associated activities remove both mature and developing stands and will increase fire suppression complexity. Existing forest roads can provide a fuel break. Fuels reduction along each side of existing roads would increase the effectiveness of the roads as a fuel break. Road shaded fuel breaks will lower the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire.
	Fuel Reduction	Stand Density Fuel Break	Trail Cr. Matrix Integrated Fuels Reduction (500 Acres)	
BLM	Fuel Reduction	Stand Density Fuel Break	Trail Creek Fuel Hazard Reduction (687 Acres)	High intensity fire has been identified as the single factor most impacting LSOG forest habitats on federal lands in the area of the NWFP. Construction of the pipeline and associated activities removes both mature and developing stands and will increase fire suppression complexity, however the corridor also provides a fuel break. Fuels reduction adjacent to the corridor will increase the effectiveness of the corridor as a fuel break. Fuels reduction will lower the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire. This segment is part of the Milo to Shady Cove fuel break and ties in with similar projects on the Umpqua NF.
BLM	Fuel Reduction	Stand Density Fuel Break	Trail Creek Fuel Hazard Maintenance (687 Acres)	This provides a mechanism for maintenance of fuel breaks over time for the life of the project.
Forest Service	Precommercial Thinning	Stand Density Management	Trail Cr. LSR PCT Enhancement (112 Acres)	PCGP will cause direct impacts to existing interior, and developing interior habitat. The project will result in additional fragmentation and preclude the recovery of fragmented habitat for those stands adjacent to the pipeline corridor. Maintenance of the pipeline corridor will provide a continued vector for predators, early seral species, and non-native species. Also, the project will result in a direct loss in biological services provided by mature forest characteristics for many decades past the life of this project. Both mature stands and developing stands will be removed during pipeline construction. Density management of forested stands will assist in the recovery of late-seral habitat, reduce impacts from fragmentation, reduction in edge effects, and enhance resilience of mature stands. Accelerating development of mature forest characteristics will shorten the impacts of the loss of biological services due to pipeline construction. Thinning of young stands is a recognized treatment within LSRs if designed to accelerate development of late-successional habitat characteristics (NWFP ROD page C-12).

TABLE 2-42

Offsite Mitigation Measures on NFS and BLM Lands in the Trail Creek Watershed

Agency	Project Type	Mitigation Group	Project Name	Project Rationale
Forest Service	Road Decommissioning	Road Sediment Reduction	Upper Trail Creek Road Decommissioning (0.3 Miles)	Sediment has been identified by the Upper Rogue Watershed Council as a limiting factor for aquatic habitat in Trail Creek. Road decommissioning reduces habitat fragmentation, reduces road-related sediment, and improves hydrologic connectivity by reducing road density.
BLM	Road Decommissioning	Road Sediment Reduction	Trail Creek Road Decommissioning (2.7 miles)	Sediment has been identified by the Upper Rogue Watershed Council as a limiting factor for aquatic habitat in Trail Creek. The effects of the PCGP are similar to those of a road, including habitat fragmentation and the potential impacts to flow and sediment regimes. Road decommissioning reduces habitat fragmentation, reduces road-related sediment and improves hydrologic connectivity by reducing road density.
Forest Service	Road storm-proofing	Road Sediment Reduction	Trail Creek Road Storm-proofing (2.2 Miles)	Sediment has been identified by the Upper Rogue Watershed Council as a limiting factor for aquatic habitat in Trail Creek. Storm-proofing of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed.
BLM	Road storm-proofing	Road Sediment Reduction	Trail Creek Road Storm-proofing (4.3 Miles)	Sediment has been identified by the Upper Rogue Watershed Council as a limiting factor for aquatic habitat in Trail Creek. The effects of the PCGP are similar to those of a road, including possible impacts to flow and sediment regimes. Storm-proofing of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed.
BLM	Road Surfacing	Road Sediment Reduction	Trail Creek Road Resurfacing (16.3 miles)	Sediment has been identified by the Upper Rogue Watershed Council as a limiting factor for aquatic habitat in Trail Creek. The effects of the PCGP are similar to those of a road, including the potential for sediment mobilization and transport. Road improvement efforts (resurfacing) help to restore hydrologic functions and reduce road-related sediment that could be delivered to stream channels.

TABLE 2-42

Offsite Mitigation Measures on NFS and BLM Lands in the Trail Creek Watershed

Agency	Project Type	Mitigation Group	Project Name	Project Rationale
Forest Service	Snag Creation in Matrix Lands	Upland Terrestrial	Snag Creation (109 Acres)	The project would remove current and future sources of snags, which provide a key wildlife habitat element. Snag creation replaces the existing and potential snags lost in the corridor. Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. Implementation of the project would result in the removal of shading from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel would preclude future recruitment of shading into the channel and associated Riparian Reserves. Placing shading at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term effects from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contribute to the accomplishment of ACS objectives.
BLM	LWD Instream	Aquatic Habitat	Trail Creek LWD (2.6 miles)	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. Implementation of the PCGP project would result in the removal of shading from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel will preclude future recruitment of shading into the channel and associated Riparian Reserves. Placing shading at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.

Cumulative Effects

Activities on NFS Lands

The Forest Service manages about 12% of the Trail Creek watershed; projects on NFS lands (and on BLM lands) that would contribute to cumulative effects with the project are shown in table 2-43.

TABLE 2-43

Current and Reasonably Foreseeable Future Actions on BLM and NFS Lands in the Trail Creek Watershed

Unit	Fifth-Field Watershed	Sixth-Field Watershed	Project Name	Project Description	Resource
UNF	Trail Creek	West Fork Trail Creek	Current Grazing	2,133 ac. cattle grazing	Upland and riparian vegetation, fisheries/aquatic habitat, water quality
UNF	Trail Creek	Upper Trail Creek	Current Grazing	2,270 ac. cattle grazing	Upland and riparian vegetation, fisheries/aquatic habitat, water quality
MD_BLM	Trail Creek	West Fork Trail Creek	Proposed Trail Creek Forest Management. Published in 2012 *Medford Messenger*. NEPA analysis ongoing. Implementation in 2015.	336 acres restoration thinning, 13 acres riparian thinning, 414 acres hazardous fuels treatment, 263 acres precommercial thinning, 8 pump chances restored, block 4 roads, replace 1 culvert, decommission 0.48 mile of road, stream restoration on 0.45 mile	Owls, nesting, roosting, and foraging (NRF) habitat, critical habitat units (CHU), wildlife urban interface (WUI), fish, upland and riparian vegetation, road sedimentation, road density, water quality, sensitive soils
MD_BLM	Trail Creek	Upper Trail Creek	Proposed Trail Creek Forest Management. Published in 2012 *Medford Messenger*. NEPA analysis ongoing. Implementation in 2015.	714 acres restoration thinning, 75 acres riparian thinning, 1,075 acres hazardous fuels treatment, 282 acres meadow restoration, 50 acres small-diameter thinning, 6 pump chances restored, 259 acres roadside firewood cutting, 0.78 mile of temporary roads	Owls, NRF habitat, CHU, WUI, fish, upland and riparian vegetation, road sedimentation, road density, water quality, sensitive soils
MD_BLM	Trail Creek	Lower Trail Creek	Proposed Trail Creek Forest Management. Published in 2012 *Medford Messenger*. NEPA analysis ongoing. Implementation in 2015.	20 acres restoration thinning, 1,044 acres hazardous fuels treatment, and 2 pump chances restored	Owls, NRF habitat, CHU, WUI, fish, upland and riparian vegetation, road sedimentation, road density, water quality, sensitive soils

These activities are expected to be consistent with the Standards and Guidelines and objectives of the Umpqua National Forest LRMP. Restoration thinning and hazardous fuels reductions are expected to contribute to improvements in watershed conditions by reducing stand density and reducing the probability of stand-replacing fire. Road improvements and decommissioning are expected to reduce road-related sediment transport to aquatic systems.

Activities on BLM and Private Lands

The BLM accounts for about 42% and private lands comprise about 46% of the Trail Creek watershed. Projects that might contribute to cumulative effects within the project right-of-way are shown in in table 2-43. Private lands in the watershed are expected to be managed according to current land use patterns consistent with the Douglas County General Plan and existing federal and state statutes, including the Oregon Forest Practices Act and the Clean Water Act. Most of the private lands in the watershed are small ranches where the dominant use is grazing.

Cumulative Effects

The PCGP corridor comprises about 1.42% of the NFS lands, 0.53% of BLM lands, and 0.57% of private lands in the Trail Creek watershed (table 2-37). The small proportion of the landscape affected by the project; ongoing land management on private lands; the regulatory framework between the BLM, ODEQ, and ACOE applicable to the project; and the project location and routing make it highly unlikely that the portion of the Pacific Connector project on federal lands, when considered with other past, present, and reasonably foreseeable future actions, would change watershed conditions in the Trail Creek watershed in any significant, discernible, or measurable way. See also 2019 FEIS section 4.4, Cumulative Effects.

Project Effects Compared by ACS Objective

Table 2-44 compares the project impacts to the objectives of the ACS for the Trail Creek watershed. NFS lands where the ACS applies comprise about 12% of the Trail Creek watershed (table 2-37). Watershed conditions and recommendations are found in the Trail Creek watershed assessment (BLM 1999b) and described in detail in preceding sections of this chapter. In the Trail Creek watershed, timber harvest and removal of LWD from creek channels has reduced the structural complexity of the aquatic habitat and its ability to retain sediments. Chronic fine-grained sediment, most recently related to roads and timber harvest, has negatively affected aquatic habitats by adding large volumes of sediment above the geomorphic background rate during recent geologic time (i.e., Holocene and Anthropocene Epochs, 10,000 BCE to 1,800 ACE). The presence of roads has segregated some stream reaches from upslope habitats that are needed for replenishment of LWD. The project would not affect any Riparian Reserves in the watershed (table 2-40).

TABLE 2-44

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Trail Creek Watershed

ACS Objective	Project Impacts
Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	Riparian Reserves are watershed landscape-scale features that would be affected by the project; however, no Riparian Reserves are affected in the Trail Creek watershed (table 2-41). On NFS lands subject to the ACS, the project right-of-way is located primarily in early- or mid-seral forests (table 2-41). There are no river or stream crossings on NFS lands, and the project right-of-way is located largely on or near ridge tops to minimize impacts on aquatic habitats. No wetlands or streams are crossed or clipped in the watershed. Use of native vegetation and the anticipated rapid revegetation of disturbed areas would likely further reduce project impacts. Off-site mitigation measures including road storm-proofing and decommissioning are expected to improve watershed conditions in the Trail Creek watershed.
Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life-history requirements of aquatic and riparian-dependent species.	The project is not expected to affect spatial or temporal connectivity in the Trail Creek watershed because no wetlands or waterbodies are crossed. No rivers or streams would be crossed on NFS lands.
Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	No stream channels are crossed on NFS lands where the ACS applies so the physical integrity of banks and stream bottoms would not be affected.

TABLE 2-44

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Trail Creek Watershed

ACS Objective	Project Impacts
Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	No wetlands or streams are crossed on NFS lands in the Trail Creek watershed. No long-term impacts on water quality are expected because of application of the ECRP, including maintenance of effective ground cover and BMPs during construction (see section 1.4.1 and previous discussion).
Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.	The Trail Creek watershed was historically characterized by pulse-type depositions of coarser sediments from landslides and surface erosion following major disturbances such as fires and high-intensity winter storms (BLM 1999b, Everest and Reeves 2007). Chronic erosion and deposition of fine sediments, primarily from roads and to a lesser degree from land use have replaced these pulse-type disturbances in the watershed. Project construction and operation are not likely to alter sediment erosion and deposition in the watershed nor are they likely to exacerbate these conditions. Proposed mitigation projects would contribute to a reduction of adverse sediment scouring and deposition and restoration of aquatic functions.
Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.	The project is not likely to affect peak flows in the Trail Creek watershed because of its predominately ridge top location, the relatively small area of the watershed affected (less than 1%), the absence of stream crossings, and the relative lack of connectivity to aquatic systems. The Trail Creek watershed assessment noted that increases in peak flows are a low risk in all of the subwatersheds and in the watershed as a whole.
Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	The project would not cross any meadows or wetlands in the Trail Creek watershed on NFS lands, so there would be no impact from the project on water tables or seasonal inundation of these areas
Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation; nutrient filtering; and appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse, woody debris sufficient to sustain physical complexity and stability.	The project would not affect Riparian Reserves in the Trail Creek watershed (table 2-39). Following construction, replanting with native species would facilitate reestablishment of vegetation communities.
Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	The project would not affect any Riparian Reserves in the Trail Creek watershed (table 2-39). Consistent with the requirements of the POD, LWD and boulders removed from the corridor during construction would be replaced to restore and stabilize channel crossings. Revegetation would be accomplished using native riparian species. The project would waive application of Management Recommendations for Survey and Manage species in the watershed but would not threaten the persistence of riparian-dependent Survey and Manage species or prevent attainment of the ACS objectives (see appendix F.5).

Summary

Given the ridge top location of the pipeline corridor on NFS lands, the lack of intersections with waterbodies, and the lack of impacts to Riparian Reserves, it is highly unlikely that project construction and operation would prevent attainment of ACS objectives on NFS land in the Trail Creek watershed.

The high clay content soils in the watershed (BLM 1999:1-4) presents a potential issue with respect to possible compaction and sediment that could be mobilized by overland flow. Subsoil ripping (including the use of hydraulic excavators) is a proven method of reducing soil compaction. Measures in the ECRP, including soil remediation with organic materials, rapid revegetation, and maintenance of effective ground cover, are likely to control surface erosion. The Forest Service may require additional erosion control measures if needed.

Off-site mitigation measures identified by the Forest Service and BLM would supplement onsite minimization, mitigation, and restoration actions. These proposed offsite mitigation measures are responsive to recommendations in the Trail Creek watershed assessment and would contribute to improving terrestrial and aquatic conditions within the watershed (see table 2-42).

A site-specific amendment of the Umpqua National Forest LRMP to waive the limitation on detrimental soil compaction is proposed to provide for the project. This proposed amendment is minor in scope and is not expected to prevent attainment of ACS objectives because of implementation of the ECRP and the fact that there are no stream intersections on NFS lands in the Trail Creek watershed. The proposed amendment of the Umpqua National Forest LRMP to waive protection measures for Survey and Manage species would not prevent attainment of ACS objectives (see appendix F.5).

The relatively small area of NFS land affected by project construction (50.27 acres, or 1.15% of NFS lands) makes it highly improbable that project impacts could affect watershed conditions beyond the site scale. Although there are project-level impacts such as short-term surface erosion, these would be minor and limited to the boundaries of the project area (see section 1.4.1).

No project-related impacts that would retard or prevent attainment of ACS objectives have been identified (see table 2-44). Impacts, as they relate to relevant ecological processes, are within the range of natural variability for watersheds in the Western Cascades, High Cascades, and Klamath-Siskiyou Provinces, although some of these processes have been altered from their natural condition (see table 2-40).

2.2.2.4 Little Butte Creek Fifth-Field Watershed, HUC 1710030708

Overview

The Little Butte Creek fifth-field watershed (figure 2-10) is located in the southern Cascades Mountain Range in southwestern Oregon about 10 miles southeast of Medford. The Little Butte Creek watershed is a Tier 1 Key Watershed above the confluence of the North and South Forks of Little Butte Creek. It is one of eight fifth-field watersheds in the 2,618-square-mile Upper Rogue River Subbasin. The Upper Rogue River Subbasin is one of five subbasins within the Rogue River Basin. The entire Rogue River drainage basin is about 132 miles wide (east to west). See figure 1-1 for the regional setting of this watershed and its relationship to the other fifth-field watersheds traversed by the project right-of-way.

The watershed lies south of the Rogue River, with Little Butte Creek draining in a northwest direction. Major tributaries include Antelope Creek and the North and South Forks of Little Butte

Creek. The North Fork begins at Fish Lake (northeast corner of the watershed), while the South Fork begins near the eastern boundary in the Fourmile Creek watershed. The North Fork headwaters are considerably lower in elevation than those of the South Fork. The two forks meet to form the main stem of Little Butte Creek near Lake Creek (elevation of 1,647 feet amsl). Little Butte Creek then continues in a northwest direction for 17 miles through the communities of Eagle Point and White City before emptying into the Rogue River about 3 miles west of Eagle Point at the junction of the Little Butte Creek and Shady Cove–Rogue River fifth-field watersheds. The Rogue River then turns westward and flows through the Rogue River–Siskiyou National Forest and the Klamath Mountains, discharging to the Pacific Ocean at Gold Beach, Oregon, about 32 miles north of the California border.

The Little Butte Creek watershed lies mainly in Jackson County (354 square miles), but the eastern extremity is in Klamath County (19 square miles). Elevations range from 1,204 feet amsl at the confluence of Little Butte Creek and the Rogue River to 9,495 feet amsl at the top of Mount McLaughlin on the northeastern divide with the Big Butte Creek fifth-field watershed. Average land elevation over the entire watershed is 3,496 feet. About 31% of the watershed is in the TSZ, where warm rain-on-snow events contribute to peak flow events.

The city of Eagle Point is the only municipality within the watershed boundary, but unincorporated White City borders along the same lower reach, and the unincorporated settlements of Waynsboro and Lake Creek are also found along the valley portions of the watershed. The eastern portion of the city of Medford approaches the western edge of the watershed. In this vicinity, the Interstate 5 corridor lies about 5 miles from the watershed. State Highway 140, which connects Medford and Klamath Falls, is a major transportation corridor through the watershed. Other major roads include State Highway 62, Highway 722 (Dead Indian Memorial Highway), County Road 1000, and South Fork Little Butte Creek, Lake Creek, and Antelope Creek roads.

Farming (especially orchards), forestry, and cattle grazing dominate human land use in the watershed. The BLM manages 28 grazing allotments and the Forest Service manages four grazing allotments in the watershed. Water withdrawals from Little Butte Creek associated with agricultural and domestic uses constitute a major concern for aquatic water and habitat quality.

Much of the terrain in the Little Butte Creek watershed is transitional between the Klamath-Siskiyou Province and the High Cascades Province. The western and central portions where most federal land is BLM-administered are generally in the Klamath-Siskiyou Province. The eastern, higher elevation portion where most NFS land occurs is generally in the High Cascades Province[30].

Soft volcanic materials dominate the geology of the Cascades Range portion of the watershed. Lava flows of basaltic-andesite, basalt, and andesite are the dominant rock types from composite and shield volcanic eruptive vents. These lavas are interlayered with softer pyroclastic flows of andesitic tuff, basaltic breccia, ash flow tuff, dacite tuff, and andesitic breccia. These pyroclastic materials often interfinger with the lavas, making the area subject to landsliding during rain-on-snow or intense storm events. The pyroclastics have a higher porosity than the lava flows, and,

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[30] Provinces discussed in this document are based on both ecological and geological conditions and therefore do not match those recognized by the Oregon Department of Geology and Mineral Industries and the Oregon State Board of Professional Geologists and Geophysicists. The Klamath-Siskiyou Province is known by professional geologists as the Klamath Mountains Province and the Western Cascades and the High Cascades are two mountain ranges within the Cascades Mountains Province. See https://www.oregongeology.org/learnmore/geologicsightseeing.htm

hence, landslides initiate from these units as ground water levels increase after rainfall. As a result of landslides and surface erosion processes, the landscape is deeply dissected, with a well-developed dendritic drainage pattern. The clay content of the soils is high (particularly in the subsoil), resulting in low infiltration rates.

In the eastern portion of the watershed and a small part of the central portion along the north-central watershed divide with the Big Butte Creek watershed, High Cascades volcanic deposits prevail. These deposits consist of much younger and harder lava flows that have developed from large composite and shield volcanos. Volcanism from these local vents produced the more prominent peaks that form the High Cascades including Brown Mountain and Mount McLoughlin, which appear in sharp contrast to the older rock formations and complexes of the Western Cascades topography. Rock types include basaltic-andesite, andesite, and basalt lavas. Most of these lava flows were from the north and east, overlapping the eastern margin of the Western Cascades. As a result, a high plateau developed above the older topography. Since the geological substrate is less erodible and more stable than in the Western Cascades, the landscape is much less dissected. Soils are generally shallower and less weathered and have high infiltration rates.

Most of the large alluvial stream terraces located above the floodplains in the western third of the watershed developed during the formation of the High Cascades. These terraces consist of unconsolidated deposits of gravel, cobbles, and boulders intermixed and interlayered with clay, silt, and sand. The alluvium and valley bottom are much wider in the western part of the watershed. Large portions of the western and central portions of the watershed have moderately stable to unstable soils due to steep slopes, moderate precipitation rates, and the natural weakness of many of the volcanic soil/rock types of the Western Cascades.

The 373.0-square-mile (238,879-acre) Little Butte Creek watershed includes 12 subwatersheds, nine of which (moving from northwest to southeast, Lick Creek, Salt Creek, Lake Creek, Lower North Fork Little Butte Creek, Lower South Fork Little Butte Creek, Upper North Fork Little Butte Creek, Upper South Fork Little Butte Creek, Middle South Fork Little Butte Creek, and Beaver Dam Creek) are crossed by the project right-of-way (figure 2-10 and table 2-45). The watershed is bounded on the northwest to the northeast by the Shady Cove–Rogue River and Big Butte Creek watersheds, on the east by the Fourmile Creek fifth-field watershed, on the south by several fifth-field watersheds of the Upper Klamath watershed, and on the west by the Rogue River–Gold Hill and Bear Creek subwatersheds of the Middle Rogue River Subbasin.

The region experiences a Mediterranean-type climate, with mild, wet winters and hot, dry summers. The general area has the highest summer temperatures and lowest annual precipitation in western Oregon. Summer weather is dominated by the Pacific high-pressure system. Annual precipitation ranges from 22 inches at the lower elevations to 66 inches in the upper reaches of the watershed. July through October is the driest period, while December through April is the wettest. Winter precipitation at elevations above 5,000 feet amsl typically occurs as snow, with spring melting and runoff occurring from April through June. Rainfall predominates below 3,500 feet amsl. Between the two (i.e., in the TSZ) is a mix of rain and snow in winter. Locally intense thunderstorm precipitation events may occur during summer months.

The Little Butte Creek watershed contains approximately 784 miles of streams, based on BLM and Forest Service GIS layers. This includes about 167 miles of fish-bearing (and perennial) streams, 69.9 miles of perennial nonfish-bearing streams, and 547.4 miles of intermittent streams

(BLM and Forest Service, 1997: 36). The watershed also contains 1,383.0 acres of palustrine wetlands and 393.0 acres of lacustrine wetlands. Headwater areas are dominated by dendritic drainage patterns with first- and second-order streams comprising 80% of the stream miles. Sediment and loss of LWD and large wood recruitment along streams from logging activity have negatively impacted many of the streams in the watershed.

Streamflow patterns reflect the distribution of precipitation. The range of elevations across the watershed results in a variety of runoff events, including rain, rain-on-snow, and snowmelt. Partial to total snow melt typically occurs in the TSZ during warm mid-winter rain-on-snow events and is associated with nearly all major peak flows. Thirty-four percent of the surface runoff from the watershed is collected from rain, 31% from rain-on-snow events, and 35% from snowmelt.

Agricultural production (farms, orchards, and cattle grazing) requires annual withdrawal of many thousands of acre feet of water from Little Butte Creek for irrigation. The Medford Water Commission services customers throughout the Rogue Valley with water from Little Butte Creek from about April to September. An extensive canal system facilitates these withdrawals. The resulting low flows in summer are accompanied by elevated temperatures, hearty bacterial growth, and other water quality problems.

The vegetation in the watershed is very diverse. Approximately 65% of the total area, mainly in the higher elevations, consists of temperate coniferous forest. Low elevations are characterized by dry pine/oak woodland savannahs (chaparral). Virtual elimination of fire due to fire suppression efforts has resulted in high stocking levels, which in turn have caused poor tree growth and the success of many non-preferable species. Grass/oak savannahs have become choked with brush, and open ponderosa pine stands have developed dense understories of Douglas-fir and white fir. Fire suppression has also resulted in accumulation of dead fuels. Under drought conditions, these fuel loads may cause large, high-intensity fires.

Figure 2-10 shows the more contiguous NFS lands in the eastern uplands and the checkerboard pattern of BLM lands in the western and central portions of the watershed. Approximately 25.1% of the land in the watershed is within the Rogue River–Siskiyou National Forest. Substantial acreages of NFS lands are found in only the four easternmost subwatersheds: the Upper North Fork, Upper South Fork, Middle South Fork, and Beaver Dam Creek subwatersheds. Approximately 22.9% of the land in the watershed is managed by the BLM Medford District, and 52.0% of the land is privately owned.

Matrix[31] lands account for about 5.40% of the NFS land in the watershed, and LSRs account for 88%. Riparian Reserves, which occur in both the matrix and LSR land allocations, account for an estimated 8,096.50 acres, or 13.52%, of the NFS lands in the Little Butte Creek watershed (table 2-45). There is an additional 0.02 acre of unmapped LSR associated with KOACs [32] on NFS lands in the watershed.

Location and Routing

The project enters the Little Butte Creek fifth-field watershed from the Big Butte Creek fifth-field watershed at MP 135.04 (figure 2-10). After entering the Lower North Fork subwatershed, the

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[31] Matrix is an NFS land allocation.

[32] Known Owl Activity Centers (KOAC) are relevant only on NFS lands.

project right-of-way runs along subwatershed divides through the majority of the watershed. A major exception is in the northeast corner of the Middle South Fork and western half of the Upper South Fork subwatersheds (figure 2-10). In 2019, FERC proposed a reroute of the project right-of-way around MP 166.4. This reroute avoids crossing the Pacific Crest Trail and ensures the project would meet the visual quality objectives of the Rogue River National Forest LRMP. The reroute increases the project right-of-way by approximately 0.12 mile and would bore underneath one perennial stream in the Upper South Fork subwatershed (at approximately MP 167.67). The project right-of-way exits the watershed near MP 168, moving into the Spencer Creek fifth-field watershed of the Upper Klamath Basin.

In all, the project right-of-way travels through 33.05 miles of the Little Butte Creek watershed. On NFS lands, the project right-of-way traverses approximately 13.87 miles in the six easternmost subwatersheds crossed by the project.

A total of 611.52 acres of land would be affected by the project right-of-way in the Little Butte Creek watershed, of which 512.82 acres would be cleared and 98.7 acres would be modified. On NFS lands, there would be 209.32 acres cleared and 71.4 acres modified, which constitute 0.47% of the total affected acres (table 2-46). The largest NFS effects occur in the five eastern subwatersheds and constitute 0.49% of the NFS land.

No matrix lands are affected by the project in the Little Butte Creek watershed. The project alignment would affect 279.66 acres of LSR, which accounts for 0.53% of the NFS lands in the watershed. Approximately 10.22 acres of Riparian Reserves on NFS lands would be affected by the project, which accounts for roughly 0.02% of the NFS lands in the watershed.

Two perennial streams (South Fork Little Butte Creek, MP 162.45, and unnamed tributary, MP 167.67) and one intermittent stream would be crossed on NFS lands in the Little Butte Creek watershed (table 2-48). The Riparian Reserves of one intermittent stream would be clipped by the project right-of-way, but the associated waterbody would not be crossed. In total, 7.66 acres of Riparian Reserves would be cleared and 2.56 acres would be modified (table 2-47), which constitutes 0.13% of the Riparian Reserves in the watershed (table 2-47). Approximately 3.70 acres of LSOG in Riparian Reserves would be cleared in the project right-of-way (table 2-48). The PCGP pipeline would dig a boring pit on either side of the Riparian Reserve and use a conventional bore to avoid the unnamed perennial stream located at approximately MP 167.67. This method does not result in any Riparian Reserves being cleared at this crossing. Table 2-49 delineates the stream crossing turbidity and risk rating by the green, blue, and yellow rating categories.

Figure 2-10 PCGP Routing and Subwatershed Boundaries, Little Butte Creek Watershed

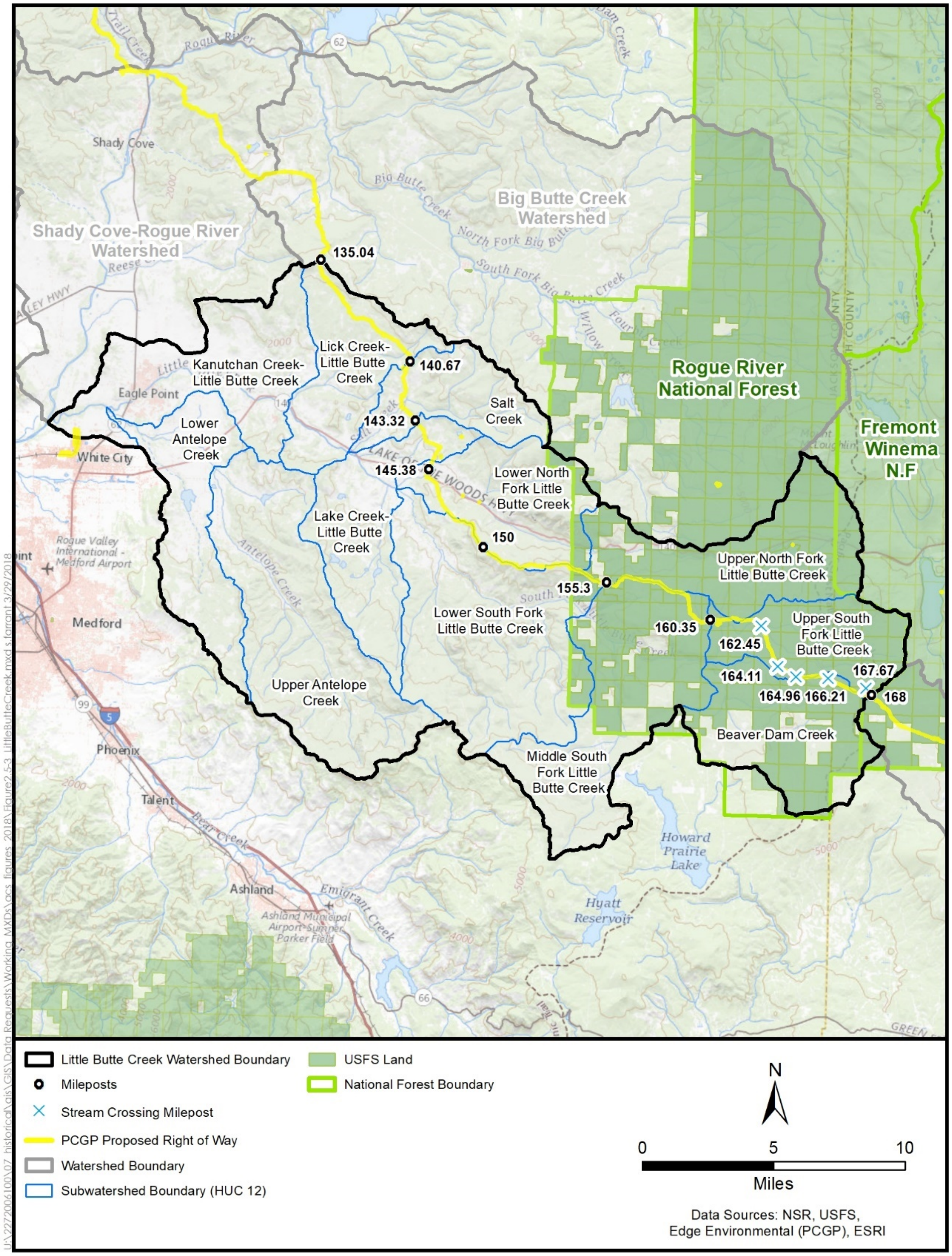

TABLE 2-45

Land Ownership and Forest Service Land Allocations (acres) in Little Butte Creek Fifth-Field Watershed (HUC 1710030708)

	Land Ownership (acres)					**Forest Service Land Allocation (acres)**		
Sixth-Field Watershed	**Sixth-Field Watershed (acres) a/**	**NFS Land**	**BLM**	**Total NFS and BLM**	**Other**	**LSR**	**Riparian Reserves b/**	**Matrix**
Beaver Dam Creek	17,862.75	12,989.80	599.03	13,588.83	4,273.92	12,512.25	2,855.48	435.26
Kanutchan Creek	21,959.17	0.00	3,732.43	3,732.43	18,226.74	0.00	0.00	0.00
Lake Creek	16,974.66	0.00	4,023.36	4,023.36	12,951.30	0.00	0.00	0.00
Lick Creek	14,838.25	0.00	5,619.05	5,619.05	9,219.20	0.00	0.00	0.00
Lower Antelope Creek	16,096.61	0.00	294.91	294.91	15,801.70	0.00	0.00	0.00
Lower North Fork Little Butte Creek	15,714.05	1,344.23	5,948.61	7,292.84	8,421.21	320.10	152.25	1,014.48
Lower South Fork Little Butte Creek	33,078.77	1,572.84	14,950.78	16,523.62	16,555.15	1,557.48	161.46	0.00
Middle South Fork Little Butte Creek	26,193.88	12,427.33	5,495.86	17,923.19	8,270.69	12,315.57	1,726.75	0.00
Salt Creek	11,029.22	0.47	4,698.08	4,698.55	6,330.67	0.00	0.00	0.43
Upper Antelope Creek	32,108.75	0.00	9,480.66	9,480.66	22,628.09	0.00	0.00	0.00
Upper North Fork Little Butte Creek	20,358.40	18,901.65	0.00	18,901.65	1,456.75	13,447.78	1,623.64	1,777.87
Upper South Fork Little Butte Creek	12,664.06	12,664.06	0.00	12,664.06	0.00	12,659.47	1,576.92	3.63
Watershed Total	**238,878.57**	**59,900.38**	**54,842.77**	**114,743.15**	**124,135.42**	**52,812.65**	**8,096.50**	**3,231.67**

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a/ All data derived from Stantec-based GIS layers.
b/ May occur within other NFS land allocations.

TABLE 2-46

Project Corridor (miles) and Project Area (acres) in Little Butte Creek Fifth-Field Watershed (HUC 1710030708) by Land Ownership

Sixth-Field Watershed a/	NFS Lands Only: Corridor Length (miles)	NFS Lands Only: Project Area (acres) Cleared	NFS Lands Only: Project Area (acres) Modified	NFS Lands Only: % of NFS Land Impacted	Entire Sixth-Field Watershed, All Ownerships: Corridor Length (miles)	Entire Sixth-Field Watershed, All Ownerships: Project Area (acres) b/ Cleared	Entire Sixth-Field Watershed, All Ownerships: Project Area (acres) b/ Modified	Entire Sixth-Field Watershed, All Ownerships: % of Sixth-Field Watershed Impacted
Beaver Dam Creek	1.33	17	8.89	0.20	1.33	17	8.89	0.14
Kanutchan Creek	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lake Creek	0.00	0.00	0.00	0.00	2.09	31.31	0.45	0.19
Lick Creek	0.00	0.00	0.00	0.00	5.63	82.24	14.39	0.65
Lower Antelope Creek	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lower North Fork Little Butte Creek	0.05	0.89	0.72	0.12	5.70	82.01	8.21	0.57
Lower South Fork Little Butte Creek	1.0	12.71	4.94	1.12	3.84	72.91	7.93	0.24
Middle South Fork Little Butte Creek	3.59	51.98	21.13	0.59	3.59	53.96	21.13	0.29
Salt Creek	0.00	0.00	0.00	0.00	2.66	42.76	1.50	0.40
Upper Antelope Creek	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Upper North Fork Little Butte Creek	1.88	25.57	7.83	0.18	2.19	29.46	8.31	0.19
Upper South Fork Little Butte Creek	6.02	101.17	27.89	1.02	6.02	101.17	27.89	1.02
Watershed Total	**13.87**	**209.32**	**71.4**	**0.47**	**33.05**	**512.82**	**98.7**	**0.26**

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a/ All data derived from Stantec-based GIS layers.
b/ Includes NFS, BLM, and other ownerships.

TABLE 2-47

Project Area (acres) on NFS Lands in the Little Butte Creek Fifth-Field Watershed (HUC 1710030708) by Land Allocation

Sixth-Field Watershed a/	Designated LSR b/				Matrix				Riparian Reserves b/			
	Project Area (acres)		% of Total LSR on NFS Land		Project Area (acres)		% of Total Matrix on NFS Land		Project Area (acres)		% of Total Riparian Reserves on NFS lands c/	
	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified
Beaver Dam Creek	17	8.89	0.14	0.07	0.00	0.00	0.00	0.00	0.90	0.58	0.03	0.02
Kanutchan Creek	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lake Creek	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lick Creek	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lower Antelope Creek	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lower North Fork Little Butte Creek	0.89	0.72	0.28	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lower South Fork Little Butte Creek	12.94	4.96	0.83	0.32	0.00	0.00	0.00	0.00	0.31	0.14	0.19	0.09
Middle South Fork Little Butte Creek	51.88	21.13	0.42	0.17	0.00	0.00	0.00	0.00	0.88	0.31	0.05	0.02
Salt Creek	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Upper Antelope Creek	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Upper North Fork Little Butte Creek	23.76	7.83	0.17	0.06	0.00	0.00	0.00	0.00	0.83	0.00	0.05	0.00
Upper South Fork Little Butte Creek	101.66	28	0.80	0.22	0.00	0.00	0.00	0.00	4.75	1.53	0.30	0.10
Watershed Total	**208.13**	**71.53**	**0.39**	**0.14**	**0.00**	**0.00**	**0.00**	**0.00**	**7.66**	**2.56**	**0.09**	**0.03**

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a/ All data derived from Stantec-based GIS layers.
b/ Includes mapped and unmapped LSR on NFS lands.
c/ Riparian Reserve acres overlap with LSR and matrix land allocations.

TABLE 2-48

Riparian Reserve Effects in the Little Butte Creek Watershed HUC 1710030708

Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres)														Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats c/	Gross Riparian Reserves	Fish Bearing	Anadromy d/
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80+)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40)	Stream Channel or Wetland Area	Net Riparian Reserve Cleared						
Upper South Fork Little Butte Creek HUC 171003070803 (Tier 1 Key Watershed)																												
RRNF	162.45	ASP165 South Fork Little Butte Creek	2-30' wide, U-shaped,1% gradient, braided channels	P	Yes	19.62		No	1.38			**1.38**				**0.00**	1.16			**1.16**	0.04	**2.58**	0.08	**2.66**		**2.66**	Yes	No
RRNF	164.11	EW075	RR of adjacent emergent wetland in forest clearing.	W	No	0.00		Yes	0.13			**0.13**				**0.00**	0.39			**0.39**		**0.52**	0.26	**0.78**		**0.78**	No	No
RRNF	164.96	ASI164	RR of lateral stream clipped	I	No	0.00		Yes				**0.00**	0.28			**0.28**				**0.00**		**0.28**	0.12	**0.40**		**0.40**	No	No
RRNF	167.67*		RR avoided with boring		Yes	4		No																				
Subtotal Upper South Fork Little Butte Creek		**Crossed:** **2 Per. Channel**	**Clipped:** **1 wetland RR** **1 Int. Stream RR**		**2**			**2**	**1.51**	**0.00**	**0.00**	**1.51**	**0.28**	**0.00**	**0.00**	**0.28**	**1.55**	**0.00**	**0.00**	**1.55**	**0.04**	**3.38**	**0.46**	**3.84**	**0.00**	**3.84**	**1**	**0**
Beaver Dam Creek HUC 171003070804 (Tier 1 Key Watershed)																												
RRNF	166.21	ESI076 (ESI084) Daley Creek	30-40' wide braided channel, coble/gravel substrate, trib. to Daley Creek	I	Yes	26.51		No				**0.00**				**0.00**		0.73	0.20	**0.93**	0.10	**1.03**	0.63	**1.66**		**1.66**	No	No
Total Little Butte Creek Watershed (Key Watershed)																												
Total Key Watershed		Crossed: 3 Int. Channels 1 Per. Channel 1 Wetland	Clipped: 1 Int. Stream RR 1 Wetland RR		6		0.01	2	1.51	0.00	0.00	1.51	0.84	0.00	0.00	0.84	4.81	0.73	0.20	5.74	0.14	8.23	1.09	9.32	0.35	9.67		

TABLE 2-48

Riparian Reserve Effects in the Little Butte Creek Watershed HUC 1710030708

									Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres)																			
Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80+)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40)	Stream Channel or Wetland Area	Net Riparian Reserve Cleared	Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats c/	Gross Riparian Reserves	Fish Bearing	Anadromy d/

RR = Riparian Reserve

a/ "Crossed" indicates that the pipeline trench crosses the waterbody or wetland.

b/ "Clipped" indicates that the pipeline corridor or TEWA clearing crosses a portion of the Riparian Reserve, but the pipeline trench does not cross the associated waterbody.

c/ Roads and other altered habitats such as rock pits sometimes occur within Riparian Reserves. These features do not have riparian features and are not considered as part of the Riparian Reserve vegetated area.

d/ "Anadromy" means that a stream contains anadromous fish or that it is a tributary that directly influences an anadromous stream.

* Crossing at MP 167.67 would be constructed with a boring method underneath the existing perennial stream, and therefore no Riparian Reserves would be cleared as a result of the project right-of-way.

TABLE 2-49

Stream Crossing Turbidity and Risk Assessment

Fifth-Field Watershed	Sixth-Field Sub-watershed	MP	Type a/	Description a/	Bankfull Width (ft) b/	Width of Crossing (ft) a/	Channel Gradient (%) b/	Channel Incision (ft) b/	Bank Character b/	Streambed Material b/	Turbidity Rating c/	Site Response Rating d/	Construction Impact Rating d/	Overall Rating e/
Little Butte Creek	Upper SF Little Butte Cr.	162.45	P	U-shaped,1% gradient,	22	19.62	0.87		Erosion resistant	Gravel/ cobble	M	M	M	YELLOW
Little Butte Creek	Beaver Dam Cr.	166.21	I	30-40’ wide braided channel, cobble/gravel substrate, Daley Creek.		26.51				Cobble gravel	L	L	L	BLUE
Little Butte Creek	Unnamed.	167.67	N/A											N/A f/

Sources:
a/ Table 2A-3a, Resource Report 2, Water Use and Quality, PCGP 2013
b/ Table A-2, Stream Crossing Risk Analysis, GeoEngineers 2011
c/ Table B-1, Turbidity, Nutrients and Water Quality Analysis, GeoEngineers 2011
d/ Table A-1, Stream Crossing Risk Analysis, GeoEngineers 2011
e/ Figure 4, Stream Crossing Risk Analysis, GeoEngineers 2011
f/ - This feature was not rated because the bore would completely avoid the channel.

Existing Conditions Little Butte Creek Watershed, HUC 1710030708

In 1997, the Forest Service and BLM prepared an interagency watershed assessment for federal lands in the Little Butte Creek watershed (BLM and Forest Service 1997). The Little Butte Creek Watershed Council completed an assessment that addressed issues throughout all ownerships in the watershed in 2003.

Original Watershed Analysis Findings

- Soils on the young volcanic landforms associated with the High Cascades Province (i.e., plateaus, valley floors, and stream channels) where the project is routed have higher infiltration rates than the older landforms of the Western Cascades Province in the Little Butte Creek watershed. Erosion potential is characterized as slight to moderate on these plateaus and valley floors and moderate to high in the associated stream channels.

- The key aquatic issue in the watershed is water quality. High-priority issues that affect water quality and limit factors for long-term sustainability of native fish and other aquatic species in this watershed are temperature, habitat modification, and sedimentation.

- Water withdrawals and transbasin diversions have had the greatest impact on summer stream flows in the Little Butte Creek watershed. Except for the smallest tributaries, all of the streams in the Little Butte Creek watershed have been over allocated for water rights during the summer season. This means that there are more legal rights to water than there is water in the system (Little Butte Creek Watershed Council 2003). The majority of water diverted from streams in the watershed is used for irrigation. Transbasin diversions out of the Little Butte Creek watershed dramatically decrease stream flows in the diverted tributaries and downstream reaches during the irrigation and reservoir storage seasons.

- The South Fork Little Butte Creek is CWA section 303(d) listed for flow modification, habitat modification, sediment, and temperature from the mouth to the confluence of Beaver Creek. The project right-of-way crosses the South Fork Little Butte Creek, a perennial stream, and Daley Creek, an intermittent stream, several miles above the confluence of Beaver Creek. The reach of the South Fork Little Butte Creek and Daley Creek crossed by the project is not 303(d) listed.

- Removal of LWD in past fuel treatments has affected site productivity. Maintaining the maximum levels of LWD consistent with reasonable fuel loadings appears to have considerable potential for enhancing site quality. Mid-seral stands with no LWD may have yields 12% lower than stands with sufficient LWD (BLM and Forest Service 1997: 75).

- The Little Butte Creek watershed assessment suggests that roads contribute the greatest amount of sediment to streams in the watershed. Roads located in unstable areas and adjacent to streams, as well as those with inadequate drainage control and maintenance and no surfacing, are most likely to cause sedimentation of stream habitats. Stream-adjacent roads confine the channel and restrict the natural tendency of streams to move laterally. Roads crossing through riparian areas have fragmented riparian habitat connectivity. Some culverts impede or prevent fish passage. Road density (all ownerships) described in the watershed assessment is 3.3 miles per square mile. Two sections (T37, R3E, section 12;

T37 S, R4E, section 14) have road densities of 4.4 miles per square mile and 6.0 miles per square mile, respectively.

- Peak flows associated with past rain-on-snow events have altered the South Fork Little Butte Creek by eroding streambanks, scouring channels, and removing LWD. Peak flow effects on the primary channels within the subwatershed are not expected to change noticeably in the future. Peak flows in the headwater streams are expected to decrease slightly as the areas recover hydrologically. Reduced harvest and restoration efforts under the existing land allocations within the LRMP would accelerate the recovery process. Roads would continue to affect peak flows. At the time it was prepared, the Little Butte Creek watershed assessment estimated conservatively that vegetation in the South Fork Little Butte Creek subwatershed was 72% hydrologically recovered. This is at or above the Umpqua National Forest LRMP threshold of 70% for increasing peak flows by removing vegetation in the timber types on the Dead Indian Plateau.

- High stream temperatures (approximately >70°F) are lethal to fish and limit summer rearing habitat in Little Butte Creek watershed. Summer stream temperatures vary throughout the watershed, with cooler temperatures generally found in most headwater streams. Elevated summer water temperatures are a limiting factor in Little Butte, North Fork Little Butte (below the National Forest boundary), South Fork Little Butte (below Beaver Dam Creek), and Antelope, Conde, and Dead Indian creeks.

- Stream temperatures for the mainstems of Little Butte, North Fork Little Butte, and South Fork Little Butte creeks tend to show a correlation with elevation: cooler stream temperatures are found in the stream reaches at higher elevations. Federal lands (located at higher elevations) account for 75 to 85% of the viable salmonid production during summer months. Stream temperatures on the lower reaches of these streams are warm to near-lethal (physiologically stressful) or lethal for salmonids and other native fishes (sculpins, suckers, lamprey, etc.) during summer months due to habitat alteration. Warm stream temperatures limit fish production (growth) and occupation of habitat.

Changes in Watershed Condition

The following projects or natural disturbance events have occurred on NFS lands since the watershed assessment was written in 1997 (table 2-50).

TABLE 2-50

Changes in Watershed Condition Since Publication of the Little Butte Creek Watershed Assessment

Subwatershed	Fires or Other Terrestrial Disturbance Events	Flood or Channel Forming Events	Recommended Watershed Assessment Restoration Projects Completed
Kanutchan Creek-Little Butte Creek	Major blowdown, 83 ac., 2008		Decommissioned 2.2 miles of road. Rehabbed approximately 3 acres of meadows damaged by off highway vehicles (OHVs).

TABLE 2-50

Changes in Watershed Condition Since Publication of the Little Butte Creek Watershed Assessment

Subwatershed	**Fires or Other Terrestrial Disturbance Events**	**Flood or Channel Forming Events**	**Recommended Watershed Assessment Restoration Projects Completed**
Lick Creek	Major blowdown, 886 ac., 2008; Doubleday Fire, 316 ac., 2008		Decommissioned 1.3 miles of road. Replaced two undersized culverts on Lick Creek with one properly sized bottomless structure for fish passage. Rehabbed approximately 7.3 acres of meadow damaged by OHVs.
Salt Creek	2008 blowdown event		Decommissioned/closed 2.8 miles of road.
Lower South Fork Little Butte Creek	2002 Lost Lake Fire, 230 acres; 2008 blowdown event	1997: Flood event in 5+ steep headwater tributaries; blew out lots of large wood, scoured riparian areas, sluiced out several miles of channels, deposited uprooted trees and tons of sediment on flat benches, road crossings, etc., changed channels, wiped out bridges and culverts, extensive erosion of roads 2005 and 2011: floods/debris torrents	• two large wood projects (Soda and Lost Creek) • four road obliteration projects - 1.5 miles • riparian planting
Lower North Fork Little Butte Creek	2005 Wasson Canyon Fire, 1507 acres, some salvage; 2008 blowdown event		Decommissioned/closed 2.8 miles of road.
Middle South Fork Little Butte Creek	2011 Little Butte Fire, 276 acres; 2008 blowdown event		
Upper North Fork Little Butte Creek	2005 Jack Springs Fire, 7 acres; 2008 blowdown event		
Upper South Fork Little Butte Creek	2008 blowdown event		
Beaver Dam Creek	2008 blowdown event		

Current Watershed Conditions

Although watershed restoration projects have improved local and subwatershed conditions where the projects have been completed, the issues described in the watershed assessment remain at the watershed scale. Large amounts of water are diverted from Little Butte Creek for irrigation and other water supply needs. Canal systems deliver the water to nearby Howard Prairie Lake and the Klamath River watershed, Agate Lake, and the Rogue Valley. Rural development has exacerbated sediment and water quality issues.

Despite being moderately polluted, Little Butte Creek is one of the best salmon-producing tributaries of the Rogue River. Coho and Chinook salmon migrate upstream each year; however, several dams hinder their progress. A fish ladder was built in 2005 to help fish swim past a dam constructed at Eagle Point in the 1880s. The fish ladder was destroyed by flooding just three months after construction but was rebuilt in 2008. Restoration of a 1.3-mile (2.1-kilometer) artificially straightened section of the creek in the Denman Wildlife Area was completed in 2011. The most severe barriers to anadromous fish passage are located on private lands, either on the mainstem of Little Butte Creek or South Fork Little Butte Creek. Steelhead and coho are the species most impacted by the barriers that have been surveyed so far (table 2-51). Summer steelhead are particularly impacted as they have the most extensive distribution in the Little Butte Creek watershed. Coho are affected only by those barriers lower in the tributaries (LBWC 2003). South Fork Little Butte Creek is one of the primary rearing areas and contains one of the largest populations of rearing coho salmon in the upper Rogue River Basin. Resident fish include cutthroat, rainbow, and brook trout.

TABLE 2-51

Anadromous Fish Distribution in Little Butte Creek Subwatersheds Crossed by the Project (miles)

	Little Butte Cr.	**South Fork Little Butte Cr.**	**North Fork Little Butte Cr.**	**Antelope Cr.**	**Lake Cr.**	**Lick Cr.**	**Dead Indian Cr.**	**Soda Cr.**	**Total**
Fall Chinook	17								
Spring Chinook	17	1							18
Coho	17	16.4	7.5	6.3	2.5	2.25	0.5	0.25	52.7
Winter Steelhead	17	16.4	10						43.4
Summer Steelhead	17	16.4	10	13	3.1	3	0.9	2.6	66

Source: Little Butte Creek watershed assessment, Little Butte Creek Watershed Council, 2003, p. 67

NWFP aquatic and riparian monitoring data are shown in table 2-52. Only the Lower North Fork and Lick Creek subwatersheds showed declining trends; both were caused by declining trends in vegetation.

TABLE 2-52

NWFP Aquatic and Riparian Monitoring Trends, Subwatersheds in Little Butte Creek

Subwatershed a/	**Watershed Condition 1994**	**Watershed Condition 2009**	**Watershed Condition Trend b/**
Upper North Fork Little Butte Creek	0.0870	0.1400	0.0530
Lower North Fork Little Butte Creek	-0.3360	-0.3460	-0.0100
Upper South Fork Little Butte Creek	0.1000	0.2310	0.1310
Beaver Dam Creek	0.0690	0.0970	0.0280
South Fork Little Butte Creek/Dead India	-0.0480	-0.0130	0.0350
Lower South Fork Little Butte Creek	-0.3410	-0.3320	0.0090
Salt Creek/Long Branch	-0.4980	-0.4810	0.0170
Little Butte/Lick	0.0130	-0.0080	-0.0210

a/ Data Source: Northwest Forest Plan AREMP monitoring program. See Attachments: section 3.3.2 of this appendix.
b/ Positive numbers indicate improving watershed conditions. Negative numbers indicate declining conditions.

Natural Disturbance Processes

Disturbance processes for the Little Butte Creek watershed are consistent with those described for the Klamath-Siskiyou Province on the western half of the watershed (generally BLM lands) and the High Cascades on the eastern half of the watershed (generally NFS lands). Fires were (and are) the dominant disturbing force on the landscape (table 2-50). Fire effects were highly variable because of the diversity of the landscape.

Currently much of the lower elevation areas have dense shrubs, hardwoods, and conifer forests due to decades of fire exclusion. Previously open grass/oak/pine savannas or Douglas-fir and other conifers historically dominated this landscape. Before effective fire suppression, fires burned with lower intensity and were widespread.

Moderate severity regimes dominated transition zones between lower valleys and the cool, moist uplands of the Dead Indian Plateau. Fires were more infrequent (25 to 100 years) and burned with varying degrees of intensity. High-intensity, stand-replacing fires occasionally occurred in this zone. A complicated mosaic of vegetation was the overall effect of fire on the landscape.

The high-severity regime found at upper elevations is characterized by moist and cool conditions, resulting in infrequent fires. Fires within these areas are due to unusual conditions such as drought or low precipitation periods associated with high winds, and fires historically resulted in stand replacement. Fire return intervals for the Mixed Conifer and drier portions of the White Fir zone areas of the Dead Indian Plateau range from 8 to 125 years, with an average of about 35 years. Fire ignitions that occurred did not spread to the same degree as ignitions with similar vegetation on steep slopes because of the gentle slopes of the plateau (BLM and Forest Service: 34).

Fire return intervals within the Shasta Fir and Mountain Hemlock vegetation zones in the High Cascades are much longer than within similar zones in the Klamath Mountain Range (Atzet et al. 1982, cited in BLM and Forest Service 1997). Fire return intervals of 100 to 300 years were not uncommon because of the higher precipitation amounts in the Cascades Range compared to the extreme eastern Siskiyou Mountains of the Klamath-Siskiyou Province. In the lava fields, fires historically occurred from lightning, resulting in burned islands of trees. The Brown Mountain area has exposed lava fields with little or no ground fuels. Field observations in the lava fields have shown that many of the large Douglas-fir and ponderosa pine have old fire scars.

There is often substantial erosion within 2 years after a high-intensity fire consumes duff layers and a significant rainfall event occurs (Robichaud et al. 2000). Soils are protected from further rainfall impact when duff layers are not removed or where vegetative cover or litterfall is reestablished within a year after a disturbance. There can be a significant amount of surface erosion and mass wasting on exposed soils when intense rainstorm events occur shortly after fire disturbance. Topsoil loss has probably been reduced over the past 70 years since fire suppression has resulted in fewer natural fires exposing soils. However, this situation increases the risk that a hot-burning wildfire would occur that could cause increased soil erosion and landslide events. Large lightning-caused wildfires periodically swept across the Little Butte Creek watershed, mainly in the lava plateau and canyon sideslopes during the late nineteenth and early twentieth centuries. The middle elevations of the watershed contain the highest fire occurrence and intensity in the watershed and are considered to be high-risk wildfire areas. The canyon sideslope landscape is located in the unstable and highly erodible terrain of South Fork and Dead Indian canyons (BLM and Forest Service 1997).

Thick snowpacks in the TSZ that are rapidly melted by warm rainstorms are the primary natural event that affects water quality and fisheries. Several earthflows and debris flows reactivated mainly in the canyon sideslopes landform during the 1955, 1964, 1974, and 1997 rain-on-snow events. Several new landslides also occurred in the steep canyon sideslopes terrain. These storms, especially the 1964 and 1997 events, caused both natural and management-related slides to transport sediment to nearby streams (BLM and Forest Service 1997: 58). Where rain-on-snow events occur within a few years after a high-intensity fire, there can be a synergistic effect from the lack of vegetation on the forest floor, increased snowpack in the opening created by the fire, lack of interception from the canopy, and rapid melting of snowpack. When this overlapping of disturbance events occurs, significant mass-movement and erosion activity may occur.

Project Effects and Natural Range of Variability

The Little Butte Creek watershed is an active landscape with respect to erosional processes. Conditions in the Little Butte Creek watershed are highly variable and have been substantially altered by past management practices such as timber harvest and fire exclusion, private land development, and irrigation withdrawals. The Little Butte Creek watershed assessment described current and reference conditions for aquatic processes and functions and discussed ecological trends, but it did not establish metrics that reflect the natural variability at the watershed scale.

There are two central concerns in the Little Butte Creek watershed based on the Little Butte Creek watershed assessment:

1: Whether the clearing for the project would cause excessive erosion and sediment deposition that would adversely impact any of the affected streams. Sediment levels throughout the Little Butte Creek system are limiting and excess or chronic sediment deposition to streams is a significant cause for concern.

GeoEngineers completed a stream crossing turbidity, construction risk, and site response analysis (see section 1.3). Evaluations for stream channel crossings in the Little Butte Creek watershed are summarized in table 2-49. BMPs that would be applied at each crossing, grouped by “blue” (low risk) and “yellow” (moderate risk) turbidity and risk ratings are shown in table 2-53.

- The crossing at MP 166.21 (Daley Creek) is an intermittent stream with a low-risk crossing. BMPs from the “blue” category in table 2-53 would be applied at this crossing.

- The crossing at MP 162.45 (Upper South Fork Little Butte Creek subwatershed) was rated as having a moderate risk for construction impacts and site response where “yellow” BMPs would be applied. The “yellow” BMP group includes additional measures for bank and stream bottom stabilization as needed, including grading or terracing over steepened banks; and use of geotextile fabrics, fiber rolls, rock and rip-rap placement, instream structures, stratified backfill, structural fill placement, and LWD placement (table 2-53).

- The crossing at MP 167.67 is a perennial stream. The project right-of-way would bore underneath the stream from either side of the Riparian Reserves, which would result in no cleared or modified Riparian Reserves associated with this perennial stream. For this reason, the stream crossing was rated as a low-risk crossing. BMPs from the “blue” category in table 2-53 would be applied at this crossing.

In all crossing groups,

- Silt fencing would be installed and maintained until effective ground cover is reestablished.
- Effective ground cover would be in place prior to the onset of seasonal precipitation (table 2-14).
- Rapid reestablishment of vegetation would be emphasized.

These are all proven and effective erosion control and water quality BMPs, and based on site-specific evaluations and field reviews (GeoEngineers 2011; Koler 2013), these are expected to be effective. If these BMPs are applied, sediment impacts are expected to be minor, short-term, and consistent with the evaluation in section 1.3.1. Long-term adverse consequences on water quality from soil erosion are not expected to occur due to the establishment of effective ground cover, revegetation of disturbed areas, installation of waterbars to disperse water, regrading over-steepened slopes, and the relative lack of corridor intersects with aquatic systems.

2: Whether removal of effective shade may increase water temperatures in streams.

Restoring stream crossings reconnects aquatic habitats by allowing the passage of aquatic biota and restoring riparian vegetation. Over time, these actions reduce sediment and restore shade. Restoration of these crossings includes riparian planting as a mitigation that will help offset the impact of shade removal at pipeline right-of-way crossings.

There are three stream crossings on NFS lands in the Little Butte Creek watershed where Riparian Reserve vegetation would be cleared. One crossing is an intermittent channel, and two crossings are on perennial streams. One of the perennial stream crossings (MP 167.67) would be constructed with a method that would bore underneath the perennial stream from either side of the Riparian Reserves. This method would have a limited impact on Riparian Reserves associated with this perennial stream and would not result in cleared or modified Riparian Reserves. In addition, two Riparian Reserves are clipped, one associated with an intermittent stream and one with a wetland. The intermittent stream crossing is not expected to affect water temperatures because the stream would likely be dry or become discontinuous by the time that warmer water temperatures become an issue in late summer. A site-specific temperature evaluation of the perennial crossing at the South Fork Little Butte Creek (spring-fed creek) at MP 162.45 showed no change in water temperature (NSR 2009; see section 1.3.1.3).

Pacific Connector used predictive modeling on a representative cross-section of crossings along the Pacific Connector route, spanning the ecoregions, HUCs, width classes, and aspect classes from Coos Bay to Malin, Oregon, including stream crossings on NFS lands. Model results show a maximum predicted increase of 0.16°C over one 75-foot clearing. Thermal recovery analysis shows that temperatures return to ambient within a maximum distance of 25 feet downstream of the project right-of-way, based on removal of existing riparian vegetation over a cleared right-of-way width of 75 feet. These findings are consistent with NSR 2009. Pacific Connector also assessed the cumulative impact of right-of-way clearing on stream temperatures. The cumulative effects of the proposed project on the thermal regime in the Coos, Coquille, South Umpqua, Rogue, Klamath, and Lost River basins is expected to be exceptionally minor and well below detection in the field, given that mitigation for effective shade loss would occur and that predictive modeling with SSTEMP shows local impacts are small in magnitude and spatially limited (GeoEngineers 2013f: 26). No discernable effect on stream temperatures would be expected based on these evaluations.

TABLE 2-53

Pacific Connector Proposed BMPs for Use at Waterbody Crossings[33]

	Best Management Practices for Project Typical "Blue" Crossings and for All Other Crossings.	**Best Management Practices for Moderate Risk "Yellow" Crossings**	**Best Management Practices for High Habitat Risk "Green" Crossings**
Crossing MP	**166.21**	**162.48**	None
Streambed	• Dry ditch crossings (5) • Backfill to match existing streambed gradation, composition as much as possible • Profile restored to existing profile and grade • Stratified backfill for fish-bearing streams	• Dry ditch crossings (5) • Backfill with native material (3, 4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1) • Structural fill placement (2)	• Dry ditch crossings (5) • Backfill with native material (3, 4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1)
Streambanks	• Revegetation with native plant materials (3, 4, 6) • Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment • Widened riparian corridor (federal lands, willing landowners) (3, 6) • Use of fast-growing native tree species to accelerate shading) • Placement of large wood and boulders where appropriate • Maintenance of effective cover	• Typical erosion and sediment control BMPs including erosion control blankets, silt fences, etc. • Narrowed construction disturbance (75 feet) corridor where feasible (2, 3, 4) • Narrowed permanent management corridor (2, 3, 4) • Revegetation with native plant materials (3, 4, 6) • Bank graded/terraced to 3:1 (2, 3) • Geotextile reinforced slope (5) • Fiber rolls (3) • Stream barbs/flow deflectors (5) • Toe rock placement (3) • Riprap placement (3) • Biotechnical "vegetation" riprap (3) • Tree revetments (3) • Anchor banks with LWD and boulders (7)	• Typical erosion and sediment control BMPs including erosion control blankets, silt fences, etc. • Narrowed construction disturbance (75 feet) corridor where feasible (2, 3, 4) • Narrowed permanent management corridor (2, 3, 4) • Revegetation with native plant materials (3, 4, 6) **Additional Measures** • Rootwad enhancement of bank stabilization
Riparian Vegetation	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (federal lands (3, 6) • Use of fast growing native tree species to accelerate shading (3)	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (federal lands) (3, 6) • Use of fast-growing native tree species to accelerate shading (3)	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees for willing landowners (3) • Widened riparian corridor (federal lands, willing landowners) (3, 6) • Use of fast-growing native tree species to accelerate shading (3) **Additional Measures** • Emphasis on prevention and monitoring for invasive weeds and weed control during revegetation establishment.

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[33] The bore under the perennial stream at MP 167.67 would only require surface disturbance outside of the Riparian Reserve in an upland environment. Standard BMPs for this type of landscape would be incorporated consistent with the POD.

TABLE 2-53

Pacific Connector Proposed BMPs for Use at Waterbody Crossings[33]

	Best Management Practices for Project Typical “Blue” Crossings and for All Other Crossings.	**Best Management Practices for Moderate Risk “Yellow” Crossings**	**Best Management Practices for High Habitat Risk “Green” Crossings**
Aquatic Habitat	• Stratified backfill for fish-bearing streams (1, 2, 4, 6) • Placement of large wood where appropriate (2, 4, 6)	• Stratified backfill for fish-bearing streams (1, 2, 4, 6) • Placement of large wood where appropriate (2, 4, 6)	• Stratified backfill for fish-bearing streams (1, 2, 4, 6) • Placement of large wood where appropriate (2, 4, 6) **Additional Measures** • Rootwad enhancement of bank stabilization
BMP Source	1. FERC Guidelines 2. FEIS chapter 2, Project Description 3. POD attachment, ECRP 4. POD attachment Wetland and Waterbody Crossing 5. POD attachment, ECRP 6. POD attachment Compensatory Mitigation Plan 7. Site Specific Crossing Prescriptions - Perennial Streams on NFS Lands (NSR 2014) Representatives of the Forest Service may require additional measures necessary to meet agency standards under the terms of the Right-of-Way Grant.		

Table 2-54 compares project effects to the historic range of variability for erosional processes, ecological succession and vegetative condition, flow regimes, stream temperature, and aquatic habitat complexity.

TABLE 2-54

Project Effects and Relevant Ecological Processes Described in the Little Butte Creek Fifth-Field Watershed Assessment

Ecological Processes Relevant to the Project	**Historic Range of Variability**	**Pacific Connector Effects**
Erosional Processes	The primary natural event that affects water quality and fisheries is thick snowpacks in the TSZ that are rapidly melted by warm rainstorms. During the 1955, 1964, 1974, and 1997 rain-on-snow events, several earthflows and debris flows reactivated, mainly in the canyon sideslopes landform. Several new slides also occurred in the steep canyon sideslopes terrain. These storms, especially the 1964 and 1997 events, caused both natural and management related slides to transport sediment to nearby streams (BLM and Forest Service 1997, p. 58). The lower elevation Klamath-Siskiyou Province portion of the watershed is driven more by winter rainfall, streambank erosion, and occasional rain-on-snow events at mid elevations. Where high-intensity rainfall events overlapped recent fire events, surface erosion and landslide activity could increase dramatically. Infiltration rates are relatively lower, and, hence, surface erosion rates are relatively higher when compared to the pumice-dominated High Cascades Province. Surface erosion potential for disturbed soils is high. Reestablishment of effective ground cover significantly reduces surface erosion rates (BLM and Forest Service 1997, p 59). Fire return intervals range from 1 to 25 years in the lower elevation interior valleys and lower elevation forests and from 25 to 100 years in lower	On NFS lands (generally High Cascades Province) the project is located on ridge tops or on the flat pumice-dominated Dead Indian Plateau. The project does not cross steep canyon sideslope landforms that are prone to landslides. No unstable earthflow terrains are crossed (GeoEngineers, 2009). Application of BMPs described in the Stream Crossing Risk Assessment (GeoEngineers 2013), including maintenance of effective ground cover and revegetation according to the ECRP, are expected to minimize sediment transport to streams. Stream channel crossings are widely separated and unlikely to aggregate sediment downstream. Sediment produced by the project during construction using dam-and-pump construction methods is expected to be minor and short-term (see section 1.3.2). Given the fire history of the area, and erosional processes, these effects are well within the range of natural variability for the Little Butte Creek watershed.

TABLE 2-54

Project Effects and Relevant Ecological Processes Described in the Little Butte Creek Fifth-Field Watershed Assessment

Ecological Processes Relevant to the Project	Historic Range of Variability	Pacific Connector Effects
	elevation mixed-conifer forests (BLM and Forest Service 1997, p. 34). Erosional processes in the upper elevation High Cascades portion of the Little Butte Creek watershed (Forest Service) are driven by snowmelt and occasional rain-on-snow events. Pumice soils have high infiltration rates, but steeper slopes can be prone to landslides when saturated from snow melt. Summer thunderstorms are not unusual in Little Butte Creek watershed and can deliver intense but localized rain events. These events can result in pulses of sediment, particularly if associated with recent fires.	
Ecological Succession/ Vegetative Condition	The Little Butte Creek watershed is very diverse, ranging from interior valley plant communities dominated by agriculture, grassland, and oak woodlands to high-elevation alpine forests. In the lower elevation Klamath-Siskiyou Province, higher frequency, low- to moderate-intensity fires created a mosaic of vegetation types with occasional stand-replacing fires during droughts. At higher elevations, fire frequency decreased and intensity increased, resulting in more stand-replacement type events. On the Dead Indian Plateau, gentler slopes limited the spread of stand-replacing fires when compared to steeper slopes. Fire suppression and timber management have reduced and fragmented late successional stands, reducing patch size, shifting species dominance to white fir, and increasing early- and mid-seral proportions of the drainage. LSOG acres in both upland and riparian areas are below historic averages. Vegetative condition throughout the Little Butte Creek watershed has been significantly altered by timber management activities.	The project would clear 209.32 acres and modify 71.4 acres of NFS land, which accounts for 0.47% of the NFS in the Little Butte Creek watershed. Approximately 7.66 acres of Riparian Reserve vegetation would be cleared on NFS lands. This is 0.09% of the Riparian Reserves on NFS lands in the watershed. Of this, approximately 3.70 acres are LSOG forest. The clearing of LSOG and mid-seral vegetation result in long-term changes in vegetative condition. Given the fire history (see section 2.5.5.2, Changes in Watershed Condition) of the watershed, this is well within the range of natural variability for the Little Butte Creek watershed.
Flow Regime	Prior to the introduction of irrigation in the Little Butte Creek watershed, summer stream flows were directly related to the amount and timing of precipitation events. Years of high rainfall and large spring snowpacks resulted in summer flows that provided adequate water supplies for aquatic dependent species. Drought years produced low flows and there likely were some dry stream channels by the end of summer. Irrigation withdrawals that began in the late 1800s and became more extensive in the early 1900s greatly reduced summer stream flow throughout the watershed. Historically, major flood events were generally the result of rain-on-snow events (BLM and Forest Service 1997, p. 147). The completion of Fish Lake dam in 1915 modified the winter streamflow regime in North Fork Little Butte Creek. Fish Lake stored the winter runoff and moderated the peak flows occurring downstream in North Fork Little Butte Creek. Irrigation withdrawals have significantly reduced summer flows, particularly in the lower part of the watershed. Extensive road building, timber harvest, and land clearing in Little Butte Creek watershed have raised	Large areas of vegetation removal in the TSZ and increased road networks/road densities within watersheds are known to increase peak-flows during rain-on-snow events. Most of the PCGP route in Little Butte Creek watershed is in the TSZ where rain-on-snow events occur. Analysis of vegetation patterns in the Little Butte Creek watershed assessment (p. 88) showed that the Little Butte Creek subwatersheds were all above the established recovery thresholds and were considered hydrologically recovered. This means that an increase in peak flows from vegetation change would have to be large enough to drop a subwatershed below recovery thresholds before a significant increase in peak flows is likely. The project crosses six different subwatersheds. The largest impact in any single subwatershed is in the Upper South Fork Little Butte Creek; approximately 1% of the subwatershed is affected by the project. There are two stream crossings in the Upper South Fork, so hydrologic connectivity with the project is very limited. One of the perennial stream crossings (MP 167.67) would be constructed using the bore method, and therefore no clearing or modification of the Riparian Reserve would occur at this location.

TABLE 2-54

Project Effects and Relevant Ecological Processes Described in the Little Butte Creek Fifth-Field Watershed Assessment

Ecological Processes Relevant to the Project	Historic Range of Variability	Pacific Connector Effects
	the potential for increasing the magnitude and frequency of peak flows in the tributaries and main stem. Openings in the TSZ are of particular concern as they tend to produce higher stream flows during rain-on-snow events (BLM and Forest Service 1997).	Given the limited extent of the project in any single subwatershed, the relative lack of hydrologic connectivity, and the hydrologically recovered vegetative condition of the watershed, it is highly improbable that the project would alter flow conditions or have an affect on flows. See also FEIS section 4.3.4.
Stream Temperature	Historically, stream temperatures were likely lower than today. Water quality in the Little Butte Creek watershed was probably very good prior to Euro-American settlement, with low summer water temperatures, acceptable chemical and biological parameters, and low sediment/turbidity levels. This was due to the wide, diverse riparian zones, low width/depth ratios, greater summer flows, and low sediment input. Land clearing activities in the late 1800s and early 1900s resulted in a reduction in riparian vegetation that allowed more solar radiation to reach streams. This likely resulted in increased water temperatures. Irrigation withdrawals during this same time period lowered stream flows and contributed to increased stream temperatures.	There are two stream crossings on NFS lands in the Little Butte Creek watershed where Riparian Reserves vegetation would be cleared. One crossing is on an intermittent channel, and one crossing is on a perennial stream. The intermittent stream crossing is not expected to affect water temperatures because it is likely to be dry or become discontinuous by the time warmer water temperatures become an issue in late summer. A site-specific temperature evaluation of the perennial crossing at the South Fork Little Butte Creek at MP 162.45 showed no change in water temperature (NSR 2009). (See section 1.3.1.3 of this document and FEIS chapter 4.4). Based on this evaluation, no discernable effect on stream temperatures would be expected.
Aquatic Habitat Stream Channel Complexity	Beaver dams and natural geomorphic processes created complex, sinuous channels with low width-to-depth ratios and high pool frequencies. Sediment inputs were dominated by pulses of landslide deposits associated with floods from peak flow events (Everest and Reeves, 2007). The loss of beaver dams due to fur trapping in the 1830s to 1840s resulted in scouring of channel beds and banks, reduction in the number of stream reaches with multiple channels, increased width/depth ratios, and increased fine sediment deposition in pools. Channelization resulted in entrenched channels with greater width/depth ratios. Decreases in sinuosity accompanied by increased stream gradients and reduced bedload transport capability were a consequence of the larger width/depth ratios (BLM and Forest Service 1997).	During construction, the project would alter the beds and banks of stream channels and move LWD and boulders as necessary for construction. After construction, these sites would be restored to their preconstruction condition and stabilized as needed by placement of boulders, LWD, and erosion control structures, as specified in the ECRP and Wetland and Waterbody Plan. Therefore, no long term effects to aquatic habitat and channel complexity are expected. Effects would be limited to the project scale and would be minor and short-term (typically 1 to 5 days per crossing). Additionally, 1.5 miles of LWD instream projects are a part of the mitigation plan (see section 2.5.5.6).

Compliance with Rogue River National Forest Land and Resource Management Plan

Table 2-55 describes Rogue River–Siskiyou National Forest LRMP Standards and Guidelines relevant to the ACS and project compliance with this management direction in the Little Butte Creek watershed.

TABLE 2-55

Compliance with Rogue River National Forest LRMP Standards and Guidelines in the Little Butte Creek Watershed

LRMP Standard and Guideline	**Project Compliance**
LH-4: Issuing leases, permits, right-of-way and easements.	Terms and conditions to ensure compliance with ACS objectives have been incorporated into the BLM Right-of-Way Grant in the form of 28 exhibits to the POD. These plans include the Wetland and Waterbody Crossing Plan, the Erosion Control and Revegetation Plan, the Hydrostatic Test Plan, the right-of-way Clearing Plan, the TMP, and others.
RA-4: Locating water withdrawal sites.	Pacific Connector has developed a Hydrostatic Test Plan (see the POD) that would minimize any potential short-term effects on stream flows from water discharge events from the project's hydrostatic testing operations. No potential hydrostatic test water sources under Forest Service or BLM jurisdiction occur within the Little Butte Creek watershed; therefore, the biological, physical, and chemical integrity of these systems would remain unaffected by hydrostatic withdrawal activities.
RF-2: Road Construction Standards and Guidelines.	The existing transportation system in the Little Butte Creek watershed would be adequate for construction of the project. No new temporary or permanent access roads are planned in the Little Butte Creek watershed.
RF-4: New culverts, bridges and other stream crossings.	No new road crossings of streams are proposed in the watershed. Crossings would be maintained to prevent diversions. See TMP specifications; TMP section 2.2.3; and TMP Exhibit F, section F.9.e, which require culvert and bridge replacements to meet agency standards and agency approval of plans.
RF-5: Minimizing sediment delivery from roads.	Road maintenance specifications T-831, T-842, T-811, and T-834, which are designed to minimize sediment delivery to aquatic habitats, would be implemented during project construction. Several road improvement projects and road decommissioning are proposed in the Little Butte Creek watershed. These are expected to reduce sediment delivery from roads, in some places significantly.
RF-6: Maintaining fish passage.	Fish passage would be maintained at all road crossings where project-related road repairs are implemented.
RF-7: Transportation Management Plan development.	The TMP meets all of the requirements of RF-7.
WR-3: Proper use of planned mitigation and restoration.	Application of BMPs and aggressive erosion control measures, restricted construction windows, and numerous other impact minimization measures have been incorporated into the POD to prevent habitat degradation. These measures are not being used as a substitute for otherwise preventable habitat degradation or as surrogates for habitat protection.
Management direction for Survey and Manage Species in the NWFP ROD was replaced by the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines as Modified by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.)	The project affects Survey and Manage species within the Little Butte Creek watershed. Such effects are inconsistent with LRMP direction. Regardless, the project does not threaten the persistence of any Survey and Manage species (see appendix F.5). Waiving application of Management Recommendations for Survey and Manage species in the watershed would not prevent attainment of any ACS objective.

TABLE 2-55

Compliance with Rogue River National Forest LRMP Standards and Guidelines in the Little Butte Creek Watershed

LRMP Standard and Guideline	Project Compliance
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth-field watersheds (20 to 200 square miles) in which federal forest lands are currently composed of 15% or less late-successional forest. (The assessment of 15% will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands. Protection of these stands could be modified in the future when other portions of the watershed have recovered to the point where they could replace the ecological roles of these stands.	Federal lands in the Little Butte Creek watershed are currently 24% LSOG and exceed this threshold.
Standards and Guidelines for Facilities in Restricted Riparian (MA 26) areas: Helispots and transmission corridors should be located outside this management area. (Rogue River–Siskiyou National Forest LRMP 4-308)	MA 26, Restricted Riparian, does not allow utility corridors to cross this land allocation. The project right-of-way crosses a part of the Restricted Riparian Land Allocation at the South Fork Little Butte Creek. A forest plan amendment is necessary. Amendment RRNF-5 allows the project to cross approximately 3.63 acres of the Restricted Riparian land allocation.
Standards and Guidelines in the Rogue River–Siskiyou National Forest Land and Resource Management Plan (Rogue River–Siskiyou National Forest LRMP 4-41, 4-83, 4-97, 4-123, 4-177, 4-307).	No more than 10% of an activity area should be compacted, puddled, or displaced upon completion of a project (not including permanent roads or landings). No more than 20% of the area should be displaced or compacted under circumstances resulting from previous management practices, including roads and landings. Permanent recreation facilities or other permanent facilities are exempt. The project cannot meet this standard, and a project-specific amendment of the Rogue River–Siskiyou National Forest LRMP is necessary. RRNF-6 allows the project to exceed restrictions on detrimental soil conditions from displacement and compaction within the project right-of-way on an estimated 60 acres.

Compliance with Standards and Guidelines for Key Watersheds

The Little Butte Creek watershed above the confluence of the North and South Forks was designated a Tier 1 Key Watershed in the NWFP. Applicable Standards and Guidelines for Key Watersheds and project consistency are shown in table 2-56.

TABLE 2-56

Standards and Guidelines for Key Watersheds

Standard and Guideline	Project Consistency	Mitigation Plan
Reduce existing system and nonsystem road mileage, with no net increase in road miles	No new roads would be constructed by the project. The construction corridor would be obliterated after construction.	Decommissioning of 57.5 miles of road on NFS lands would result in a net decrease of road miles and reduce road density in the Tier 1 Key Watershed.
No new roads would be constructed in inventoried Roadless Areas.	No part of the project is in an inventoried Roadless Area.	None
Watershed Analysis/Assessment must be completed prior to management activities.	Watershed Analysis/Assessment has been completed for all watersheds crossed by the project on NFS lands.	Off-site mitigation measures are consistent with watershed assessment recommendations.

Relationship of Proposed Rogue River–Siskiyou National Forest LRMP Amendments to the ACS

The Rogue River–Siskiyou National Forest LRMP contains Standards and Guidelines that cannot be met by the project. Two of these Standards and Guidelines have a nexus with the ACS in that they provide protection for aquatic resources that are more restrictive than the NWFP. Site-specific amendments to these Standards and Guidelines are proposed to make provision for the project. This discussion addresses whether those plan amendments would prevent attainment of the ACS objectives.

RRNF-5. Amends Management Area (MA) 26 (Restricted Riparian)

A Standard and Guideline in the Rogue River–Siskiyou National Forest LRMP prohibits development of energy transmission facilities in the Restricted Riparian land allocation. The purpose of this Standard and Guideline is to protect unique riparian habitats associated with perennial streams for wildlife, fishery, and other beneficial uses and to protect perennial streams from detrimental changes in water temperature, blockages of water courses, and deposits of sediment. The Restricted Riparian land allocation occurs on all lakes, perennial streams, and wetlands within 100 feet of the riparian feature or to the extent of associated riparian vegetation. The project right-of-way crosses two perennial streams, the South Fork Little Butte Creek and unnamed stream, and one wetland associated with Daley Creek, an intermittent stream. The stream crossing of the South Fork Little Butte Creek occurs at MP 162.45 in the Upper South Fork Little Butte Creek subwatershed and affects approximately 2.36 acres of riparian habitat. The unnamed perennial stream crossing occurs at MP 167.67 in the Upper South Fork Little Butte Creek subwatershed; a bore would be used to cross this feature and no riparian habitat would be disturbed. The crossing of the wetland associated with intermittent Daley Creek occurs at MP 166 in the Beaver Dam Creek subwatershed and clears approximately 0.9 acre of riparian habitat.

Possible environmental consequences associated with LRMP amendment of MA 26 to allow crossing of Restricted Riparian zones include the following.

Stream Temperature: One perennial stream, the South Fork Little Butte Creek at MP 162.45, is crossed by the project right-of-way where riparian vegetation would be removed. Oregon State water quality standards (Oregon Administrative Rules (OAR) 340-041-0028) state that all nonpoint sources taken together at the point of maximum impact may not exceed 0.3 ºC (0.5 ºF). The Rogue Basin TMDL (2006) allocates the human use allowance to be a 0.3 ºC increase at the point of maximum impact (i.e., downstream of tributaries impacted by pipeline construction). In addition, all of the stream crossings in the Little Butte Creek watershed are designated as Core Cold Water habitat (OAR 340-041, figure 271A). OAR (340-041-0028) states that streams designated with a fish use of Core Cold Water habitat may not exceed 16.0 ºC (60.8 ºF) as measured by the 7-day-average maximum stream temperature.

At the request of the Forest Service, NSR conducted a site-specific evaluation of impacts of shade removal on water temperature at the proposed crossing of the project right-of-way at the South Fork Little Butte Creek (NSR 2009). This analysis concluded the project crossing on the South Fork Little Butte Creek was not likely to increase water temperature. Daley Creek is an intermittent stream and is dry during warm summer months most years, so water temperature at the Daley Creek crossing is not likely to be affected by the project.

Pacific Connector used predictive modeling on a representative cross-section of crossings along the project alignment, spanning the ecoregions, HUCs, width classes, and aspect classes present from Coos Bay to Malin, Oregon, including stream crossings on NFS lands. Model results show a maximum predicted increase of 0.16°C over one 75-foot clearing. Thermal recovery analysis shows that temperatures return to ambient within a maximum distance of 25 feet downstream of the project right-of-way, based on removal of existing riparian vegetation over a cleared right-of-way width of 75-feet. These findings are consistent with NSR 2009. Pacific Connector also assessed the cumulative impact of right-of-way clearing on stream temperatures. The cumulative effects of the project on the thermal regime in the Coos, Coquille, South Umpqua, Rogue, Klamath, and Lost River basins is expected to be exceptionally minor and well below detection in the field, given that mitigation for the loss of effective shade would occur and that the predictive modeling of SSTEMP predicts that the local impacts are small in magnitude and spatially limited (GeoEngineers 2013f: 26).

Sediment: There is one stream crossing in the Rogue River–Siskiyou National Forest where sediment deposition is a potential issue. See table 2-53 for a description of crossing risk and associated BMPs for water quality. Pacific Connector's ECRP is consistent with BMPs designed to ensure that beneficial uses of water are protected from excessive sediment deposition. Erosion control measures include:

- Potential compaction on the project right-of-way is mitigated (e.g., scarification, subsoiling, ripping, Paraplow/wing-tipped ripper, etc.) and a roughened seedbed is created to minimize runoff and promote infiltration.

- Waterbars are installed at appropriate intervals based on slope gradient to divert runoff to stable areas and to minimize concentrated flows and potential erosion hazards.

- The project right-of-way is replanted with native grasses, trees, and shrubs (with the exception no trees within the 30-foot operational easement).

- Slash is redistributed across the project right-of-way to provide cover and long-term nutrient cycling.

- No maintenance roads would be established along the project right-of-way. Additionally, with the measures in the TMP, the project's use of the existing road system would improve the existing conditions because the applicant would be required to improve/maintain the existing road system.

- Compliance with the site-specific restoration plan prepared by Forest Service and submitted by the applicant for the South Fork Little Butte Creek crossing at MP 162.45.

Additional BMPs (table 2-53) that may be used on-site as needed include:

- Typical erosion and sediment control BMPs including erosion control blankets, silt fences, etc.
- Bank graded/terraced to 3:1
- Geotextile reinforced slope
- Fiber rolls
- Stream barbs/flow deflectors
- Toe rock placement
- Riprap placement
- Biotechnical “vegetation” riprap
- Tree revetments

Sediment effects are expected to be minor and short-term with dam-and-pump construction and application of BMPs as described in section 1.3.1.2 and would not prevent attainment of ACS objectives.

Blockages of Water: The South Fork Little Butte Creek at MP 162.45 would be crossed in the Little Butte Creek watershed. The project would not create any blockage of water (other than those short-term blockages that occur during construction with dam-and-pump) because the pipeline would be buried and constructed in such a manner that the stream bed and banks would be restored to original contours.

Protection of Riparian Habitat for Fish and Wildlife: Assuming that the extent of MA 26 matches the extent of the Riparian Reserve on South Fork Little Butte Creek, the project would clear a total of 3.26 acres of vegetation within MA 26, of which 1.24 acres is LSOG. The applicant-filed mitigation plan includes the following measures on NFS lands in the Little Butte Creek watershed:

- 4.3 miles of road decommissioning in riparian habitats. This would allow restoration of approximately 10.4 acres of riparian vegetation that is currently occupied by roads.

- Replanting of native riparian vegetation within 100 feet of waterbodies or the extent of riparian vegetation crossed on federal lands. This reestablishes riparian vegetation in the project right-of-way.

- Creation of 1,200 snags on 600 acres of NFS lands, of which approximately 126 acres are in Riparian Reserves. This replaces snags cut in association with the project right-of-way.

- Placement of LWD on 600 acres, of which an estimated 126 acres are in Riparian Reserves. This replaces LWD removed during construction of the project and contributes to riparian habitats.

- Placement of large wood in stream channels associated with stream crossings and on 1.5 miles of the South Fork Little Butte Creek.

- Replacement of shading in the project right-of-way.

- These measures restore components of riparian habitat on more acres of MA 26 than are affected by the project. The loss of 1.24 acres of LSOG vegetation in MA 26 at MP 162.45 is a long-term change in vegetative condition; however, given the fire history of the Little Butte Creek watershed (table 2-49), this degree of change is well within the range of natural variability for the watershed.

Based on this evaluation, it is unlikely that waiving the prohibition of utility corridors crossing MA 26 Restricted Riparian would prevent attainment of ACS objectives in the Little Butte Creek watershed.

RRNF-6. Site-Specific Amendment to Waive Limitations on Detrimental Soil Conditions within the Pacific Connector Right-of-Way in All Management Areas

Standards and Guidelines in the Rogue River–Siskiyou National Forest LRMP (Rogue River–Siskiyou National Forest LRMP 4-41, 4-83, 4-97, 4-123, 4-177, 4-307) states:

> No more than 10% of an activity area should be compacted, puddled or displaced upon completion of project (not including permanent roads or landings). No more than 20% of the area should be displaced or compacted under circumstances resulting from previous management practices including roads and landings. Permanent recreation facilities or other permanent facilities are exempt.

This Standard and Guideline was developed to limit an adverse impact to soils from timber sales and other developments so that the basic productivity of the land was maintained. Degraded soil conditions may occur in cleared project areas. On NFS lands in the Little Butte Creek watershed, approximately 75% (209.32 acres) of the project right-of-way would be cleared. Degraded soil conditions may result from displacement and compaction following completion of project construction and rehabilitation. Compaction can largely be addressed by subsoil ripping, but displacement would be unavoidable because of the nature of the project. Existing LRMP Standards and Guidelines allow up to 10% of the project right-of-way or 27 acres to result in a degraded soil condition on completion of a project. Thus, the proposed amendment allows an estimated additional 182 acres or 0.3% of the NFS lands in the Little Butte Creek watershed to be in a degraded soil condition on completion of the project.

Without mitigation, severe disturbances such as soil mixing or displacement would reduce long-term site productivity by displacing the duff layer and soil surface (A horizon), thus reducing the soil's ability to capture and retain water and nutrients. Sites with long-term detrimental soil conditions may have interrupted hydrologic function and poor site productivity. Compacted and/or displaced soils may increase runoff resulting in sediment erosion and may therefore have lower rates of vegetative recovery.

Environmental consequences associated with 182 acres of additional detrimental soil conditions above LRMP thresholds include:

- **A potential increase in sediment mobilization**. The following measures have been incorporated into the project design or mitigation plans to limit sediment erosion.
    - The project alignment was selected to avoid areas with high geologic hazards. No landslides have been identified that pose a threat to the project. The project does not cross unstable earthflow terrains identified in the Little Butte Creek watershed assessment.
    - Effective erosion control measures and BMPs are required, as shown in the ECRP (see section 1.3 for a discussion of erosion control measures). Additionally, the project would comply with LRMP Standards and Guidelines for maintenance of effective ground cover (see section 1.3.1.2).
    - Offsite mitigation measures that would help to offset these effects on NFS lands in the Little Butte Creek watershed include 57.51 miles of road decommissioning. Assuming a 14-foot average road width, 57.51 miles of proposed road decommissioning would reduce compaction and revegetate approximately 90 acres that are currently native road surfaces in the Little Butte Creek watershed. This substantially compensates for areas that may be in a detrimental soil condition (see section 2.5.4.7).
    - The Forest Service would require soil remediation, as needed, with organic materials in areas with potential revegetation difficulty within the project right-of-way.
    - Soil conditions from detrimental sediment impacts are expected to be minor and short term as the result of the linear nature of the project and its dispersal effects, ground cover maintenance, application of BMPs, ridge top location, few stream crossings, and application of offsite mitigation measures. The amendment of the LRMP is unlikely to exceed the soil disturbance thresholds on 145 acres.
- **A potential localized increase in peak flows:** Changes in peak flows may occur where there are large changes in vegetative condition in the TSZ within a watershed. The Forest Service concluded in the Little Butte Creek watershed assessment that peak flows in the headwater streams would decrease slightly as the area continued to recover hydrologically. Reduced harvest and restoration efforts under current land allocations would accelerate the recovery process. Roads would continue to affect peak flows. At the time of publication, the watershed assessment estimated conservatively that 72% of the vegetation in the South Fork Little Butte Creek in the TSZ was hydrologically recovered and that 75% of the vegetation in the TSZ throughout the basin was hydrologically recovered. This is above the threshold of 70% for increasing peak flows by removing vegetation in the timber types on the Dead Indian Plateau (BLM and Forest Service, 1997: 88). The project affects 1.02% of Upper South Fork Little Butte Creek subwatershed and 0.26% of the entire watershed when all ownerships are considered (table 2-46). Therefore, where changes in peak flows are likely, clearing associated with the project would not move either the South Fork Little Butte Creek or the subwatersheds of the Little Butte Creek watershed above the threshold. The FERC also concluded that the probability of project-caused increases in peak flows was minimal because of the small proportion of any single subwatershed that is affected by the project right-of-way. Additionally, there are two widely separated stream-corridor intersects that are miles apart. This limited hydrologic connectivity makes it highly

improbable that the project could affect peak flows, even in the most severe conditions (also see also FEIS section 4.4).

Amending the LRMP to allow detrimental soil conditions on 145 acres is unlikely to result in any change in flows that would prevent attainment of ACS objectives. This is due to limited hydrologic connectivity, the dispersed nature of impacts, the hydrologically recovered condition of the watershed, and limited project impacts.

- **A potential loss of site productivity, which may slow vegetative recovery**: Soils derived from High Cascades volcanic units on the Dead Indian Plateau may be low in productivity. Mechanically decompacting the soil to a minimum depth of 20 inches and reestablishing soil organic matter would be a critical first step in rehabilitating the soil toward a more natural condition. Soil rehabilitation would also require recovery of the soil biology, which requires restoration of the soil organic matter over time. Project mitigation measures would be used to decompact the project right-of-way, fertilize disturbed areas, reestablish native vegetation (i.e., limiting the area directly over the pipe to grasses and shrubs), and scatter slash and LWD back across the site to provide for long-term nutrient cycling as required in the ECRP. Additionally, the Forest Service would require soil remediation with additional organic material in any areas that are likely to have revegetation issues due to soil productivity. Any loss of soil productivity would be widely dispersed. Also, decommissioning 57.5 miles of roads (estimated to be 111 acres, assuming a 16-foot road base) on NFS lands would contribute to offsetting any loss of soil productivity.

  It is highly unlikely that reduced soil productivity would prevent attainment of the ACS objectives. The very limited area of detrimental soil conditions that may persist in Riparian Reserves due to the dispersed nature of this potential impact, soil remediation measures using woodchips, and on-site and off-site mitigation measures will reduce this likelihood.

Amendments RRNF-5 (MA 26 Restricted Riparian) and RRNF-6 (detrimental soil conditions) have minor effects at the site scale. It is highly unlikely that those effects would prevent attainment of ACS objectives.

Offsite Mitigation

Environmental Effects of Proposed Mitigation Actions

Offsite mitigation is intended to provide supplemental actions for projects that cannot be completely mitigated with on-site design features in order to ensure LRMP objectives are achieved. These projects also contribute to the “Maintain and Restore” objectives of the ACS. The Forest Service and Pacific Connector have entered into Agreements in Principle to accomplish off-site mitigation work in the Little Butte Creek watershed, as shown in tables 2-57 and 2-59. Mitigation measures were developed from the recommendations of watershed assessments, Late Successional Reserve Assessments, and the 2011 Northern Spotted Owl Recovery Plan. BLM-administered lands are not subject to ACS requirements as a result of the August 2016 RODs for two new RMPs (BLM 2016a and 2016b) that supersede the RMPs amended by the 1994 NWFP ROD. The project proponent has offered voluntary mitigation that could be implemented on BLM lands within this watershed; these mitigation efforts would benefit ACS objectives within the watershed. Forest Service and BLM mitigation measures proposed for this watershed were developed in conjunction with the project proponent from the recommendations in watershed assessments, LSR assessments, and the 2011 Northern Spotted Owl Recovery Plan. Proposed mitigation measures on NFS lands in the Little Butte Creek watershed with a nexus to the ACS include:

- **LWD Instream.** Placement of LWD in streams adds structural complexity to aquatic systems by creating pools and riffles and trapping fine sediments and can contribute to reductions in stream temperatures over time (Tippery, Jones et al. 2010). This is responsive to ACS objectives 2, 3, 4, and 5.
- **Road Decommissioning.** Decommissioning roads can substantially reduce sediment delivery to streams (Madej 2000, Keppeler et al. 2007). Proposed road decommissioning would increase infiltration, reduce surface runoff, and reduce sediment production from road-related surface erosion in the watershed where the impacts from the project occur. This mitigation is responsive to ACS objectives 2, 3, 4, and 5 and Standards and Guidelines for Key Watersheds (Forest Service and BLM 1994b: B-11, C-7).
- **Stream Crossing Repair.** Old culverts may block fish passage either because of poor design or because of failure over time. Removing these blockages and replacing them with fish-friendly designs can allow fish and other aquatic organisms to access previously unavailable habitat. This is responsive to ACS objectives 1, 2, 3, and 9 (Forest Service and BLM 1999b, Lanigan et al. 2012).
- **Fuels Reduction.** There will be direct impacts to the interior, affecting the interior habitat. The project will result in additional fragmentation and preclude the recovery of fragmented habitat for those stands adjacent to the pipeline corridor. Maintenance of the pipeline corridor will provide a continued vector for predators, early-seral species, and non-native species. The project will also result in a direct loss in biological services provided by mature forest characteristics for many decades past the life of this project. Both mature stands and developing stands will be removed during pipeline construction. Density management of forested stands will assist in the recovery of late-seral habitat, impacts from fragmentation, and a reduction in edge effects and will enhance resilience of mature stands. Accelerating the development of mature forest characteristics will shorten the impacts of the loss of those biological services due to pipeline construction. Thinning of young stands is a recognized treatment within LSRs if designed to accelerate development of late-successional habitat characteristics (NWFP ROD pages B-11 and C-12, ACS objectives C-11 and C-17).
- **Specialized Habitats.** The Little Butte Creek watershed provides habitat for species that are narrowly specialized. Restoration of these habitats is responsive to ACS objective 9.
    - **Mardon skipper butterflies.** The Dead Indian Plateau is one of the few places in the world where Mardon skipper butterflies are found. The project operational corridor that would be maintained in low-growing vegetation provides an opportunity to establish desired habitat for this species.
    - **Short-horned grasshoppers.** The project is adjacent to a known site for short-horned grasshoppers. This species is on the Region 6 Regional Forester's Sensitive Species

list. The pipeline requirement of a permanent open corridor provides a unique opportunity to develop habitat for this species.

Watershed Conditions and Related Mitigation measures on NFS Lands

The project crosses portions of the Lower North Fork, Upper North Fork, Lower South Fork, Middle South Fork, Upper South Fork, and Beaver Dam Creek subwatersheds on NFS lands in the Little Butte Creek watershed. All of the NFS lands in the Little Butte Creek watershed are classified as a Tier 1 Key Watershed. Standards and Guidelines for Tier 1 Key Watersheds overlay all other land allocations.

Mitigation measures concerning LSRs are included in this ACS assessment because the LSR network is also an important component of the ACS. The Standards and Guidelines under which LSRs are managed provide increased protection for all stream types. Because these reserves possess late-successional characteristics, they offer core areas of high-quality stream habitat that would act as refugia and centers from which degraded areas can be recolonized as they recover (i.e., Riparian Reserves). These reserves may be particularly important for endemic or locally distributed fish species and stocks (Forest Service and BLM 1994b: B-12). Standards and Guidelines for new developments in LSRs allow those developments provided that the impact is minimized and mitigated such that the impact is neutral to beneficial for the LSR in question.

Aquatic Conditions and Issues

Portions of the Little Butte Creek watershed have high road densities that have negatively affected watershed condition and wildlife habitat (BLM and Forest Service 1997). Key issues identified in the Little Butte Creek watershed assessment for aquatic habitats include temperature, habitat modification, and sedimentation. Riparian stands have decreased health and vigor, resulting in increased time to develop large tree structures for wildlife, stream shading, and future instream wood.

Placement of LWD in streams adds structural complexity to aquatic systems, traps fine sediments, and can contribute to reductions in stream temperatures over time (Tippery et al. 2010). Over the last century, many streams with high aquatic habitat potential have become simplified and therefore have a reduced capacity to provide quality habitat. Riparian stands have decreased health and vigor, resulting in an increase in the time needed to develop large tree structure for wildlife, stream shading, and future instream wood. Placement of LWD in streams adds structural complexity to aquatic systems, traps fine sediments, and can contribute to reductions in stream temperatures over time. The BLM recently completed the placement of LWS on 3 miles of Spencer Creek below this reach. Logs from the PCGP right-of-way will be used for the project. An estimated 75 pieces are needed. A helicopter will be used to place the logs.

Additional restoration recommendations to address these conditions include road decommissioning, riparian planting, and thinning (BLM and Forest Service 1997: Executive Summary, p. 10).

Terrestrial Conditions and Issues

The South Cascades Late Successional Reserve Assessment (1998) estimated that LSR 227 was approximately 16% LSOG habitat at the time of the assessment, but had the capacity to be 75%

late-seral (Forest Service et al.: 51, 113). In order to achieve that objective, the assessment recommended a number of stand-level activities to accelerate the development of late-successional stand conditions including young stand thinning, creation of snags, and recruitment of LWD (Forest Service 1998: 189-194). Opportunities also exist for management of unique habitats.

Table 2-57 describes mitigation measures on NFS lands that are intended to be responsive to these issues.

TABLE 2-57

Proposed Mitigation Measures on NFS Lands and BLM lands in the Little Butte Creek Watershed in the Rogue River National Forest

Agency	**Mitigation Group**	**Project Name**	**Project Rationale**	**Land Allocation**	**Quantity**
Forest Service	Aquatic and Riparian Habitat	SF Little Butte Creek LWD	Over the last century, many streams in the watershed with high aquatic habitat potential have become simplified and therefore have a reduced capacity to provide quality habitat. Riparian stands have decreased health and vigor, resulting in increased time needed to develop large tree structure for wildlife, stream shading, and future instream wood. Placement of LWD in streams adds structural complexity to aquatic systems, traps fine sediments, and can contribute to reductions in stream temperatures over time.	Riparian Reserve, LSR	1.5 Miles
	Aquatic and Riparian Habitat	Little Butte Creek Stream Crossing Decommissioning	Restoring stream crossings reconnects aquatic habitats by allowing the passage of aquatic biota and restoring riparian vegetation. Over time, these actions reduce sediment and restore shade. Restoration of these crossings includes riparian planting as a mitigation that would help offset the impact of shade removal at pipeline right-of-way crossings.	Riparian Reserve	32 Sites
BLM	Aquatic Habitat	Little Butte Cr. LWD	Little Butte Creek is a Tier 1 Key Watershed. Lost Creek provides habitat for coho salmon. Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by the Pacific Connector pipeline. Implementation of the PCGP project would result in the removal of shade from the Riparian Reserves associated with intermittent and perennial streams. The removal of vegetation within and adjacent to the channel will preclude future recruitment of LWD into the channel and associated Riparian Reserves. Placing shading at key locations within the channel and associated Riparian Reserves would offset both the short-term and long-term impacts from loss of LWD recruitment to Riparian Reserves and associated aquatic and riparian habitat and contributes to the accomplishment of ACS objectives.	Riparian Reserve	8.6 Miles
BLM	Fish Passage	Little Butte Creek Fish Screen	Irrigation diversions have negatively impacted fisheries in Little Butte Creek by causing entrapment. There is a private irrigation ditch with an unscreened diversion and associated push up dam on BLM land in the lower 1.5 miles of Lost Creek. The unscreened ditch is currently accessible to juvenile and adult fish, creating a stranding hazard with limited return access to the main channel. The push up dam is constructed at the beginning of the irrigation season and removed at the end of the season. This stream is considered coho critical habitat and building a push up dam in the creek each season disturbs gravels, generates sediment, and creates an unnecessary disturbance during steelhead spawning season. Creating a permanent diversion structure, possibly in the form of a boulder weir, would divert water without yearly maintenance and would provide for both upstream and downstream fish passage.	Riparian Reserve	1 site

TABLE 2-57

Proposed Mitigation Measures on NFS Lands and BLM lands in the Little Butte Creek Watershed in the Rogue River National Forest

Agency	Mitigation Group	Project Name	Project Rationale	Land Allocation	Quantity
Forest Service	Road sediment reduction	Little Butte Creek Road Decommissioning	A construction right-of-way 75- to 95-feet wide and additional work areas would be cleared. Of this, a 30-foot-wide corridor along the pipeline route would be maintained in early successional habitat. This strip of land in a forested ecosystem creates a barrier for movement of small animals between the remaining forest blocks and degrades neighboring habitat through edge effects and fragmentation. This is of special concern in riparian ecosystems where movement of wildlife species is concentrated. Decommissioning and planting selected roads in conjunction with precommercial thinning treatments (see other mitigation measures) would block up forested habitat and reduce edge effects and fragmentation in a period of about 40 years. Removal of culverts and roadbeds in riparian areas would reduce sedimentation to the waters. This mitigation meets ACS objectives 2, 4, 5, 8 and 9. Little Butte Creek watershed is a Tier 1 Key Watershed and road reduction is a major objective (NWFP ROD C-7). Note that this would be most effective if done in conjunction with the proposed thinning. This mitigation also offsets the impacts of soil compaction and displacement within the project right-of-way.	Riparian Reserve, LSR	57.5 Miles
BLM	Road Sediment Reduction	Little Butte Cr. Road Decommissioning Butte Falls RA	Little Butte Creek is a Tier 1 Key Watershed. Sediment has been identified by the Little Butte Creek Watershed Council as a limiting factor for aquatic habitat in Little Butte Creek. There are approximately 6 miles of the PCGP corridor and seven stream crossings on BLM lands in Little Butte Creek. The effects of the PCGP are similar to those of a road, including habitat fragmentation and potential impacts to flow and sediment regimes. Road decommissioning reduces habitat fragmentation, reduces road-related sediment, and improves hydrologic connectivity by reducing road density.	LSR	2.4 Miles
	Road Sediment Reduction	Little Butte Cr. Road Improvement	Little Butte Creek is a Tier 1 Key Watershed. Sediment has been identified by the Little Butte Creek Watershed Council as a limiting factor for aquatic habitat in Little Butte Creek. The PCGP has approximately 6 miles of corridor and seven stream crossings on BLM lands in the Little Butte Creek fifth-field watershed. The effects of the PCGP are similar to those of a road, including possible impacts to flow and sediment regimes. Improvement of existing roads restores hydrologic connectivity and reduces sediment by managing drainage and restoring surfacing where needed.	LSR	4.3 miles
	Road Sediment Reduction	Little Butte Cr. Road Resurfacing (Butte Falls Resource Area)	Little Butte Creek is a Tier 1 Key Watershed. The PCGP has approximately 6 miles of corridor and seven stream crossings on BLM lands in the Little Butte Creek fifth-field watershed. The effects of the PCGP are similar to those of a road, including the potential for sediment mobilization and transport. Road improvement efforts (resurfacing) help restore hydrologic connectivity and reduce road-related sediment that could be delivered to stream channels.	LSR	8.3 miles
BLM	Road Sediment Reduction	Little Butte Cr. Road Resurface (Ashland Resource Area)	Little Butte Creek is a Tier 1 Key Watershed. The PCGP has approximately 6 miles of corridor and seven stream crossings on BLM lands in the Little Butte Creek fifth-field watershed. The effects of the PCGP are similar to those of a road, including the potential for sediment mobilization and transport. Road improvement efforts (resurfacing) help restore hydrologic connectivity and reduce road-related sediment that could be delivered to stream channels.	LSR	10.6 miles

TABLE 2-57

Proposed Mitigation Measures on NFS Lands and BLM lands in the Little Butte Creek Watershed in the Rogue River National Forest

Agency	Mitigation Group	Project Name	Project Rationale	Land Allocation	Quantity
	Stand Density Fuel Break	Little Butte Creek LSR Precommercial Thin	The project would result in additional fragmentation and preclude the recovery of fragmented habitat for those stands adjacent to the project right-of-way. Maintenance of the project right-of-way would provide a continued vector for predators, early-seral species, and non-native species. Also, the project would result in a direct loss of biological services provided by mature forest characteristics for many decades past the life of this project. Both mature stands and developing stands would be removed during pipeline construction. Density management of forested stands would assist in the recovery of late-seral habitat, impacts from fragmentation, and a reduction in edge effects and enhance resilience of mature stands. Accelerating development of mature forest characteristics would shorten the impacts of those biological services lost due to pipeline construction. Thinning of young stands is a recognized treatment within LSRs if designed to accelerate development of late-successional habitat characteristics (NWFP ROD pages B-11 and C-12, ACS objectives C-11 and C-17).	LSR	618 Acres
	Terrestrial Habitat Improvement	Little Butte Creek Mardon Skipper Butterfly	The Dead Indian Plateau region is one of three known sites for Mardon skipper butterflies in the world. It is also adjacent to a known site for short-horned grasshoppers. Both species are on the Forest Service Sensitive Species list. The requirement for a permanent open corridor provides a unique opportunity to develop habitat for these species. Planting the project right-of-way with plants preferred by these species has the potential to increase the habitat for and local range of these two species. Rehabilitation of disturbed sites is required under various BMP guidelines.	LSR	20 Acres
	Terrestrial Habitat Improvement	Little Butte Creek LSR LWD Placement	This project would mitigate for the loss of recruitment of LWD to adjacent stands and within the construction clearing zone. The project would forgo the development of large down wood for the life of the project and for decades afterwards. Downed wood is a critical component of mature forest ecosystems. Large wood replacement would partially mitigate for the barrier effect of the corridor by creating structure across the corridor for use by small wildlife species. Placement in wood deficient areas adjacent to the corridor allows for scattering of stockpiled wood, reducing localized fuel loads while improving habitat in deficient stands. Larger logs maintain moisture longer and are less likely to be fully consumed by fire. Acres that can be treated are necessarily limited by material available from the project right-of-way.	LSR	511 Acres

TABLE 2-57

Proposed Mitigation Measures on NFS Lands and BLM lands in the Little Butte Creek Watershed in the Rogue River National Forest

Agency	Mitigation Group	Project Name	Project Rationale	Land Allocation	Quantity
	Terrestrial Habitat Improvement	Little Butte Creek LSR Snag Creation	This project would mitigate immediate and future impacts to snag habitat from the clearing of the pipeline right-of-way. The project prevents development of large snags during the life of the project and for decades afterwards. Project construction would result in loss of snag habitat on approximately 775 acres of project right-of-way (includes safety zone buffer). This project would add to cumulative impacts. As snags are a critical component of LSR spotted owl habitat, replacement is needed. Snag requirements are specifically outlined in the Forests' LRMPs and NWFP. Forests require analysis and mitigation under most management activities. There would be a 10-year delay as snag decay develops. Snag management is required in the Rogue River–Siskiyou National Forest LRMP (page 4-20), with levels set under the various management directions. Snag management is discussed in the NWFP for LSRs on pages C-14 and C-15 of the ROD (items 4 and 7). Snag management levels are based on the Forest's Plant Association Guidelines. Snags are also discussed in the South Cascades LSR Assessment (chapter 3).	LSR	622 Acres
	Reallocation of Matrix Lands to LSR	LSR 227 Addition	This is the Little Butte Creek portion of amendment RRNF-7, which would reallocate 512 acres from the matrix land allocation to the LSR land allocation. This action contributes to the "neutral to beneficial" standard for new developments in LSRs by adding acres to the LSR land allocation to offset the long-term loss of acres and habitat from the construction and operation of the project.	LSR	25 Acres

Relationship of Offsite Mitigation Measures Related to the ACS and Watershed Assessment or Late Successional Reserve Assessment Recommendations

This section describes the relationship between the recommendations of the Southwest Oregon LSR Assessment (Forest Service et al. 1998), the Little Butte Creek watershed assessment (BLM and Forest Service 1997) and the LRMP of the Rogue River–Siskiyou National Forest as amended by the NWFP and mitigation measures in LSR 227 and the Tier 1 Key Watershed portion of Little Butte Creek located on the Rogue River–Siskiyou National Forest.

Recommendation - Road Decommissioning. Reduction in road density was identified as a method for improving watershed conditions (Forest Service and BLM 1997; appendices F, K). High-priority areas identified in the Little Butte Creek watershed assessment and proximity to the effects of the project right-of-way were used to develop road decommissioning proposals.

- **Project Mitigation – Road Decommissioning.** The purpose of the road decommissioning project is to offset potential watershed effects from construction and to reduce impacts on wildlife habitat from edge effects and fragmentation associated with the project right-of-way. In 2010 the Forest Service completed a forest-wide transportation planning project to identify roads that are necessary for the National Forest's designated transportation system. As a result of transportation planning project and other access considerations, 57.5 miles of roads on NFS lands in the Little Butte Creek watershed were identified that are no longer needed for access and can be decommissioned. There are 6.7 miles of roads and

32 stream crossings in Riparian Reserves (tables 2-58 and 2-59). Current road density in LSR 227 is 3.3 miles per square mile. With the proposed road decommissioning, the density would be reduced to 2.5 miles per square mile, a 24% reduction in road density measured in miles of road per square mile of LSR. Reduction in road density within a quarter mile, half mile, and 1 mile of the project right-of-way is shown in table 2-60.

- **Road Decommissioning Effects on Watershed Function.** Impacts of roads on watershed values are well-documented (Trombulak and Frissell 2000; Switalski, Bissonette et al. 2004). Decommissioning roads can substantially reduce sediment delivery to streams (Madej 2000; Keppeler, Cafferata et al. 2007). The proposed road decommissioning would increase infiltration of precipitation, reduce surface runoff, and reduce sediment production from road-related surface erosion in the watershed where the effects from the project occur. Assuming a 20-foot average road width, 57.5 miles of proposed road decommissioning would revegetate approximately 140 acres that are currently native road surfaces in the Little Butte Creek watershed.

- **Riparian Restoration.** The project crosses one intermittent and one perennial stream on NFS lands in the watershed, affecting 5.27 acres of riparian vegetation (table 2-48). One perennial stream crossing at approximately MP 167.67 is a conventional bore and would not result in any affects to Riparian Reserves. Decommissioning roads in Riparian Reserves and at stream intersections has the effect of restoring connectivity within aquatic ecosystems and allowing riparian vegetation to become reestablished in riparian areas now occupied by road beds (Switalski, Bissonette et al. 2004). Approximately 6.72 miles of proposed road decommissioning on NFS lands in the Little Butte Creek watershed would occur in Riparian Reserves. A total of two stream crossings as shown below in tables 2-58 and 2-59 would be restored by proposed road decommissioning. As vegetation becomes reestablished at these crossings, it is expected that road-related sediment transport to aquatic ecosystems would be reduced (Madej 2000; Keppeler, Cafferata et al. 2007). This also supports ACS objectives 2, 3, 4, and 5, in the Little Butte Creek Tier 1 Key Watershed by reducing compaction and by revegetating approximately 14.3 acres of decommissioned roadbeds within Riparian Reserves.

TABLE 2-58

Comparison of Project Effects and Proposed Road Decommissioning on NFS Lands, Little Butte Creek Tier 1 Key Watershed

Rogue River NF	Miles in Watershed	Miles in Riparian Reserves	Acres in Riparian Reserves	Acres in Degraded Soil Condition/ Acres Restored a/	Stream Crossing
Project Right-Of-Way	13.87	0.25	5.27	60-137 degraded	1 Class II3 1 Class IV
Proposed Decommissioned Roads	57.5	6.72	14.3	138 Restored	1 Class II, 1 Class III 29 Class IV

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a/ Based on 14-foot road width. Figure 2.5-4 uses a midpoint of 104 acres for potentially degraded soils.

TABLE 2-59

Stream Crossings in Decommissioned Roads by Subwatershed and Stream Class on NFS Lands, Little Butte Creek

Sixth-Field Subwatershed	Class II	Class III	Class IV
Beaver Dam Subwatershed		1	7
Middle South Fork Subwatershed			6
Upper North Fork Subwatershed			8
Upper South Fork Subwatershed	1		9
Total	1	1	30

TABLE 2-60

Changes in Road Density on NFS lands with Implementation of Forest Service Mitigation Plan, Little Butte Creek Tier 1 Key Watershed

Rogue River NF	Current Condition (miles/square mile)	With Road Decommissioning (miles/square mile)	Change in Road Density with Decommissioning (miles/square mile)
NFS Lands in Little Butte Creek watershed	3.27	2.67	-0.6
LSR 227 in Little Butte Creek watershed	3.87	3.09	-0.78
Within 1 mile of pipeline	4.18	2.77	-1.41
Within 1/2 mile of pipeline	4.12	2.71	-1.41
Within 1/4 mile of pipeline	3.91	2.56	-1.35

Source: Forest Service GIS Analysis

Recommendation—Soil Productivity. Manage for an abundance of CWD in various decaying conditions in forested areas across the landscape (BLM and Forest Service 1997: 182).

Recommendation—Vegetation. Provide for well-distributed LWD across the landscape for maintaining the ecological functions of the species dependent on coarse wood (BLM and Forest Service 1997: 187). Maintaining the maximum levels of LWD consistent with reasonable fuel loadings appears to have considerable potential for enhancing site quality. Mid-seral stands with no LWD may have yields 12% lower than stands with sufficient LWD (BLM and Forest Service 1997: 75).

Recommendation—Terrestrial Wildlife Species and Habitat. Maintain adequate numbers of snags and amounts of LWD (see Vegetation section) for those species that require these special habitats for breeding, feeding, or sheltering (BLM and Forest Service 1997: 190).

- **Project Mitigation – Upland Placement of Large Woody Debris.** LWD placement in plantations is proposed to accelerate the development of LSOG characteristics by restoring this habitat component to plantations where shading is lacking. Large wood would be placed in approximately 511 acres of plantations that are also receiving stand density management treatment. Approximately 126 of those acres are in Riparian Reserves. The large wood would be from trees cut from the project right-of-way. Sites selected for fallen woody material placement would be within 0.5 mile of the project right-of-way. As with the other off-site mitigation measures, placement of the mitigation activities close to the project right-of-way can benefit species that are affected by the vegetation changes within the right-of-way and would make these mitigation measures more effective. Sites would be in early-successional stands that are currently deficient in fallen wood (as defined by Plant Association Group for Cascades White Fir forests). The large wood placement is expected to account for some of the range in variability found across the landscape. For logs 11 to 20 inches in diameter, densities would vary from 8 to 33 logs per acre. For logs over 20 inches in diameter, densities would vary from 3 to 12 logs per acre. Logs would be approximately 40 feet in length, and the specified diameter (i.e., 11 to 20 inches and over 20 inches) refers to the stem diameter at the midpoint of the 40-foot log.

- **Project Mitigation – Snag Creation.** Snag creation is proposed as a mitigation to replace snags lost in the project right-of-way for habitat for cavity-nesting birds and denning sites for mammals (e.g., bats, bears, fishers, etc.). Snags would be lost from the project right-of-way to facilitate pipeline construction or to mitigate safety hazards for construction workers. Approximately 1,200 snags would be created by blasting tops from live trees (preferably trees with existing decay that makes them more suitable for cavity-nesting birds and as denning sites) or by inoculating living trees with heart rot decay fungi. Sites selected for snag creation would be within 0.5 mile of the project right-of-way to develop snag habitat within (or near) the home ranges of cavity excavators being displaced by the project right-of-way. Sites would be in mid-successional stands or around the edges of early-successional stands that are currently deficient in snags, as defined by Plant Association Group for Cascades White Fir forests. Stand data for these plant associations (which are an indication of undisturbed forest snag levels) shows that these stands have an average of about four snags per acre in the range of 11 to 20 inches in diameter and an additional four snags per acre greater than 20 inches in diameter. If the tree diameters in the stands prevent snag creation in the greater than 20-inch-diameter size class, additional snags in the smaller size class (11 to 20 inches in diameter) would be created to make up for the deficit. For sites bordering early-successional stands, snags would be created within 100 yards of the stand boundary at the same trees-per-acre levels described above.

Recommendation—Vegetation. Enhance the structural diversity of vegetation classes by precommercial thinning treatments at staggered intervals and favoring trees of different heights and species at the time of treatment (BLM and Forest Service 1997: 188).

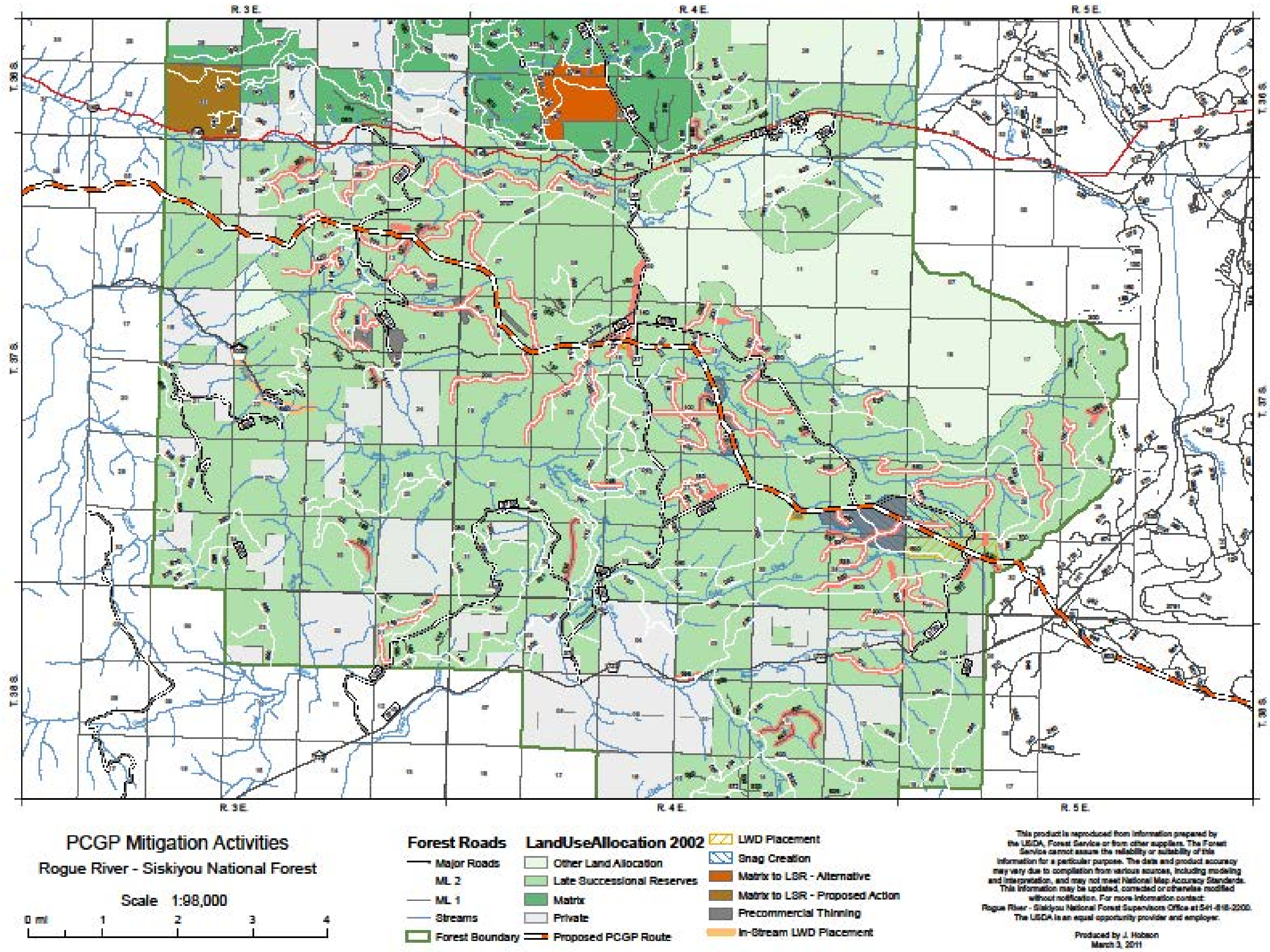
- **Project Mitigation - Stand Density Management:** Stand density management is proposed for overstocked plantations to accelerate the development of LSOG forest characteristics in LSR 227. This accelerated development would also reduce fragmentation and reduce edge effects and would help maintain the ability of these stands to respond to changed environmental conditions from either natural or human-caused disturbances. Fuels treatments for the slash generated by stand density management are decided on a case-by-case basis and rely on slash loading information as well as proximity to roads and other factors. Slash treatments may be as simple as lop and scatter to get the fuels in contact with the ground for more rapid decomposition, or they may involve piling and burning or removal of slash from the site. All 600 acres are within 0.5 mile of the project right-of-way and 126 acres are within Riparian Reserves. Placing the off-site mitigation activities near the project right-of-way increases their effectiveness by impacting lands within, or near, the home ranges of individual animals being affected by the pipeline's habitat changes.

Recommendation - Stream Structure. Large wood in streams contributes to the form and structure of a stream's channel and can control the distribution of aquatic habitats, stability of streambeds and streambanks, and routing of sediments and water through the system. Properly placed large wood traps and slows the movement of sediment and organic matter through the stream system. Large wood is particularly critical for steep tributaries because it can create a stepped stream profile, with stream energy dissipated in relatively short, steep sections of the channel (BLM and Forest Service 1997: 92).

- **Project Mitigation – In-Stream Placement of LWD:** In addition to restoration of LWD in Riparian Reserves and at channel crossings, shading would be placed in 1.5 miles of the South Fork Little Butte Creek below the project. This would contribute significantly to reducing sediment in the affected reach and downstream, and would add pool and riffle structure to the stream by narrowing the channel and trapping gravels.

Proposed mitigation activities in the Little Butte Creek watershed are shown on figure 2-11.

Figure 2-11 Proposed Mitigation Projects, Rogue River National Forest, Little Butte Creek Watershed



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Produced by J. Hobson
March 3, 2011

Summary. The applicant-filed off-site mitigation plan includes a number of actions that substantively contribute to the "maintain and restore" criteria of the ACS objectives at the site, subwatershed, and watershed scale on NFS Lands.

- Decommissioning 57.5 miles of roads, of which 4.3 miles (14.3 acres) lie in Riparian Reserves on NFS lands and 13.0 miles of roads, of which approximately 3.5 acres lie in Riparian Reserves on BLM lands. This significantly reduces sediment sources and would allow restoration of vegetation in Riparian Reserves on approximately 14.3 acres on NFS lands and 3.5 acres on BLM lands that are currently occupied by roads. This is responsive to ACS objectives 1, 2, 3, 4, and 5 and road density objectives for Key Watersheds.
- Road improvements including resurfacing on 21.85 miles of roads on BLM lands. This reduces sediment contributions from gravel roads and increases resilience to damage from winter rains. This is responsive to ACS objective 5.
- Creation of 1,200 snags on approximately 622 acres of NFS lands, of which an estimated 126 acres are within Riparian Reserves. This replaces snags cut in association with the project right-of-way. This is responsive to ACS objectives 1, 8, and 9.
- Placement of LWD on 622 acres, of which 126 acres are within Riparian Reserves. This replaces LWD removed during construction of the project and contributes to riparian habitats within Riparian Reserves. This is responsive to ACS objectives 1, 8, and 9. Stand density management (precommercial thinning) on approximately 600 acres of NFS lands, of which a portion estimated to be 126 acres occurs in Riparian Reserves. This has the effect of accelerating the development of larger trees and increasing stand diversity.34 This is responsive to ACS objectives 1, 8, and 9.
- Placement of LWD on 1.5 miles perennial fish-bearing streams on NFS lands. This replaces LWD that is removed from the project right-of-way. This is responsive to ACS objectives 1, 2, 3, 4, 5, 7, and 8.
- Installation of a screened diversion at an irrigation ditch in Lost Creek. This is responsive to ACS objective 2.

Cumulative Effects

Activities on NFS Lands

The Forest Service manages about 25% of the Little Butte Creek watershed. Projects on NFS lands that would contribute to cumulative effects with the project are shown in table 2-61.

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[34] Prorated by average percent of area occupied by Riparian Reserves in the Little Butte Creek watershed.

TABLE 2-61

Current and Reasonably Foreseeable Future Actions on NFS and BLM Lands in the Little Butte Creek Watershed

Unit	Fifth-Field Watershed	Sixth-Field Watershed	Project Name	Project Description	Affected Resource
RRNF	Little Butte Creek	Lower NF Little Butte Creek	2004 Deadwood Complex EA (Allotment Management Plan Update for Five Allotments)	400 acres of grazing on the South Butte Allotment	Hydrologic condition, water quality, cumulative watershed effects, aquatic species and habitats
RRNF	Little Butte Creek	Lower NF Little Butte Creek	2009 Fish Lake and Rancheria Allotment Management Plan Update	1,000 acres of grazing on the Fish Lake Allotment	Hydrologic condition, water quality, cumulative watershed effects, aquatic species and habitats
RRNF	Little Butte Creek	Lower South Fork Little Butte Creek	2004 Deadwood Complex EA (Allotment Management Plan Update for Five Allotments)	2,000- acres of grazing (900 acres on the South Butte Allotment, and 1,100- acres on the Conde Allotment)	Hydrologic condition, water quality, cumulative watershed effects, aquatic species and habitats
RRNF	Little Butte Creek	Upper North Fork Little Butte Creek	2004 Deadwood Complex EA (Allotment Management Plan Update for Five Allotments)	5,300- acres of grazing on the South Butte Allotment	Hydrologic condition, water quality, cumulative watershed effects, aquatic species and habitats
RRNF	Little Butte Creek	Upper North Fork Little Butte Creek	2009 Fish Lake and Rancheria Allotment Management Plan Update	6,500 acres of grazing on the Fish Lake Allotment	Hydrologic condition, water quality, cumulative watershed effects, aquatic species and habitats
RRNF	Little Butte Creek	Little South Fork Little Butte Creek	2013 Big Elk Cinder Pit CE (DM would be published within next 6 months)	Excavation of cinders from 5- acres of land in an existing cinder quarry	Quarry
RRNF	Little Butte Creek	Middle South Fork Little Butte Creek	2004 Deadwood Complex EA (Allotment Management Plan Update for Five Allotments)	14,100- acres of grazing (7,000- acres on the South Butte Allotment, 4,900- acres on the Deadwood Allotment, and 2,200- acres on the Conde Allotment)	Hydrologic condition, water quality, cumulative watershed effects, aquatic species and habitats
RRNF	Little Butte Creek	Upper South Fork Little Butte Creek	2004 Deadwood Complex EA (Allotment Management Plan Update for Five Allotments)	8,700- acres of grazing on the South Butte Allotment	Hydrologic condition, water quality, cumulative watershed effects, aquatic species and habitats
RRNF	Little Butte Creek	Beaver Dam Creek	2004 Deadwood Complex EA (Allotment Management Plan Update for Five Allotments)	16,800- acres of grazing (3,400- acres on the South Butte Allotment, 13,400- acres on the Deadwood Allotment	Hydrologic condition, water quality, cumulative watershed effects, aquatic species and habitats
MD_BLM	Little Butte Creek	Lick Creek	Salty Gardner DNA, FY2014-2015	540- acres of hazardous fuels treatment	WUI, upland vegetation, neo-tropical birds
MD_BLM	Little Butte Creek	Salt Creek	Bieber Salt Forest Management FY 2016, Salty Gardner DNA FY 2014-2015	756 acres of upland vegetation treatment, 721 acres of hazardous fuels treatment	Owls, NRF habitat, fish, upland and riparian vegetation, road sedimentation, road density, water quality, sensitive soils
MD_BLM	Little Butte Creek	Lower NF Little Butte Creek	Bieber Salt Forest Management FY 2016, Salty Gardner DNA FY 2014-2015	763- acres of upland vegetation treatment, 932- acres of hazardous fuels treatment	Owls, NRF habitat, fish, upland and riparian vegetation, road sedimentation, road density, water quality, sensitive soils

These activities are expected to be consistent with the Standards and Guidelines and objectives of the Rogue River–Siskiyou National Forest LRMP. Restoration thinning and hazardous fuels reductions are expected to contribute to improvements in watershed conditions by reducing stand density and reducing the probability of stand-replacing fire. Road improvements and decommissioning are expected to reduce road-related sediment transport to aquatic systems.

Activities on BLM and Private Lands

The BLM accounts for about 23% and private lands comprise about 52% of the Little Butte Creek watershed. Projects on BLM lands that might contribute cumulative effects to the project are shown in table 2-61. Private lands in the watershed are expected to be managed according to current land use patterns consistent with the County General Plan and existing federal and state statutes including the Oregon Forest Practices Act and the Clean Water Act.

Cumulative Effects

The project right-of-way comprises about 0.47% of the NFS lands and 0.26% of the Little Butte Creek watershed (table 2-46). The small proportion of the landscape affected by the project; ongoing land management on private lands; the regulatory framework between the BLM, ODEQ and ACOE applicable to the project; and project location and routing make it highly unlikely that the portion of the PCGP project on federal lands, when considered with other past, present, and reasonably foreseeable future actions would change watershed conditions in the Little Butte Creek watershed in any significant, discernable, or measurable way. (See also FEIS chapter 4.14, Cumulative Effects.)

Project Effects Compared by ACS Objective

Table 2-62 compares the project impacts to the objectives of the ACS for the Little Butte Creek watershed. NFS lands where the ACS applies comprise approximately 59,900.38 acres or 25.10% of the Little Butte Creek watershed (table 2-45). Riparian Reserves comprise approximately 8,096.50 acres (about 3.39% of the entire watershed) on NFS lands. Watershed conditions and recommendations are found in the Little Butte Creek watershed assessment (BLM and Forest Service 1997). A total of 10.22 acres or 0.13% of the Riparian Reserves in the watershed would be affected on:

- One perennial stream channel crossing
- One intermittent stream channel crossings
- One intermittent stream and one wetland where Riparian Reserves are clipped, but the associated waterbodies are not crossed by the project

TABLE 2-62

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Little Butte Creek Watershed

ACS Objective	Project Impacts
Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	Riparian Reserves are watershed-scale features. The project would affect about 10.22 acres or about 0.13% of Riparian Reserves on NFS lands in the Little Butte Creek watershed (table 2-47). There is one intermittent and one perennial stream channel crossed in the Little Butte Creek watershed on NFS lands. Impacts to aquatic systems are expected to be short-term and minor and limited to the project scale because of application of BMPs and erosion control measures (see section and 1.4.1). LWD cleared in construction of the project would be used to stabilize and restore stream crossings. Off-site mitigation measures including 57.5 miles of road decommissioning, approximately 1.5 miles of instream projects, snag creation, and LWD placement are expected to improve watershed conditions in the Little Butte Creek watershed (see tables 2-57, 2-58, 2-59, 2-60). While there

TABLE 2-62

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Little Butte Creek Watershed

ACS Objective	Project Impacts
	are long-term changes in vegetation in Riparian Reserves from construction clearing of the project right-of-way, these would be minor in scale and well within the range of natural variability given the disturbance history of the watershed (see table 2-40).
Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life-history requirements of aquatic and riparian-dependent species.	The project is not expected to affect spatial or temporal connectivity in the Little Butte Creek watershed because the pipeline would be buried in all aquatic habitats crossed, consistent with the requirements of the exhibits specified in the Wetland and Waterbody Crossing Plan. At each crossing, bed and bank disturbances from equipment crossing and trenching are small (<15 feet wide). After construction, all disturbed areas would be returned to their approximate preconstruction contours and drainage patterns. The temporary construction right-of-way would be restored and revegetated with native grasses, forbs, conifers, and shrubs, as outlined in the ECRP. After construction, key habitat components such as LWD and boulders would be restored onsite and the bed and banks would be returned to preconstruction conditions. By implementing these measures, lateral and longitudinal connectivity at the site scale would be maintained, although in the short-term during construction, connectivity may be disrupted. Except for a few days during the construction of the crossings, access to areas necessary for life histories of aquatic and riparian-dependent species would not be obstructed. By restricting stream crossing operations to the ODFW instream work window, possible impacts to sensitive life stages of aquatic biota would be minimized. Road decommissioning that occurs within Riparian Reserves (approximately 18 acres) would contribute to restoration of aquatic connectivity. The residual levels of disturbance are anticipated to be well within the range of natural variability in the Klamath-Siskiyou Province and the High Cascades Province (see table 2-54).
Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	Impacts to the bed and banks of aquatic features would be minor and limited to the site of construction because the pipeline would be buried and the actual area of bank and stream bottom disturbance is small at each crossing (<15 feet wide). This level of disturbance is comparable to a bank slough (see section 1.4.1.) or a culvert installation and well within the range of natural variability for watersheds of the Klamath-Siskiyou Province and the High Cascades Province (see table 2-54). After construction, key habitat components such as LWD and boulders would be restored onsite and the bed and banks would be returned to preconstruction conditions, consistent with the exhibits to the POD. By implementing these measures, the physical integrity of the aquatic system at the site scale would be maintained.
Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	Minor amounts of sediment would be mobilized during construction. These impacts are expected to be short-term and limited to the general area of construction (see section 1.4.1). No long-term impacts on water quality are expected because of application of the ECRP, which includes maintenance of effective ground cover and BMPs during construction (see section 1.4.1.1). Effective shade would be removed at the crossing of the South Fork Little Butte Creek at MP 162.45. A site-specific shade analysis (NSR 2009) found no temperature impacts at the site or at the stream network scale at this crossing.
Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.	The Little Butte Creek watershed sediment regime was historically characterized by pulse-type depositions of coarser sediments from landslides and surface erosion following major disturbances such as fires and high-intensity winter storms (BLM and Forest Service 1997). The current sediment regime in the watershed has replaced these pulse-type disturbances with more chronic erosion and deposition of fine sediments, primarily from urban and agricultural land use, timber harvest, and roads. Project construction and operation is not likely to alter this sediment pattern nor is it likely to exacerbate these conditions because of implementation of measures in the ECRP (see section 1.4.1), including maintenance of effective ground cover, water bars to dissipate overland flows, and maintenance of sediment barriers until revegetation is successful. Sediment impacts from construction are expected to be similar to those described in section 1.4.1.2. A pulse of sediment could be observed following the first seasonal rain, but this is likely to dissipate within a few hundred feet and would be indistinguishable from background levels. Any sediment impacts are expected to

TABLE 2-62

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Little Butte Creek Watershed

ACS Objective	Project Impacts
	be well within the range of natural variability for the Klamath-Siskiyou Province and the High Cascades Province (see table 2-54). Proposed mitigation projects including road decommissioning would contribute to a reduction in sediments and restoration of aquatic functions at the watershed scale (see table 2-57).
Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.	The project is unlikely to affect peak flows in the Little Butte Creek watershed because of the dispersed nature of impacts, the current hydrologically recovered conditions in the watershed, the relatively small proportion of the watershed affected (0.25%), and the relative lack of connectivity to aquatic systems (see table 2-54). Decommissioning roads (57.5 miles) as part of the offsite mitigation plan would contribute substantively to the restoration of flow patterns by restoring hydrologic connectivity at stream crossings that are decommissioned (see table 2-57).
Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	The project clips one small wetland on NFS land but does not cross it. Application of the ECRP including maintenance of effective ground cover and BMPs will be implemented during construction (see section 1.4.1.1). In addition, decommissioning 57.5 miles of roads, 18 acres of which are in Riparian Reserves (see table 2-57) would contribute substantially to restoring floodplain functions where these projects occur.
Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation; nutrient filtering; and appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse, woody debris sufficient to sustain physical complexity and stability.	The project impacts on riparian vegetation in the Little Butte Creek watershed would be minor. Approximately 10.22 acres or 0.13% of the Riparian Reserves in the watershed are potentially affected by the project (table 2-48). Existing herbaceous and brush cover would be maintained in Riparian Reserves to the extent practicable. Following construction, replanting with native species would facilitate reestablishment of vegetation communities. LWD and boulders from the project right-of-way would be returned to disturbed riparian areas. LWD placement and snag creation on 126 acres in Riparian Reserves, along with revegetation on 18 acres of roads that would be decommissioned, would help to reestablish species composition and structural diversity of plant communities in Riparian Reserves (see table 2-57).
Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	The project impacts on riparian vegetation in the Little Butte Creek watershed would be minor. Approximately 10.22 acres or 0.13% of the Riparian Reserves in the watershed are potentially affected by the project. Following construction, replanting with native species would facilitate reestablishment of vegetation communities. LWD and boulders from the project right-of-way would be returned to disturbed riparian areas. LWD and snag creation on 126 acres in Riparian Reserves, along with revegetation on 18 acres of Riparian Reserves in roads that would be decommissioned, would help to reestablish species composition and structural diversity of plant communities in Riparian Reserves. The project would waive application of Management Recommendations for Survey and Manage species in the watershed but would not prevent attainment of the ACS objectives because the viability of riparian-dependent Survey and Manage species would not be threatened. (see appendix F.5).

Summary

The Little Butte Creek watershed is the largest and the most complex watershed crossed by the project. With 13.87 miles of corridor and 209.32 acres of clearing on NFS lands, this watershed has the most NFS land area affected of all watersheds crossed by the project. The watershed is geologically and ecologically complex, with both Klamath-Siskiyou Province and High Cascades Province landscapes. It is ecologically diverse and important, providing some of the most productive coho salmon streams in the Upper Rogue Basin. Little Butte Creek watershed is a Tier 1 Key Watershed above the confluence of the North and South Forks of Little Butte Creek, and roughly 88% of the NFS lands in the watershed are managed as LSR (see tables 1-1 and 1-2). Against this backdrop, compliance with the ACS is an important measure of project impacts.

Pacific Connector has modified the project to respond to the ACS objectives and has incorporated measures consistent with the Riparian Reserve Standards and Guidelines. The assessment demonstrates that short-term impacts associated with the project would occur to streambanks and to substrates at the site scale. Change in vegetative condition from clearing of forest within the project right-of-way is a long-term impact. These impacts, however, are well within the range of natural variability given the disturbance processes that function in the watershed (see table 2-54). This is especially apparent when considering the total amount of Riparian Reserves that are located within the Little Butte Creek watershed (8,096.50 acres) and the amount of clearing (10.22 acres) in Riparian Reserves (0.13% of the Riparian Reserves in the watershed) (table 2-47). Also, because of the linear characteristic of the pipeline, the Riparian Reserve crossings would be spread out across the landscape.

Off-site mitigation measures including over 66 miles of road decommissioning (57.5 miles are within Key Watershed), 1.5 miles of LWD instream projects, and 32 sites of aquatic and riparian habitat improvement projects identified by the Forest Service, would supplement onsite minimization, mitigation, and restoration actions. Off-site mitigation projects on BLM that include 8.6 miles of LWD instream projects, one site of aquatic and riparian habitat improvement project, and 25.6 miles of road sediment reduction would also supplement on-site minimization, mitigation, and restoration actions. These proposed offsite mitigation measures are responsive to recommendations in the Little Butte Creek watershed assessment (1997) and the South Cascades Late-Successional Reserve Assessment (1998). Mitigation measures associated with the project are responsive to watershed assessment recommendations and would improve watershed conditions where they are applied (see tables 2-57 and 2-58).

Three site-specific amendments of the Rogue River–Siskiyou National Forest LRMP related to the ACS are proposed to make provisions for the project:

- Proposed amendment RRNF-5 would allow the project to cross the MA 26 Restricted Riparian land allocation at one location on the South Fork Little Butte Creek. This amendment would not prevent attainment of ACS objectives. A site-specific temperature assessment (NSR 2009) showed there would be no temperature increase from shade removal at this location. Effective ground cover and sediment barriers would be maintained, and the implementation of the ECRP is expected to control surface erosion and reestablish native vegetation.

- Proposed amendment RRNF-6 would allow the project to exceed detrimental soil conditions within the construction corridor. This would not prevent attainment of ACS objectives. The project would require soil remediation as needed with organic materials in areas with potential revegetation difficulty, soil decompaction, maintenance of effective ground cover, application of BMPs, and application of offsite mitigation measures. Therefore, any sediment impacts from detrimental soil conditions are expected to be minor and short-term, and the methods described above would be expected to effectively moderate detrimental soil conditions. Implementation of measures in the ECRP is expected to effectively control surface erosion and restore native vegetation (see FEIS section 4.3.4).

- Proposed amendment of the Rogue River–Siskiyou National Forest LRMP to waive protection measures for Survey and Manage species would not prevent attainment of ACS

> objectives because the persistence of riparian dependent Survey and Manage species would not be threatened (see appendix F.5).

The project is otherwise consistent with Standards and Guidelines for activities in Riparian Reserves for the Rogue River–Siskiyou National Forest.

The routing of the pipeline through NFS lands, coupled with the relatively small area of NFS land affected by project construction (0.47% of NFS lands in the fifth-field watershed), makes it highly improbable that project impacts would affect watershed conditions. The lack of intersections with aquatic systems serves to further minimize possible impacts (see section 2.2.2.1). Although there are project-level impacts from short-term sediment and long-term change in vegetative condition at stream crossings, these would be minor in scale (see section 2.2.2.4).

No project-related impacts that would prevent attainment of ACS objectives have been identified (see section 2.5.5.8). All relevant project impacts are within the range of natural variability for watersheds in the Klamath-Siskiyou and High Cascades Provinces, although some of these processes have been altered from their natural condition (see section 2.2.2.4).

2.2.3 Klamath River Basin

2.2.3.1 Geographic Setting

The Klamath River is notable because only the Klamath and Columbia Rivers cross the Cascade Mountains. The Klamath Basin geography, topography, hydrology, and biology are unique compared to other watersheds in the Pacific Northwest. Water in the Klamath River, unlike other watersheds in the Pacific Northwest, originates in relatively flat, open valleys east of the Cascades before crossing the Trinity and Coast Ranges in a steep river canyon and intercepting cold water inputs from the Scott, Salmon, and Trinity Rivers. Irongate dam is the dividing line between the Upper and Lower Klamath Subbasins. The Klamath River flows through mountainous terrain from the Oregon-California State line to the reaches downstream from Iron Gate dam. Downstream from Iron Gate dam, and for most of the river’s length to the Pacific Ocean, the river maintains a relatively steep, high-energy channel.

The Klamath River originates just downstream from Upper Klamath Lake in southern Oregon and flows 253 miles southwest through northern California to the Pacific Ocean. The Upper Klamath Basin has five main lakes: Crater Lake, Upper Klamath Lake, Lower Klamath Lake, Clear Lake, and Tule Lake. The Lower Klamath Basin, with its border beginning at Iron Gate dam, is almost 200 miles long and contains the four major Klamath River tributaries: the Shasta, Scott, Salmon, and Trinity Rivers. The basin is generally rural, with a total population of approximately 120,000. Its largest communities are Klamath Falls, Oregon, and Yreka, California.

The Pacific Connector project lies in the Upper Klamath Subbasin. The upper Klamath Subbasin encompasses approximately 8,000 square miles and is located in south-central Oregon and northeastern California. The Oregon part of the subbasin (more than 5,600 square miles) lies primarily in Klamath County, with smaller parts in Jackson and Lake Counties. The California part of the subbasin (more than 2,300 square miles) lies in Modoc and Siskiyou Counties. The upper Klamath Subbasin spans parts of the Sierra-Cascade Mountains to the west and the Basin and Range geologic region to the east. Down faulted valleys and fault block mountains of the Basin and Range region terminate against the Cascade Mountains. In the upland areas of the Klamath

Subbasin to the north, the Wood and Williamson Rivers originate from the eastern flank of Mount Mazama (Crater Lake). To the east, the Sprague and Lost Rivers flow westward from more arid parts of the basin. The California portion of the basin to the south is characterized by closed lake basins that are more typical of the Basin and Range region.

2.2.3.2 Climate and Hydrology

The Upper Klamath Subbasin climate is characterized by hot, dry summers and wet winters with moderate to low temperatures. At its higher elevations (above 5,000 feet amsl), the Upper Klamath Subbasin receives rain and snow during the late fall, winter, and spring. Peak stream flows generally occur during snowmelt runoff in late spring/early summer. After the runoff period, flows drop in the late summer/early fall. Annual basin precipitation amounts range from 15 inches at valley floors to more than 40 inches in the Cascade Mountains. Sixty to seventy percent of the precipitation occurs from October through March. An average of about 4 inches of rain falls during the period from April through September. The portion of the Upper Klamath Subbasin affected by the PCGP is all in the High Cascades Province and is dominated by pumice soils. Infiltration rates and water storage capacity of pumice plateau landscapes are high, although water retention in surface soils is very low in summer. Late summer streamflows are sustained by the slow release of snowmelt from large wetland complexes such as Buck Lake.

The Klamath Basin is home to 19 native fish species. The Klamath Basin once produced large runs of steelhead, Chinook salmon, coho salmon, green sturgeon, eulachon, coastal cutthroat trout, and Pacific lamprey. Runs of these anadromous fish contributed substantially to tribal, commercial, and recreational fisheries. Iron Gate dam (35 miles below the Pacific Connector project) currently blocks all anadromous fish passage. The Department of Interior has proposed to remove Irongate and other dams that block anadromous fish on the Klamath River in 2020.

Coho salmon, which is currently listed as “threatened” under the Endangered Species Act, are currently widely distributed in the Klamath River downstream from Iron Gate dam (RM 190). Before the construction of the dams, coho salmon were apparently common and widely distributed throughout the watershed, probably in both mainstem and tributary reaches up to and including Spencer Creek (Reclamation 2013).

Spencer Creek is the only fifth-field watershed crossed by the Pacific Connector project in the Klamath Basin where the ACS applies on NFS lands. Spencer Creek is 35 miles above Iron Gate dam. It flows into the Klamath River at the upper end of the reservoir created by the JC Boyle dam.

2.2.3.3 Spencer Creek Fifth-Field Watershed, HUC 180102206

Overview

The portion of the Spencer Creek watershed crossed by the project on NFS lands is a Tier 1 Key Watershed (see section 1.1.3). Key watersheds contribute directly to conservation of at-risk anadromous salmonids and resident fish species by providing high-quality habitat. A network of Tier 1 Key Watersheds ensures that refugia for at-risk species are widely distributed across a landscape to provide requisite connectivity.

The Spencer Creek watershed is part of the Upper Klamath Subbasin in the High Cascades Province[35]. The 54,160-acre Spencer Creek watershed is located in Klamath County, approximately 20 miles west of Klamath Falls (figure 1-1) and north of the Klamath River. The watershed originates at the crest of the southern Oregon Cascades Range, flows southeast, and empties into the Klamath River at the upper end of the JC Boyle Reservoir, which is part of PacifiCorps' Klamath River hydroelectric project. Elevations range from approximately 8,200 feet amsl at the top of Aspen Butte to 4,000 feet amsl at the mouth of Spencer Creek at JC Boyle Reservoir. Prior to construction of the Klamath River hydroelectric project, coho and Chinook salmon and Pacific lamprey used the lower reaches of Spencer Creek for spawning and rearing. If the Klamath dams, including the JC Boyle dam, are removed as planned, Spencer Creek would once again provide spawning habitat for Chinook and coho salmon (Bureau of Reclamation 2012).

Unique watershed features include Buck Lake, a large, shallow snowmelt wetland that lies in the upper end of the watershed. This lake is a significant contributor to the ecological systems within the watershed. Buck Lake was drained in the 1940s and no longer fully functions as a perennial wetland but it does have seasonal wetland characteristics. The northeastern part of the watershed lies within the Mountain Lakes Wilderness Area where no significant past management activities, with the exception of fire suppression, have occurred. Private lands in the lower part of the watershed are managed for timber production and open range grazing.

The watershed is bisected by the Dead Indian Memorial Highway, which runs generally east-west, and the Clover Creek county road, which runs generally northwest-southeast and parallels Spencer Creek for several miles. A small unincorporated community is located at the junction of the Clover Creek Road and the Dead Indian Memorial Highway.

The portion of Spencer Creek watershed traversed by the project is typical of the High Cascades Province. Soils dominating the landscape are characterized by high snowmelt infiltration and low summer water retention. Streamflows are dominated by spring snowmelt. Streams often develop braided channels where they encounter pumice flats, which changes the stream gradient, and may become intermittent, surfacing again downstream. Low gradients, porous soils, and deep alpine glacial till in some areas combine to create a system with low stream densities (0.3 mile of perennial streams per square mile and 0.9 mile of intermittent streams per square mile) (BLM et al. 1995: 4-4-155).

Vegetation in the watershed is primarily a mixed-conifer forest dominated by white fir and large stands of lodgepole pine. Private lands have been managed intensively for timber production and grazing and are dominated by younger aged stands and early-seral brush communities. Fire suppression has resulted in overly dense white fir understory vegetation and accumulations of dead fuel. Under drought conditions, these fuels may cause large, high-intensity stand-replacing fires. At the time the watershed analysis was prepared, 25% of the federal land within the Spencer Creek watershed was late successional forest and 29% was mid-seral stage forest. The percentages of seral stages on NFS land are shown in table 2-65

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[35] Provinces discussed in this document are based on both ecological and geological conditions and therefore do not match those recognized by the Oregon Department of Geology and Mineral Industries and the Oregon State Board of Professional Geologists and Geophysicists. The Klamath-Siskiyou Province is known by professional geologists as the Klamath Mountains Province and the Western Cascades and the High Cascades are two mountain ranges within the Cascades Mountains Province. See https://www.oregongeology.org/learnmore/geologicsightseeing.htm

Figure 2-12 shows the ownership pattern of the watershed. Relatively contiguous NFS lands (40% of all ownerships) dominate the upper watershed. Scattered BLM lands (16% of all ownerships) and interspersed private lands (44% of all ownerships) dominate the lower watershed. Increases in conifer populations as well as fire suppression have led to the loss of aspen stands throughout the Inland West. Further losses have occurred because aspen parklands have been converted to meadows for livestock grazing, with others degraded from logging and continual intense recreational use. Within the Spencer Creek watershed, aspen patches reportedly occurred around Buck Lake, along wet areas, and along streams and meadows near Spencer Creek; however, only remnants of those stands now remain (BLM et al. 4-27).

Buck Lake, Upper Spencer Creek, Clover Creek, and Lower Spencer Creek subwatersheds make up the Spencer Creek watershed (table 2-63). The Spencer Creek watershed has approximately 110 miles of fish bearing and intermittent streams that depend on healthy, functioning riparian areas for key habitat input factors. One short stretch of lower Clover Creek is fish-bearing from its connection to Spencer Creek, but becomes intermittent during late summer in most years. In addition, over 2,000 acres of wetland area in and around Buck Lake and along Spencer Creek have important effects on water quality and hydrologic function. Buck Lake is privately owned and was drained to provide pasture for cattle; however, it remains an important area for aquatic function in Spencer Creek. Approximately 1,672.49 acres of Riparian Reserves occur on NFS lands in the Spencer Creek watershed. There are roughly 5,319.16 acres of designated LSR and 10,083.65 acres of matrix lands within the Spencer Creek watershed.

Location and Routing

The project crosses a broad ridge from the Little Butte Creek watershed in the Rogue Basin to the Klamath Basin and the Spencer Creek watershed at MP 168.00. The project right-of-way crosses the Dead Indian Memorial Highway at MP 168.84 and continues cross-country to MP 169.54, where it intersects the Clover Creek Road, a two-lane paved Klamath County road. The project runs directly adjacent to the Clover Creek Road for the next 17 miles, crossing portions of the Upper Spencer Creek, Clover Creek, and Lower Spencer Creek subwatersheds, exiting the watershed at MP 183.02.

The total length of the corridor in the watershed is approximately 15.13 miles. Approximately 6.05 miles of the project would be on NFS lands. Of those, 3.92 miles would be in the Buck Lake subwatershed and 2.13 miles would be in the Upper Spencer Creek subwatershed (table 2-64). The project crosses NFS lands between MP 168 and 169.37 and then intermittently between MP 169.37 and MP 175.37. The project would be on NFS lands adjacent to the Clover Creek Road. The project was originally proposed to run parallel to the Clover Creek Road 400 feet to the west. The project was moved adjacent to the Clover Creek Road at the request of the Forest Service to avoid creating a second corridor that may adversely affect wildlife values and create an unmanageable strip between the road and the project. Of the 15.13 miles of project corridor in the Spencer Creek watershed, approximately 13 miles are adjacent to the Clover Creek road where stream crossings and clearing riparian vegetation have already occurred. By utilizing this existing corridor, the project avoids creating a second clearing that would further fragment Riparian Reserves and wildlife habitat. This routing also places the Clover Creek road between the project right-of-way and the Riparian Reserve associated with Spencer Creek.

A total of 207.76 acres would be affected by the project, including 193.63 acres cleared and 14.13 acres modified. On NFS lands, approximately 80.16 acres would be cleared and 11.56 acres would be modified. This accounts for approximately 0.41% of the NFS lands in the watershed (table 2-64.

No LSR lands would be affected by the project in the Spencer Creek watershed. Most effects to NFS lands are on matrix lands where 81.11 acres are affected, including 71.06 acres cleared and 10.05 acres modified (0.36% of NFS lands). There are four intermittent stream channel and two wetland crossings on NFS lands. Four Riparian Reserves of intermittent streams and two wetlands are clipped, but the associated waterbody is not crossed by the project right-of-way (table 2-66). Approximately 8.63 acres of Riparian Reserves, or about 0.04% of the Riparian Reserves on NFS lands in the watershed, would be cleared (table 2-65). About 4.58 acres of Riparian Reserves on NFS lands would be cleared in LSOG forest. All of the crossings in Spencer Creek are rated as "blue" or at low risk from construction impacts (table 2-67).

Figure 2-12 PCGP Routing and Subwatershed Boundaries, Spencer Creek Watershed

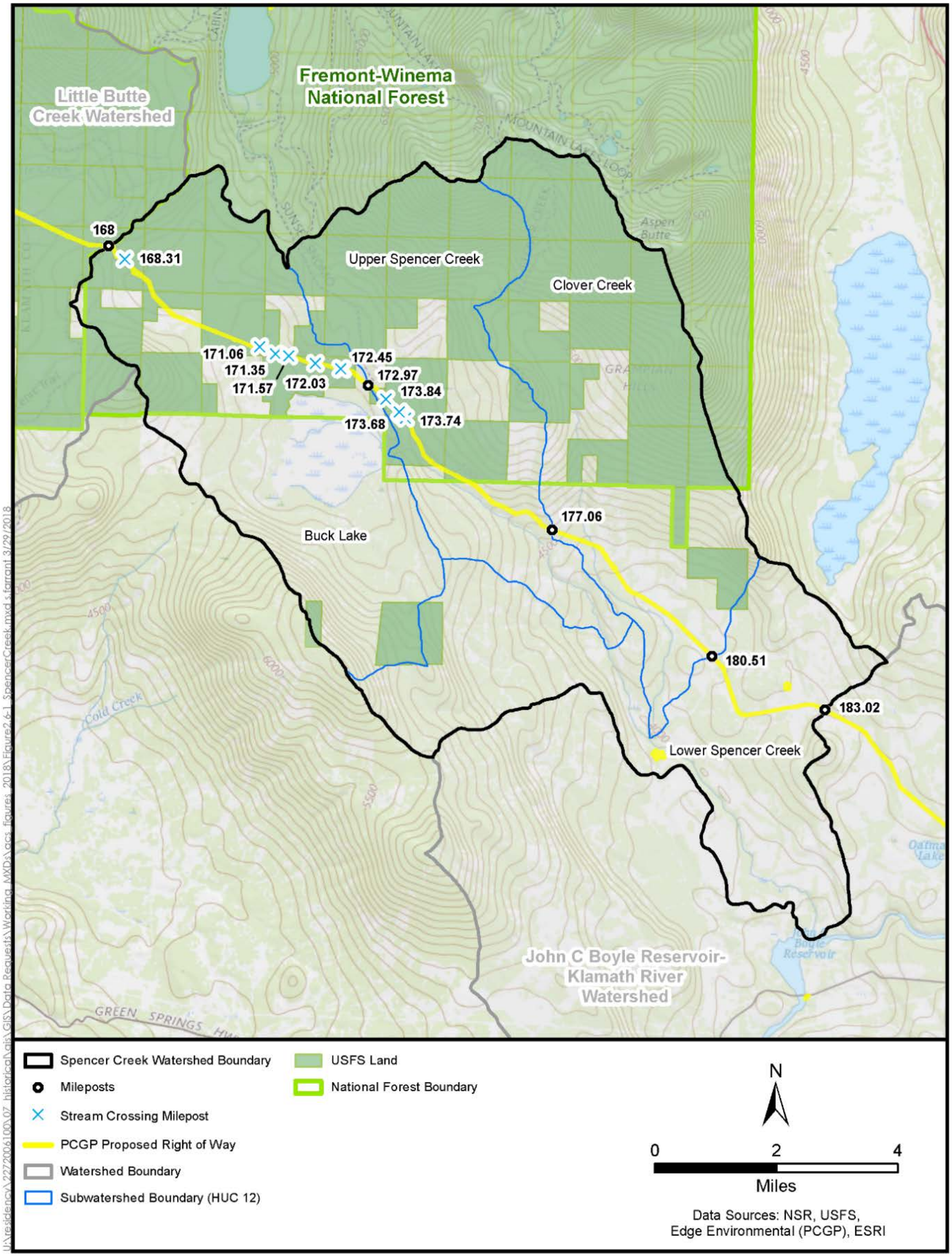

TABLE 2-63

Land Ownership and Forest Service Land Allocations (acres) in Spencer Creek Fifth-Field Watershed (HUC 1801020601)

	Land Ownership (acres)					Forest Service Land Allocation (acres)		
Sixth-Field Watershed	**Sixth-Field Watershed (acres) a/**	**NFS Land**	**BLM**	**Total NFS and BLM**	**Other**	**LSR**	**Riparian Reserves b/**	**Matrix**
Buck Lake	15,182.26	6,398.22	3,597.12	9,995.34	5,186.92	1,227.03	480.32	4,702.31
Clover Creek	14,094.78	8,461.83	1,182.13	9,643.96	4,450.82	2,169.71	581.25	2,986.44
Lower Spencer Creek	13,265.30	264.23	2,540.91	2,805.14	10,460.16	0.00	0.00	261.92
Upper Spencer Creek	11,704.41	7,198.75	1,431.11	8,629.86	3,074.55	1,922.42	610.92	2,132.98
Watershed Total	**54,246.75**	**22,323.03**	**8,751.27**	**31,074.30**	**23,172.45**	**5,319.16**	**1,672.49**	**10,083.65**

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a/ All data derived from Stantec-based GIS layers.
b/ May occur within other NFS land allocations.

TABLE 2-64

Project Corridor (miles) and Project Area (acres) in Spencer Creek Fifth-Field Watershed (HUC 1801020601) by Land Ownership

	Land Ownership							
	NFS Lands				Entire Sixth-Field Watershed			
		Project Area (acres)				Project Area (acres) b/		
Sixth-Field Watershed a/	**Corridor Length (miles)**	**Cleared**	**Modified**	**% of NFS Land Impacted**	**Corridor Length (miles)**	**Cleared**	**Modified**	**% of Sixth-Field Watershed Impacted**
Buck Lake	3.92	53.05	10.60	0.99	5.08	69.43	13.13	0.54
Clover Creek	0.00	0.00	0.00	0.00	3.45	43.39	0.00	0.31
Lower Spencer Creek	0.00	0.00	0.00	0.00	2.51	31.12	0.00	0.23
Upper Spencer Creek	2.13	27.11	0.96	0.39	4.09	49.69	1.18	0.43
Watershed Total	**6.05**	**80.16**	**11.56**	**0.41**	**15.13**	**193.63**	**14.31**	**0.38**

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a/ All data derived from Stantec-based GIS layers.
b/ Includes NFS, BLM, and other ownerships.

TABLE 2-65

Project Area (acres) on NFS Lands in the Spencer Creek Fifth-Field Watershed (HUC 1801020601) by Land Allocation

Sixth-Field Watershed a/	Designated LSR b/				Matrix				Riparian Reserves b/			
	Project Area (acres)		% of Total LSR on NFS Land		Project Area (acres)		% of Total Matrix on NFS Land		Project Area (acres)		% of Total Riparian Reserves on NFS lands c/	
	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified	Cleared	Modified
Buck Lake	0.00	0.00	0.00	0.00	47.96	9.71	1.02	0.21	4.74	0.74	0.99	0.15
Clover Creek	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lower Spencer Creek	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Upper Spencer Creek	0.00	0.00	0.00	0.00	23.10	0.34	1.08	0.02	3.89	0.61	0.64	0.10
Watershed Total	**0.00**	**0.00**	**0.00**	**0.00**	**71.06**	**10.05**	**0.70**	**0.10**	**8.63**	**1.35**	**0.52**	**0.08**

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a/ All data derived from Stantec-based GIS layers.

b/ Includes mapped and unmapped LSR on NFS lands.

c/ Riparian Reserve acres overlap with LSR and matrix land allocations.

TABLE 2-66

Riparian Reserve Effects Spencer Creek Fifth-Field Watershed HUC 1801020601

Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	**Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres)**														Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats c/	Gross Riparian Reserves	Fish Bearing	Anadromy d/
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80+)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40)	Stream Channel or Wetland Area	Net Riparian Reserve Cleared						
Buck Lake Subwatershed HUC 180102060102																												
WNF	168.31	ASI161	RR of lateral stream clipped	I	No	0.00		Yes				**0.00**				**0.00**		0.20		**0.20**		**0.20**		**0.20**	0.17	0.37	No	No
WNF	171.06	Spencer Creek EW085	Wetland swale, culverted under road	W	Yes	154.82	0.26	No				**0.00**				**0.00**				**0.00**		**0.00**		**0.00**		0.00	No	No
WNF	171.06	Trib. to Spencer Cr and wetland EW085	small intermittent stream with associated wetland culverted under road	I	Yes	4.05		No	0.34			**0.34**	0.57			**0.57**			0.17	**0.17**	0.29	**1.37**		**1.37**	0.18	1.55	No	No
WNF	171.35	AW184	Large wetland complex south of Clover Creek Rd.	W	No	0.00	0.00	Yes	0.67			**0.67**				**0.00**				**0.00**		**0.67**		**0.67**		0.67	No	No
WNF	171.57	Trib. to Spencer Cr.	2' wide stream that fans out into a wetland/stream complex. (Incorrectly classified as a perennial stream)	I	Yes	4.05		No				**0.00**				**0.00**		0.33		**0.33**		**0.33**		**0.33**		0.33	No	No
WNF	172.03	GW008	Spiraea wetland	W	No	0.00	0.00	Yes	0.23			**0.23**				**0.00**				**0.00**		**0.23**		**0.23**		0.23	No	No
WNF	172.45	EW105	Adjacent to EW107 (Acres of RR included in EW 107)	W	Yes	0.00	0.16	No				**0.00**				**0.00**				**0.00**		**0.00**		**0.00**		0.00	No	No
WNF	172.48	Trib. to Spencer Creek EW107 and wetland EW 105	Wetland/Stream	I	Yes	64.25		No	0.94			**0.94**				**0.00**				**0.00**	0.16	**1.10**		**1.10**		1.10	No	No
Subtotal Buck Creek Subwatershed		**Crossed:** **3 Int. Channel RR** **2 Wetland RR**	**Clipped:** **1 Int. Channel RR** **2 Wetland RR**	**8**	**5**		**0.42**	**3**	**2.18**	**0.00**	**0.00**	**2.18**	**0.57**	**0.00**	**0.00**	**0.57**	**0.00**	**0.53**	**0.17**	**0.70**	**0.45**	**3.90**	**0.00**	**3.90**	**0.35**	**4.25**		

TABLE 2-66

Riparian Reserve Effects Spencer Creek Fifth-Field Watershed HUC 1801020601

Jurisdiction	MP	Waterbody	Description	Waterbody Type	Crossed a/	Width of Crossing (feet)	Wetland Acres Crossed	Clipped b/	Riparian Reserve Vegetation Cleared in Construction Corridor and TEWAs by Age Class (Acres)														Uncleared Storage Area in RR	Total Direct Impact in RR (Cleared plus UCSA)	Roads and Other Altered Habitats c/	Gross Riparian Reserves	Fish Bearing	Anadromy d/
									RR_Conifer_LSOG	RR_Hardwood_LSOG	RR_Mixed_Conifer_Hardwood_LSOG	Total_LSOG (80+)	RR_Conifer_MS	RR_Hardwood_MS	RR_Mixed Conifer Hardwood MS	Total Mid-Seral (40-80)	RR_Conifer_ES	RR_Shrub_ES	RR_Grasslands	Total Early Seral (0-40)	Stream Channel or Wetland Area	Net Riparian Reserve Cleared						
Upper Spencer Creek Subwatershed HUC 180102060104																												
WNF	173.35	Trib to Spencer Creek	RR of lateral stream clipped	I	No			Yes	1.32			**1.32**				**0.00**				**0.00**		**1.32**		**1.32**		1.32	No	No
WNF	173.68	Trib to Spencer Creek	RR of lateral stream clipped	I	No			Yes				**0.00**	0.40			**0.40**				**0.00**		**0.40**		**0.40**		0.40	No	No
WNF	173.74	ESI106aTrib. to Spencer Creek	4' wide, snowmelt intermittent l stream	I	Yes	8.17		No				**0.00**	0.83			**0.83**				**0.00**		**0.83**	0.08	**0.91**	0.02	0.93	No	No
WNF	173.84	Trib to Spencer Creek	RR of lateral stream clipped	I	No			Yes				**0.00**	0.50			**0.50**				**0.00**		**0.50**		**0.50**	0.35	0.85	No	No
Subtotal Upper Spencer Creek Subwatershed		**Crossed:** **1 Int. Channel**	**Clipped:** **3 Int. Channel RR**	**4**	**2**			**3**	**3.23**	**0.00**	**0.00**	**3.23**	**1.73**	**0.00**	**0.00**	**1.73**	**0.00**	**0.00**	**0.17**	**0.17**	**0.03**	**5.16**	**0.08**	**5.24**	**0.47**	**5.71**	**1**	**0**
Total Spencer Creek		**Crossed:** **4 Int. Channels** **2 Wetlands**	**Clipped:** **4 Int. Channel RR** **2 Wetland RR**	**12**	**7**		**0.42**	**6**	**5.41**	**0.00**	**0.00**	**5.41**	**2.30**	**0.00**	**0.00**	**2.30**	**0.00**	**0.53**	**0.00**	**0.87**	**0.48**	**9.06**	**0.08**	**9.14**	**0.82**	**9.96**	**1**	**0**

a/ "Crossed" indicates that the pipeline trench crosses the waterbody or wetland.

b/ "Clipped" indicates that the pipeline corridor crosses a portion of the Riparian Reserve, but the pipeline trench does not cross the associated waterbody.

c/ Roads and other altered habitats such as rock pits sometimes occur within Riparian Reserves. These features do not have riparian characteristics and are not considered as part of the Riparian Reserve vegetated area.

d/ "Anadromy" means that a stream contains anadromous fish or that it is a tributary that directly influences an anadromous stream.

TABLE 2-67

Stream Crossing Turbidity and Crossing Risk Assessment

Fifth-Field Watershed	**Sixth Field Subwatershed**	**MP**	**Type a/**	**Description a/**	**Bankfull Width (ft) b/**	**Width of Crossing (ft) a/**	**Channel Gradient (%) b/**	**Channel Incision (ft) b/**	**Bank Character b/**	**Streambed Material b/**	**Turbidity Rating c/**	**Site Response Rating d/**	**Construction Impact Rating d/**	**Overall Rating e/**
Spencer Creek	Buck Lake	171.06	I	Small, 10 feet wide stream associated with wetland swale	12	154.82	3.3	0.75	Erodible	silt	M	L	M	BLUE
Spencer Creek	Buck Lake	171.57	I	2' wide stream that fans out into a wetland/stream complex		4.05					L	I	I	BLUE
Spencer Creek	Buck Lake	172.45	I	Wetland/Stream	5	64.25	1.98		Highly erosion resistant	gravel	M	L	M	BLUE
Spencer Creek	Upper Spencer Cr.	173.74	I	4' wide, snowmelt ephemeral stream		8.17					I	I	I	BLUE

Sources:
a/ Table 2A-3a, Resource Report 2, Water Use and Quality, PCGP 2013
b/ Table A-2, Stream Crossing Risk Analysis, GeoEngineers 2011
c/ Table B-1, Turbidity, Nutrients and Water Quality Analysis, GeoEngineers 2011
d/ Table A-1, Stream Crossing Risk Analysis, GeoEngineers 2011
e/ Figure 4, Stream Crossing Risk Analysis, GeoEngineers 2011

Existing Conditions

Original Watershed Analysis Findings

The BLM prepared the watershed analysis for the Spencer Creek watershed in 1995 in consultation with the Forest Service, U.S. Environmental Protection Agency, and U.S. Fish and Wildlife Service. Watershed conditions are as follows:

- There are 290 miles of roads in the watershed on NFS and BLM lands, which equals approximately 4 miles per square mile. In most areas, this density exceeds the 1.5 miles per square mile recommendation of the Spencer Creek Coordinated Resource Management Plan and both Forest Service and BLM land management plans (BLM et al. 1995: 4-124), resulting in excess levels of sediment. There are 150 stream crossings and 23 miles of roads within 100 feet of stream channels in the watershed (BLM et al. 4-150). Roads and areas of compaction decrease soil productivity, prolong the vegetative recovery process, and increase runoff potential. Road densities also exceed the recommended level for several wildlife species of concern, including deer and elk.

- Road densities and harvest have reduced near-term LWD recruitment and streamside canopy closure in many areas. In addition, there has been an increase in the amount of solar radiation and stream warming due to a reduction in shade and an increase in sediment deposition.

- Spencer Creek and associated tributaries frequently do not meet State of Oregon Water Quality Standards for salmonid-bearing streams of the Klamath Basin. Spencer Creek may continue to exceed maximum summer water temperatures above 68°F (ODEQ Standard for redband trout streams) because the mainstem originates as outflow from a shallow wetland area (Buck Lake). Riparian disturbance and low-flow influenced diurnal fluctuations may be a major cause for not meeting State of Oregon Standards for temperature in Spencer Creek (BLM et al. 1995: ES-4).

- The exceedance of the temperature standard may be related to two major management changes in the watershed: increased disturbance of the riparian zone due to management practices and the draining and water diversion channeling of Buck Lake for livestock grazing (BLM et al. 1995: 4-143).

- The road system design in the Spencer Creek watershed has resulted in water being routed into the stream channel, possibly contributing to increases in peak flows (BLM et al.1995: ES-4).

- Three changes in habitat condition were determined to be chronic and problematic for native fish in Spencer Creek: fine sediment, high temperature, and low flows. The significant causal mechanisms for reduced habitat quality are road crossings, streamside timber harvest, and channelization and grazing at Buck Lake (BLM et al. 1995: ES-4).

- Fire suppression has removed the natural disturbance regimes that would have acted to create openings and increase LWD input rates (BLM et al.1995 4-158).

- Twenty-five percent of the federal land within the Spencer Creek watershed is late successional forest and 29% is mid-seral stage forest.(BLM et al.1995 4-86).

Changes in watershed Condition

The following projects responsive to the recommendations in the Spencer Creek watershed analysis have been completed by the Forest Service (table 2-68).

TABLE 2-68

Changes in Watershed Condition since publication of the Spencer Creek Watershed Analysis

Project Name	Administrative Unit	Treatments Completed
Lakewoods WUI	Klamath RD, Winema NF	**Purpose:** Recreation management, vegetation management (other than forest products), fuels management, special use management **Activities:** Forest vegetation improvements, fuel treatments (non-activity fuels), fuels thinning/piling/burning.
Spencer Creek Fences	Klamath RD, Winema NF	**Purpose:** Wildlife, fish, rare plants, grazing management. **Activities:** Species habitat improvements, grazing structural improvements.
Spencer Creek Fence Project – Part II	Klamath RD, Winema NF	**Purpose:** Wildlife, fish, rare plants, grazing management. **Activities:** Species habitat improvements, grazing structural improvements.
Clover Creek Fish Passage Culvert	Klamath RD, Winema NF	**Activities:** Replace undersized culvert on through fill with arch fish passage culvert. T38S R5E Sec. 3 SE/SE (Keno Access Road)
Spencer Creek Fish Passage	Klamath RD, Winema NF	**Activities:** Removed two channel spanning rock check dams set by dispersed recreation users to restore fish passage at the Spencer Creek dispersed camping site at outlet of Buck Meadows.
Spencer Creek Dispersed Campground	Klamath RD, Winema NF	**Activities:** Large section of the campground immediately adjacent to Spencer Creek was closed to vehicle access with boulder barriers allowing bar, compacted areas to fully revegetate. Dispersed camping area was fenced to exclude cattle from Buck-Indian Allotment, allowing area to revegetate.
Fremont-Winema National Forests Motorized Travel Management Project Environmental Assessment	Klamath RD, Winema NF	The decision applies to all NFS lands managed by the Forest, including the Spencer Creek watershed. Result of the decision is to improve water quality by reducing impacts from existing roads.

Current Watershed Conditions

Spencer Creek is Clean Water Act section 303(d) listed by the State of Oregon for biological criteria, sedimentation, and temperature (ODEQ 2010 database). Ongoing restoration efforts in Spencer Creek have improved watershed conditions at the locations where those projects occurred; however, the issues of fine-grained sediment and stream temperature described in the watershed assessment remain valid. This is reflected in the Forest Service Condition Class Rating for the Buck Creek subwatershed that states it is “functioning at risk.” Water quality ratings were “not properly functioning” (see attachments: section 3.3.2). Spencer Creek is highly productive spawning and rearing habitat for rainbow/redband trout despite the temperature and fine-grained sediment issues. Spencer Creek temperatures are low during spring (<15°C) and are generally below 18°C, but can exceed 20°C for extended periods of time during summer months (Reclamation 2013). Aquatic and riparian monitoring as part of the NWFP noted improving watershed condition trends in all of the subwatersheds of Spencer Creek (see attachment: section 3.3.3).

Natural Disturbance Processes

Disturbance processes for the Spencer Creek watershed are consistent with those described for the High Cascades Province in section 2.1.4. The disturbance agent that had the most historic influence on ecosystems within the mixed conifer and ponderosa pine zone was fire (Agee 1993, cited in BLM et al. 1995). Studies cited in the Spencer Creek watershed analysis found an average fire-return interval that probably ranged from 10 to 60 years. Fires tended to be frequent and of moderate to low intensity, which created a mosaic of burned and unburned areas.

Both Native American and lightning ignitions were important sources of fire. Native Americans burned these forests regularly and altered the successional development of the vegetative communities. Within both the mixed-conifer and ponderosa pine zone, the intensity of these historic fires was usually low because the frequent fires repeatedly removed understory ladder fuels and consumed the forest floor fuels.

Within the Spencer Creek watershed, historic insect epidemics from bark beetles (*Dendroctunus* spp., *Ips* spp., and *Scolytus ventralis*) moderately influenced the forests within this zone. Root rots and diseases (*Heterobasidion annosum*, *Armillaria ostoyae*, and *Leptographium wageneri*; blackstain) likely caused small-scale disturbances within the watershed in this zone (Scharpf 1993). Indian paint fungus (*Echinodontium tinctorium*) was also an important small-scale disturbance within this zone. No significant windthrow events are known to have occurred within the watershed, except for minor events involving a small number of trees.

Most precipitation falls as snow in the Spencer Creek watershed, and snowmelt dominates the hydrograph. In most years, snow melts slowly and percolates into the soil without generating peak discharge events. Warm spring rains can add to snowmelt peaks and, on average, do so two or three years out of every ten (BLM et al., 1995). Though rare, high-intensity rain-on-snow events do occur in the Spencer Creek watershed and can generate large peak flows. Historically, Buck Lake buffered these flows to some degree.

During large, infrequent peak flow events, the stream spreads out in overflow channels or is directed toward the upper banks under bankfull conditions, resulting in high erosion rates. Geomorphically, these processes form a pool riffle structure in this fluvial system. Due to the high gradient, the frequency of pool-riffle sequencing was approximately three to seven channel widths, increasing in frequency with a higher gradient. LWD was a major factor in the quantity of pools. LWD deposits also created pools upstream and slowed velocity, allowing for the deposition of gravels. Beaver dams also helped to create this pool-riffle structure. Both of these features create areas of sediment deposition.

The amount and proportion of fine-grained sediments entering Spencer Creek and floodplain areas is low in recent geologic time. The wetland at Buck Lake, floodplains, LWD, beaver dams, and pools all functioned to capture and store fine-grained sediments. Therefore, the quantity and quality of productive spawning gravels was high. Well-sorted bedload sediments contributed to a diverse and resilient macroinvertebrate community (BLM et al. 1995: 156). Geomorphically over recent geologic time, water quality in the Spencer Creek watershed was likely high. Water quantity was more likely a limiting factor for salmonids and other aquatic biota.

Project Effects and Natural Range of Variability

There are two areas of concern related to the effects of the project in the Spencer Creek watershed based on the Spencer Creek watershed analysis, including whether those effects would be outside the range of natural variability for affected resources in the watershed.

1. Whether the clearing for the project would cause excessive erosion and sediment deposition that would adversely impact any of the affected streams. Sediment levels throughout the Spencer Creek system are limiting and excess or chronic fine-grained sediment deposition in streams is a significant cause for concern.

GeoEngineers completed a stream crossing turbidity, construction risk, and site response analysis (see section 1.3). Evaluations for stream channel crossings in the Spencer Creek watershed are summarized in table 2-67. BMPs that would be applied at each crossing, grouped by "blue" (low risk) and "yellow" (moderate risk) construction impact risk ratings are shown in table 2-68. All of the crossings in Spencer Creek are rated as "blue" or at low risk for construction impacts.

All stream crossings on NFS lands in the Spencer Creek watershed are intermittent, snow-melt-driven streams. BMPs from the "blue" category in table 2-68 would be applied at these channel crossings. The upper three crossings (MP 171.06, 171.57, 172.48) drain into wetland features directly below the Spencer Creek road, or into the large Buck Lake complex of channels. The lower crossing (MP 173.74) is an intermittent tributary of Spencer Creek.

In all crossings:

- Silt fencing would be installed and maintained until effective ground cover is reestablished. Silt fences are greater than 90% efficient at trapping silt (Robichaud et al. 2000).
- Effective ground cover would be in place prior to the onset of seasonal precipitation (table 2-69).
- Rapid reestablishment of vegetation would be emphasized.

These are all proven and effective erosion control and water quality BMPs. The measures are expected to be effective based on site-specific evaluations and field reviews (GeoEngineers 2011). Sediment impacts from the project are expected to be minor, short-term, and consistent with the evaluation in section 1.3.1. Long-term adverse consequences to water quality from soil erosion are not expected to occur due to effective ground cover (table 2-14); implementation of the ECRP, which includes revegetation of disturbed areas; and installation of waterbars to disperse water.

While on-site erosion control measures are expected to be effective, the presence of wetland features below three of the crossings (MP 171.06, 171.57, 172.48) provide additional backup for filtering of any fine sediment that may enter stream systems from these crossings.

2: Whether removal of effective shade may increase water temperatures in streams.

There are four stream crossings on NFS lands in the Spencer Creek watershed where Riparian Reserve vegetation would be cleared. All are intermittent channels. Channel crossings of intermittent streams are not expected to affect water temperatures because these streams would likely be dry or become discontinuous by the time that warmer water temperatures become an issue in late summer (see section 1.3.1.3).

Pacific Connector used predictive modeling on a representative cross-section of crossings along the project route, spanning the ecoregions, HUCs, width classes, and aspect classes present from Coos Bay to Malin, Oregon, including stream crossings on NFS lands. Model results show a maximum predicted increase of 0.16°C over one 75-foot clearing. Thermal recovery analysis shows that temperatures return to ambient within a maximum distance of 25 feet downstream of the project right-of-way, based on removal of existing riparian vegetation over a cleared right-of-way width of 75 feet. These findings are consistent with NSR 2009. Pacific Connector also assessed the cumulative impact of right-of-way clearing on stream temperatures. The project cumulative effects to the thermal regime in the Coos, Coquille, South Umpqua, Rogue, Klamath, and Lost River basins is expected to be exceptionally minor and well below detection in the field, given that mitigation for loss of effective shade would occur and that predictive modeling using SSTEMP shows that the local impacts are small in magnitude and spatially limited, (GeoEngineers 2013f: 26).

Table 2-70 shows the predicted project effects and relevant ecological processes in Spencer Creek.

TABLE 2-69

Pacific Connector Proposed BMPs for Use at Waterbody Crossings in the Spencer Creek Watershed

	Best Management Practices for Project Typical “Blue” Crossings and for All Other Crossings.	**Best Management Practices for Moderate Risk “Yellow” Crossings**	**Best Management Practices for High Habitat Risk “Green” Crossings**
Crossing MP	**171.06, 171.57, 172.45, 173.74**	None	None
Streambed	• Dry ditch crossings (5) • Backfill to match existing streambed gradation, composition as much as possible • Profile restored to existing profile and grade • Stratified backfill for fish-bearing streams	• Dry ditch crossings (5) • Backfill with native material (3, 4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1) • Structural fill placement (2)	• Dry ditch crossings (5) • Backfill with native material (3, 4) • Backfill to match existing streambed gradation, composition as much as possible (4) • Profile restored to existing profile and grade (4) • Stratified backfill for fish-bearing streams (1)
Streambanks	• Revegetation with native plant materials (3, 4, 6) • Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment • Widened riparian corridor (federal lands, willing landowners) (3, 6) • Use of fast-growing native tree species to accelerate shading) • Placement of large wood and boulders where appropriate • Maintenance of effective cover	• Typical erosion and sediment control BMPs including erosion control blankets, silt fences, etc. • Narrowed construction disturbance (75 feet) corridor where feasible (2, 3, 4) • Narrowed permanent management corridor (2, 3, 4) • Revegetation with native plant materials (3, 4, 6) • Bank graded/terraced to 3:1 (2, 3) • Geotextile reinforced slope (5) • Fiber rolls (3) • Stream barbs/flow deflectors (5) • Toe rock placement (3) • Riprap placement (3) • Biotechnical “vegetation” riprap (3) • Tree revetments (3)	• Typical erosion and sediment control BMPs including erosion control blankets, silt fences, etc. • Narrowed construction disturbance (75 feet) corridor where feasible (2, 3, 4) • Narrowed permanent management corridor (2, 3, 4) • Revegetation with native plant materials (3, 4, 6) **Additional Measures** • Rootwad enhancement of bank stabilization

TABLE 2-69

Pacific Connector Proposed BMPs for Use at Waterbody Crossings in the Spencer Creek Watershed

	Best Management Practices for Project Typical "Blue" Crossings and for All Other Crossings.	**Best Management Practices for Moderate Risk "Yellow" Crossings**	**Best Management Practices for High Habitat Risk "Green" Crossings**
Riparian Vegetation	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (federal lands) (3, 6) • Use of fast-growing native tree species to accelerate shading (3)	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees (3) • Widened riparian corridor (federal lands) (3, 6) • Use of fast-growing native tree species to accelerate shading (3)	• Revegetation with native trees to within 15 feet of the pipeline parallel to the alignment (1, 3, 5, 6) • Revegetation with native woody riparian shrubs and trees for willing landowners (3) • Widened riparian corridor (federal lands, willing landowners) (3, 6) • Use of fast-growing native tree species to accelerate shading (3) **Additional Measures** • Emphasis on prevention and monitoring for invasive weeds and weed control during revegetation establishment.
Aquatic Habitat	• Stratified backfill for fish-bearing streams (1,2, 4, 6) • Placement of large wood where appropriate (2, 4, 6)	• Stratified backfill for fish-bearing streams (1,2,4, 6) • Placement of large wood where appropriate (2, 4, 6)	• Stratified backfill for fish-bearing streams (1, 2, 4, 6) • Placement of large wood where appropriate (2, 4, 6) **Additional Measures** • Rootwad enhancement of bank stabilization
BMP Source	1. FERC Guidelines 2. FEIS chapter 2, Project Description 3. POD attachment, ECRP 4. POD attachment Wetland and Waterbody Crossing 5. POD attachment, ECRP 6. POD attachment Compensatory Mitigation Plan		

TABLE 2-70

Project Effects and Relevant Ecological Processes Described in the Spencer Creek Fifth-Field Watershed Assessment

Ecological Processes Relevant to the Project	Historic Range of Variability	Pacific Connector Effects
Erosional Processes	The Spencer Creek watershed is within the High Cascades Province, which includes a pumice soils landscape with high infiltration rates. Erosional processes in the watershed are dominated by spring snowmelt. Landform processes such as landslides, debris flows, and rill and gully erosion are, for the most part, rare and isolated on steep slopes of Aspen Butte, Mt. Carmine, and Crater Mt. (BLM et al.1995, p. 4-157). Warm spring rains may occasionally (2-3 years out of 10) cause accelerated snowmelt and higher flows, but these rarely result in channel forming events. Infrequent high-intensity rain-on-snow peak flow events caused pulses of sediments, primarily from bank erosion that created complex pool and riffle aquatic environments. Beaver dams/pools and large wetland complexes (e.g., Buck Lake) created sinks that trapped fine sediments. These processes in the watershed have been altered primarily by roads, which serve as a chronic source of fine-grained sediment. Also, draining Buck Lake and irrigation/drainage ditch maintenance contribute sediment. Erosion from timber harvest and skid trails have little effect on channel conditions (BLM et al.1995, p. 4-153)	The project does not cross any steep slopes that are prone to landslide or gully erosion. The project location in the Spencer Creek watershed is all on gentler landscapes where water tends to percolate into the ground. On these terrains, hillslope roughness is sufficient to slow water velocity, causing any mobilized sediment to "drop out" before reaching streams (BLM et al. 1995, p. 4-153). Erosion control measures are expected to be effective in minimizing sediment sources and transport. Any effects of the project are expected to be within the range of natural variation for the Spencer Creek watershed.
Ecological Succession/ Vegetative Condition	Historically, the Spencer Creek watershed had a high frequency of fire occurrence that created a complex mosaic of stands that had an open stand structure. Large, high-intensity fires were rare.	The project affects 91.72 acres (0.41%) of NFS lands in the Spencer Creek watershed (table 2-64). Approximately 8.63 acres of Riparian Reserve vegetation would be cleared on NFS lands (table 2-65), which accounts for 0.04% of the total NFS lands in the watershed. Of this amount, approximately 4.58 acres are LSOG forest. The clearing of LSOG and mid-seral vegetation are long-term changes in vegetative condition. Given its fire history (see section 2.6.1.3), this is well within the range of natural variability for the Spencer Creek watershed.
Flow Regime	Flow regimes in the Spencer Creek watershed were largely driven by the snowmelt cycle, and less so by changes in vegetation associated with fires because fires were frequent and of low to moderate intensity. Large wetland features buffered minor changes in flows.	The project affects 0.41% on NFS lands and 0.38% of all lands in the watershed (table 2-66). Given the vegetation mosaic in the watershed, the high infiltration rates of soils, the large buffering capacity provided by adjacent wetlands, and the small proportion of the watershed affected by the project, it is highly unlikely that the project would alter flow regimes in any way. See also FEIS section 4.4.

TABLE 2-70

Project Effects and Relevant Ecological Processes Described in the Spencer Creek Fifth-Field Watershed Assessment

Ecological Processes Relevant to the Project	Historic Range of Variability	Pacific Connector Effects
Stream Temperature	The aspect of the perennial portion of Spencer Creek is primarily southeast. This exposure provides high incidence of solar radiation compared to many drainages in the High Cascades Province, which tend to run east or west. This makes this portion of the stream channel susceptible to increases in water temperatures from loss of shade. Buck Lake likely caused some warming from increased solar radiation. Historic tree composition and valley form indicate that approximately 75% of the perennial streams (excluding Buck Lake) probably had 40 to 70% canopy closure. The remaining 25%, areas with broad flood plains and meadows, is presumed to have had a mixture of cottonwoods, willows, and scattered lodgepole pine patches. Water temperatures in these reaches were probably never in excess of levels considered detrimental to fish populations. Areas susceptible to very low flows were probably subject to short-term high temperatures and high diurnal fluctuations in water temperature (BLM et al. 1995: 4-155). Stream temperatures have been altered primarily by shade removal associated with roads and timber harvest and by changes in channel morphology that have resulted in high width-to-depth ratios and a lack of large wood. Spencer Creek is currently section 303(d) listed for water temperature.	There are four intermittent stream crossings in the Spencer Creek watershed where Riparian Reserve vegetation would be cleared. Channel crossings of intermittent streams are not expected to affect water temperatures because these streams would likely be dry or become discontinuous by the time that warmer water temperatures become an issue in late summer (see section 1.3.1.3). Also, the upper three crossings (MP 171.16, 171.57, and 172.45) drain into the Buck Lake wetland complex, where exposure to solar radiation would mask any temperature increase.
Aquatic Habitat and Stream Channel Complexity	Channel complexity in Spencer Creek was likely high because of LWD present in stream channels and beaver activity. Channel structure was sinuous, with high pool to riffle ratios and gravels that were relatively free of fine-grained sediments.	During construction, the project would alter the bed and banks of stream channels and move LWD and boulders as necessary for construction. After construction, these sites would be restored to their preconstruction condition and stabilized as needed by placement of boulders, LWD, and erosion control structures as specified in the ECRP and Wetland and Waterbody Plan; therefore, no long-term effects to aquatic habitat and channel complexity are expected. Effects would be limited to the project scale and would be minor and short-term (typically 1 to 2 days per crossing).

Compliance with Winema National Forest LRMP Standards and Guidelines

Table 2-71 describes Winema National Forest LRMP Standards and Guidelines relevant to the ACS and the project's compliance with this management direction in the Spencer Creek watershed.

TABLE 2-71

Compliance with Winema National Forest LRMP Standards and Guidelines in the Spencer Creek Watershed

LRMP Standard/Guideline	**Project Compliance**
LH-4: Riparian Reserves	Terms and conditions to ensure compliance with ACS objectives have been incorporated into the POD prepared by the applicant in conjunction with the BLM, Forest Service, and Reclamation and submitted as part of the Right-of-Way Grant application. The POD includes 28 exhibits including the Wetland and Waterbody Crossing Plan, the Erosion Control and Revegetation Plan, the Hydrostatic Test Plan, the right-of-way Clearing Plan, the TMP, etc.
RA-4: Riparian Reserves - General Riparian Area Management	Pacific Connector has developed a Hydrostatic Test Plan (see the POD) that would minimize any potential short-term effects on stream flows from water discharge events from the project's hydrostatic testing operations. No potential hydrostatic test water sources occur within the Spencer Creek watershed; therefore, the biological, physical, and chemical integrity of these systems would remain unaffected from hydrostatic withdrawal activities.
RF-2: Riparian Reserves - Road Management	The existing transportation system in the Spencer Creek watershed would be adequate for construction of the project. No new temporary or permanent access roads are planned in the Spencer Creek watershed.
RF-4: Riparian Reserves - Road Management	No new road crossings of streams are proposed in the watershed. Crossings would be maintained to prevent diversions. Specific specifications in TMP section 2.2.3 and Exhibit F, section F.9.e require culvert and bridge replacements to meet agency standards and agency approval of plans.
RF-5: Riparian Reserves - Road Management	Road maintenance specifications in the TMP require implementation of T-831, T-842, T-811, and T-834, which are maintenance specifications designed to minimize sediment delivery to aquatic habitats, would be implemented during project construction. Several road decommissionings are proposed in the Spencer Creek watershed. These are expected to reduce sediment delivery from roads, in some places significantly.
RF-6: Riparian Reserves - Road Management	Fish passage would be maintained at all road crossings where project-related road repairs are implemented.
RF-7: Riparian Reserves - Road Management	The TMP submitted by the applicant and accepted by the Forest Service meets all of the requirements of RF-7.
WR-3: Riparian Reserves - Watershed and Habitat Restoration	Application of BMPs and aggressive erosion control measures, restricted construction windows, and numerous other impact minimization measures have been incorporated into several exhibits to the POD to prevent habitat degradation. These measures are not being used as a substitute for otherwise preventable habitat degradation or as surrogates for habitat protection.
Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth-field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15% or less late-successional forest. (The assessment of 15% will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands.	Federal lands in the Spencer Creek watershed are currently 26% LSOG and exceed this threshold.
FS 1. Management Recommendations for Survey and Manage Species. Management direction for Survey and Manage Species in the NWFP ROD was replaced by the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines as Modified by the 2011 Settlement Agreement in Conservation Northwest v. Sherman, Case No. 08-CV-1067-JCC (W.D. Wash.).	The project affects Survey and Manage species within the Spencer Creek watershed. However, the project does not threaten the persistence of any Survey and Manage species (see appendix F.5). Regardless, this is inconsistent with the land management plan for the Forest Service and an amendment to the plan is required. Waiving application of Management Recommendations for Survey and Manage species in the watershed would not prevent attainment of any ACS objective.

TABLE 2-71

Compliance with Winema National Forest LRMP Standards and Guidelines in the Spencer Creek Watershed

LRMP Standard/Guideline	**Project Compliance**
WNF 4 - The forest wide general Standard and Guideline requires detrimental soil conditions not exceed 20% of the total acres within the activity area (LRMP, page 4-73).	The project cannot meet this standard, and an amendment of the Winema National Forest LRMP is needed. This amendment allows the project to exceed restrictions on detrimental soil conditions from displacement and compaction on an estimated 30 acres within the project right-of-way. Detrimental soil conditions occur when soil is compacted, puddled, displaced over an area greater than 100 square feet, or is severely burned.
WNF 5 - Management Area 8 – Riparian Areas requires the cumulative total area of detrimental soil conditions in riparian areas shall not exceed 10% of the total riparian acreage within an activity area (LRMP, page 4-137).	The project cannot meet this standard. This amendment allows the project to exceed restrictions on detrimental soil conditions from displacement and compaction on an estimated 4 acres within the project right-of-way that lies within Management Area 8 Riparian Area. Detrimental soil conditions occur when soil is compacted, puddled, displaced over an area greater than 100 square feet, or is severely burned.

Compliance with Standards and Guidelines for Key Watersheds

The Spencer Creek watershed was delineated as a Tier 1 Key Watershed in the NWFP. Applicable Standards and Guidelines for Key Watersheds and the project's consistency are shown in table 2-72.

TABLE 2-72

Standards and Guidelines for Key Watersheds

Standard and Guideline	**PCPG Consistency**	**Mitigation Plan**
Reduce existing system and nonsystem road mileage, with no net increase in road miles	No new roads would be constructed by Pacific Connector. The project right-of-way would be obliterated after construction.	Decommissioning of approximately 29.22 miles of road on NFS lands would result in a net decrease of road miles and reduce road density in the Tier 1 Key Watershed.
No new roads would be constructed in inventoried Roadless Areas.	No part of the project is in an inventoried Roadless Area.	None
Watershed Analysis/Assessment must be completed prior to management activities.	Watershed Analysis/Assessment has been completed for all watersheds crossed by the project on NFS lands.	Off-site mitigation measures are consistent with watershed analysis recommendations

Relationship of Proposed Forest Service LRMP Amendments to the ACS

The Winema National Forest LRMP contains Standards and Guidelines that cannot be met by the project. Two of these Standards and Guidelines have a nexus with the ACS because they provide protection for aquatic resources that are more restrictive than the NWFP. Site-specific amendments of these standards and guidelines are proposed to make provision for the project. This discussion addresses whether those plan amendments would prevent attainment of the ACS.

WNF-4 and WNF-5: Amendments to Detrimental Soil Standards

These Standards and Guidelines restrict the amount of an area that may be in a degraded soil condition as a result of a management activity. They are considered together here because the assessment is the same for both standards.

> The forest-wide general Standard and Guideline requires that detrimental soil conditions not exceed 20% of the total acres within the activity area (LRMP, page 4-73), and Management Area 8 – Riparian Areas requires the cumulative total area of detrimental soil conditions in riparian areas shall not exceed 10% of the total riparian acreage within an activity area (LRMP, page 4-137). Detrimental soil conditions occur when soil is compacted, puddled, displaced over an area greater than 100 square feet, or is severely burned.

Degraded soil conditions may occur in cleared project areas. On NFS lands in the Spencer Creek watershed, approximately 87% (80 acres) of the project right-of-way would be cleared. Degraded soil conditions may result from displacement and compaction following completion of project construction and rehabilitation. Compaction can be addressed by subsoil ripping, but displacement would be unavoidable because of the nature of the project. Existing LRMP Standards and Guidelines allow up to 10% (9 acres) of the project right-of-way in MA-8 Riparian Areas or 20% (18 acres) in the project right-of-way outside of MA-8 to be in a degraded soil condition on completion of a project. Thus, the proposed amendment allows an estimated additional 62 or 71 acres (0.27 or 0.32% of NFS lands in the Spencer Creek watershed) to be in a degraded soil condition on completion of the project.

Without rehabilitation, severe disturbances such as soil mixing or displacement would reduce long-term site productivity by displacing the duff layer and soil surface (i.e., A horizon), thus reducing the soil's ability to capture and retain water and nutrients. As a result, sites with long-term detrimental soil conditions may have interrupted hydrologic function and poor site productivity. Compacted and/or displaced soils may increase runoff and sediment transport and have lower rates of vegetative recovery.

Environmental consequences associated with 62 or 71 acres (about 0.27 or 0.32% of NFS lands in the watershed) of additional detrimental soil conditions include:

- **A potential increase in sediment mobilization.** The following measures have been incorporated into the project design or mitigation plans to limit sediment mobilization and transport.

    - The project alignment was selected to avoid areas with high geologic hazards. No landslides have been identified that pose a threat to the project. The project does not cross unstable earthflow terrains identified in the Spencer Creek watershed.

    - Effective erosion control measures and BMPs are required as shown in the ECRP (see section 1.3 for a discussion of erosion control measures). Additionally, the project would comply with LRMP Standards and Guidelines for maintenance of effective ground cover (see section 1.3.1.2).

    - The Spencer Creek watershed analysis documented that skid trails and harvest units rarely contribute sediment to channels because the roughened soil surface and inherently high infiltration rates limit sediment transport (BLM et al. 1995: 4-153). The project right-of-way, upon completion, would have conditions similar to a harvest unit; therefore, similar results would be expected.

  - Offsite mitigation measures that would help to offset these effects on NFS lands in the Spencer Creek watershed include approximately 29.22 miles of road decommissioning. Assuming a 14-foot average road width, 29.22 miles of proposed road-decommissioning would reduce compaction and revegetate approximately 50 acres that are currently native road surfaces in the Spencer Creek watershed. This action substantially offsets any areas that may remain in a detrimental soil condition (an estimated 20 to 57 acres) in the project right-of-way.

  - Any sediment impacts from detrimental soil conditions are expected to be minor and short-term as a result of the dispersal of effects by the linear nature of the project, maintenance of effective ground cover, the required application of BMPs, minimal stream crossings, and application of offsite mitigation measures. Amending the LRMP is unlikely to exceed the soil disturbance thresholds on 62 or 71 acres that would result in the mobilization of sediment that would prevent attainment of ACS objectives in the Spencer Creek watershed.

- **A potential localized increase in peak flows.** Changes in vegetation from fires, altering wetland functions, clearing vegetation, and roads are known to affect peak flows. Loss of wetland functions and roads were identified in the Spencer Creek watershed analysis as the primary factors affecting peak flows. Changes in vegetation from timber harvest appear to have little effect on peak flow processes (BLM et al. 1995: 4-147). The project as a whole affects about 91.72 acres or 0.41% of the NFS lands in the Spencer Creek watershed. Detrimental soil conditions are likely to exist on 80 acres or about 0.35% of NFS lands in the watershed. These effects would be spread over 6 miles of corridor in two separate subwatersheds. It is unlikely there would be any change in peak flows as a result of construction of the project or detrimental soil conditions given the snowmelt-driven hydrograph and high soil infiltration rates in the watershed.

  It is unlikely that amending the forest plan to allow detrimental soil conditions on an additional 62 or 71 acres would result in any change in flows that would prevent attainment of ACS objectives.

- **A potential loss of site productivity, which may slow vegetative recovery.** Soils derived from High Cascades volcanic units may be low in productivity. Mechanically decompacting the soil to a minimum depth of 20 inches and reestablishing soil organic matter would be a critical first step in rehabilitating the soil toward a more natural condition. Soil rehabilitation would also require recovery of the soil biology, which requires restoration of the soil organic matter and time. Project mitigation measures would be used to decompact the project right-of-way, fertilize disturbed areas, reestablish native vegetation (by limiting the area directly over the pipe to grasses and shrubs), and scatter slash and LWD back across the site to provide for long-term nutrient cycling as required in the ECRP. Any loss of soil productivity would be widely dispersed in the project right-of-way. Additionally, decommissioning 29.22 miles of roads (estimated to be 50 acres of running surface) on NFS lands would contribute to offsetting any loss of soil productivity by restoring vegetative cover and organic material and reestablishing drainage on currently bare and compacted soils.

Slash and LWD would be scattered back across the project right-of-way to provide organic material on completion of the constructive phase. In areas where revegetation may be difficult because of soil conditions, the Forest Service would require soil remediation with wood chips to reestablish soil productivity.

In conclusion, amendments WNF-4 (Detrimental Soil Conditions) and WNF-5 (Detrimental Soil Conditions in Riparian Areas) have allowed minor effects at the site scale. It is unlikely that those effects would prevent attainment of ACS objectives in the Spencer Creek watershed.

Off-Site Mitigation Measures on NFS Lands and BLM lands

Offsite mitigation is to provide supplemental actions for projects that cannot be completely mitigated with on-site design features in order to ensure land management plan objectives are achieved. These projects also contribute to the “Maintain and Restore” objectives of the ACS. BLM-administered lands are not subject to ACS requirements as a result of the August 2016 RODs for two new RMPs (BLM 2016a, 2016b) that supersede the RMPs amended by the 1994 NWFP ROD. The project proponent has offered voluntary mitigation that could be implemented on BLM lands within this watershed; these mitigation efforts would benefit ACS objectives within the watershed. Forest Service and BLM mitigation measures proposed for this watershed were developed in conjunction with the project proponent from the recommendations in watershed assessments, LSR assessments, and the 2011 Northern Spotted Owl Recovery Plan. The Forest Service, BLM, and Pacific Connector have entered into Agreements in Principle to accomplish off-site mitigation work in the Spencer Creek watershed as shown in table 2-73.

Mitigation measures were developed from the recommendations of watershed assessments, Late Successional Reserve Assessments, and the 2008 Northern Spotted Owl Recovery Plan. Proposed mitigation measures in the Spencer Creek watershed with a nexus to the ACS include:

- **LWD Instream.** Placement of LWD in streams adds structural complexity to fluvial systems by creating pools and riffles and trapping fine-grained sediments and can contribute to reductions in stream temperatures over time (Tippery, Jones et al. 2010). This is responsive to ACS objectives 2 through 5.

- **Road Decommissioning.** Decommissioning roads can substantially reduce sediment delivery to streams (Madej 2000; Keppeler, Cafferata et al. 2007). Proposed road decommissioning where the project impacts occur would reduce surface runoff, increase infiltration, and reduce sediment production from road-related surface erosion in the watershed. This mitigation is responsive to ACS objectives 2 through 5 and Standards and Guidelines for Key Watersheds (Forest Service and BLM 1994b: B-11, C-7).

- **Fish Passage/Culvert Replacement.** Old culverts may block fish passage either by poor design or by failure over time. Removing these blockages and replacing them with fish-friendly designs can allow fish and other aquatic organisms to access previously unavailable habitat. This is responsive to ACS objectives 1 through 3 and 9.

- **Stand Density Reduction.** Use of fuels reduction and stand density management are appropriate tools to reduce the risk of high-intensity, stand-replacing fires in these forests. Management activities that reduce the risk of natural disturbance adjacent to KOACs is also appropriate (Forest Service and BLM 1994b: C-11). Results of the Spencer Creek watershed analysis included recommendations for fuels reduction projects on most landscapes. Stand-density reductions in riparian zones have the dual benefit of reducing the risk of stand-replacing fire, while also accelerating the development of late successional stand conditions by accelerating growth of remaining trees. This is responsive to ACS objective 8 and 9.

TABLE 2-73

Proposed Offsite Mitigation Projects on NFS Lands and BLM Lands

Agency	Project Type	Project Name	Quantity	Unit	Project Rationale	Land Allocation
FS	Aquatic	Riparian Planting	0.5	Mile	This is a meadow site along a 0.5-mile reach of Spencer Creek just upstream of Buck Lake (T38S R5E section 11) that has lost streamside vegetation and has compacted soils. There is an overall need to restore health and vigor to riparian stands by maintaining and improving riparian reserve habitat. Shade provided by the plantings would contribute to moderating water temperatures in Spencer Creek. Root strength provided by new vegetation would increase bank stability, decrease erosion and sediment depositions to Spencer Creek, and provide habitat for species that use riparian habitats. This is responsive to ACS objectives 3, 4, 5, 8, and 9.	Riparian Reserves
FS	Aquatic	Spencer Creek LWD	1	Mile	Over the last century, a 1-mile reach of Spencer Creek (T38S R6E section 18) with high aquatic habitat potential has become simplified and, therefore, has a reduced capacity to provide quality habitat. Riparian stands have decreased health and vigor, resulting in increased time to develop large tree structure for wildlife, stream shade, and future instream wood. Placement of LWD in streams adds structural complexity to aquatic systems, traps fine sediments, and can contribute to reductions in stream temperatures over time (Tippery, Jones et al. 2010). The BLM completed placement of LWD last year on 3 miles of Spencer Creek below this reach. Addition of this segment would complete stream rehabilitation on the reach of Spencer Creek where the project occurs. Logs from the project right-of-way would be used for the project. An estimated 75 pieces are needed. A helicopter would be used to place the logs. This is responsive to ACS objectives 2, 3, 4, and 5.	Riparian Reserves
FS	Aquatic	Interpretive Sign	1	Project	Continued recreational dam building occurs at this location, resulting in negative impacts to stream morphology and riparian habitat impacting fish and the only known Upper Klamath Basin population of giant Pacific salamander. There is a need to educate the public as to the detrimental effects of this dam building action, and this would best be served by installation of an informational sign to reach those parties utilizing the site.	Riparian Reserves

TABLE 2-73

Proposed Offsite Mitigation Projects on NFS Lands and BLM Lands

Agency	Project Type	Project Name	Quantity	Unit	Project Rationale	Land Allocation
FS	Aquatic/ Terrestrial	Road Decommissioning	29.22	Miles	Reduction in road density is a central recommendation of the Spencer Creek Watershed Assessment. The objective of road decommissioning for this project is to reduce road density and accelerate the revegetation of the decommissioned roads with trees to reduce negative impacts of roads on wildlife habitat and aquatic environments. Some natural-surface roads have poor drainage that can lead to erosion and increased sediment in nearby streams (Trombulak and Frissell 2000). Road obliteration can improve drainage and reduce chronic sediment input to the stream systems (Madej 2000; Switalski, Bissonette et al. 2004; Tippery, Jones et al. 2010). This mitigation also offsets the impacts of soil compaction and displacement within the project right-of-way by reducing compaction in the decommissioned roadbeds. Table 2-74 and figure 2-18 compare miles of roads decommissioned with impacts of the project right-of-way on Riparian Reserves, acres in degraded soil condition, and number of stream crossings. Likely benefits of road decommissioning include increased infiltration of precipitation, reduced surface runoff, and reduced sediment production from surface erosion (Switalski, Bissonette et al. 2004). Where roads are decommissioned within riparian areas, riparian vegetation may be reestablished. Approximately 5.2 miles or 12.6 acres of proposed decommissioning occur within Riparian Reserves (table 2-74, figure 2-18). Approximately 29.22 miles of roads are currently open that can be decommissioned. Table 2-75 and figure 2-19 show the reduction in road density associated with implementation of the proposed mitigation plan. Road densities decrease at all scales with this mitigation. The greatest reductions in road density occur within ¼ mile of the project right-of-way, showing that mitigation measures are associated with the impacts of the project where the impacts occur. Overall, this accomplishes a reduction in road density of 24% (table 2-75, figure 2-19) Assuming a 14-foot average road width, 29.22 miles of proposed road decommissioning would revegetate approximately 50 acres that are currently native road surfaces in the Spencer Creek watershed. This mitigation is responsive to ACS objectives 2 through 5 and Standards and Guidelines for Key Watersheds (Forest Service and BLM 1994b, p. B-11, C-7).	Riparian Reserves

TABLE 2-73

Proposed Offsite Mitigation Projects on NFS Lands and BLM Lands

Agency	Project Type	Project Name	Quantity	Unit	Project Rationale	Land Allocation
BLM	Road Drainage	Keno Access Road Repair and Culvert Replacement	1	site	Spencer Creek is a Tier 1 Key Watershed. Although BMPs and other project measures would be implemented, the PCGP would have road-like watershed impacts, including mobilization of sediment and possible alteration of hydrologic regimes. The existing stream crossing (culvert) is undersized in both length and diameter; therefore, its ability to meet ACS objectives is minimized. The culvert underlying the existing roadbed periodically causes erosion of the road prism and adjacent upland and riparian areas. Replacement of the culvert will allow stabilization of the road shoulder and reduce sediment input to Miner's Creek and its contribution of sediment to Spencer Creek. If this work is not completed, the condition will eventually lead to increased sedimentation. Replacement of this drainage structure will decrease road-related erosion, increase the hydrologic capacity of the crossing, and enhance aquatic connectivity for fish and other aquatic organisms.	
		Spencer Cr. Drainage Improvements and Sediment Trap Removal	15	sites	Spencer Creek is a Tier 1 Key Watershed. Although BMPs and other project measures would be implemented, the PCGP would have road-like watershed impacts, including mobilization of sediment and possible alteration of hydrologic regimes. The project also uses a number of roads for access and construction. Drainage improvements and removing non-functioning cross drains and sediment traps at selected locations would benefit aquatic habitat/connectivity by restoring drainage and reducing sediment transport.	
BLM	Road Closure	Spencer Cr. Repair Existing Road Closure	12	sites	Roads negatively impact wildlife. Implementation of the PCGP project would have road-like impacts on wildlife and require use of a large number of permanent and temporary roads and other access routes. Road closures (barricades) were established in the watershed to reduce road density to meet RMP objectives for the ACS and to reduce impacts to wildlife. This project repairs the existing closure structures to ensure that road closures remain effective. Spencer Creek is a Tier 1 Key Watershed. Maintaining road closures also reduces sediment by keeping closed roads revegetated.	
FS	Aquatic/ Terrestrial	Allotment Fencing	6.5	Miles	Construct allotment fencing along the south side of the right-of-way through Forest Service-administered lands (approximately 6.4 miles). This fence would serve to divide the Buck Indian Allotment into pastures north and south at Clover Creek Road. This fence would keep cattle from grazing newly revegetated areas in the project right-of-way, including areas where the project crosses Spencer Creek, thus helping to ensure that erosion control and revegetation objectives are met.	Riparian Reserves

TABLE 2-73

Proposed Offsite Mitigation Projects on NFS Lands and BLM Lands

Agency	Project Type	Project Name	Quantity	Unit	Project Rationale	Land Allocation
FS	Aquatic/ Terrestrial	Harden Ford	1	Project	Stream crossing improvements would improve aquatic habitat/connectivity and reduce sedimentation. The road accessing this location has been closed on BLM and USFS lands. The private landowner and cattle cross the ford to access pasture from private land. The raw, unstable banks at this crossing allow fine sediments to enter the stream. This ford needs to be hardened and the banks revegetated and protected from grazing. The Forest Service side of the upper Spencer Creek dispersed campground needs more boulders or a method of blocking four-wheel vehicles.	Riparian Reserves
FS	Aquatic/ Terrestrial	Spencer Creek Stream Crossing Decommissioning	1	Project	Restoring stream crossings reconnects aquatic habitats by allowing the passage of aquatic biota and restoring riparian vegetation. Over time, these actions reduce sediment and restore shade. Restoration of these crossings includes riparian planting as a mitigation to help offset the impact of shade removal at pipeline right-of-way crossings.	Riparian Reserves

National Forest System Lands

The project crosses portions of Buck Lake and the Upper Spencer Creek subwatershed on NFS lands in the Spencer Creek watershed. All of the NFS lands in the Spencer Creek watershed are classified as a Tier 1 Key Watershed. Standards and Guidelines for Tier 1 Key Watersheds overlay all other land allocations. Figure 2-13 shows mitigation proposed on NFS lands.

Aquatic Conditions and Issues

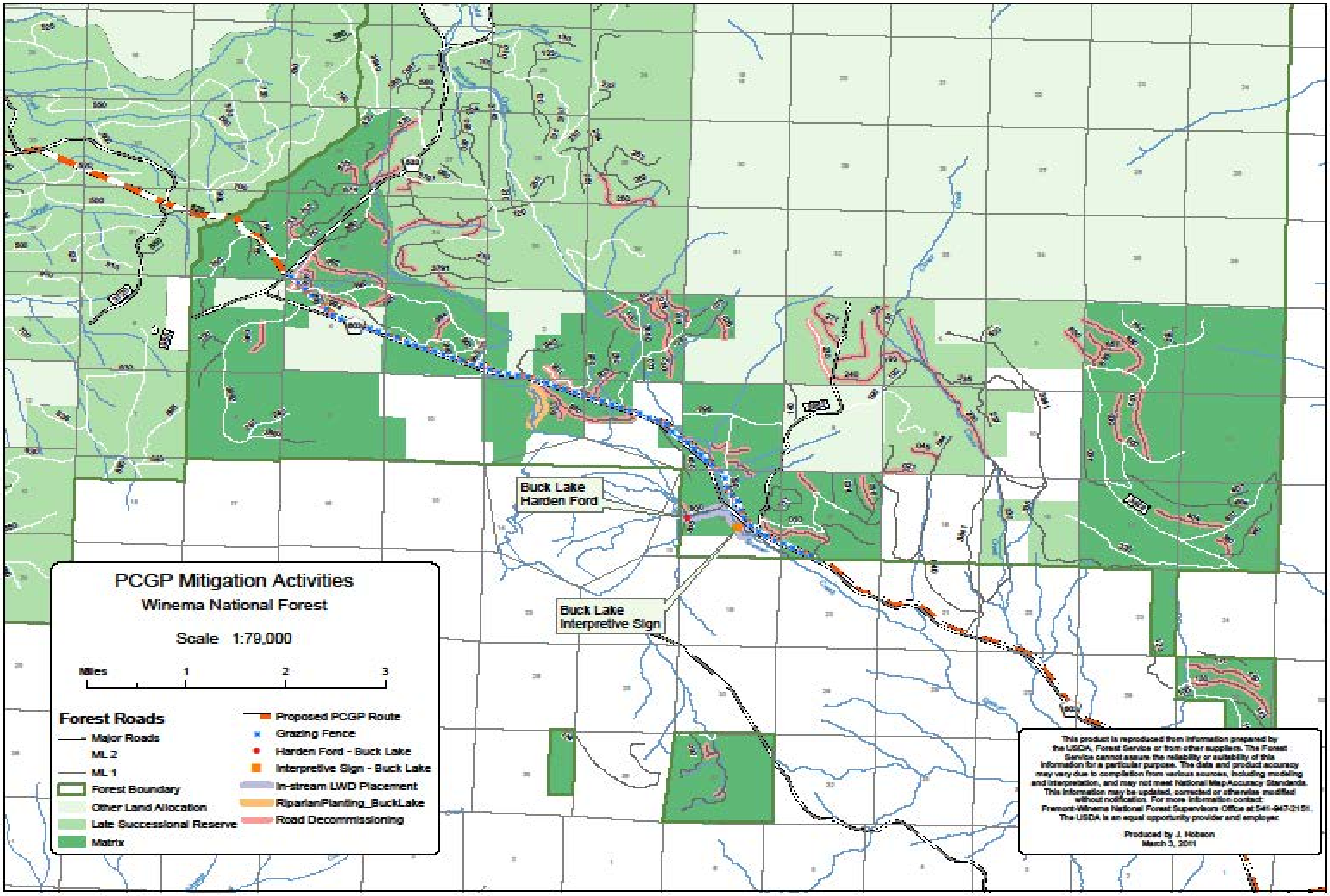
Spencer Creek is section 303(d) listed by the State of Oregon for biological criteria, sedimentation, and temperature (ODEQ 2010 database). Roads are the primary source of fine-grained sediments that negatively impact aquatic habitats. There are 150 road crossings and 23 miles of road within 100 feet of stream channels within the watershed. Roads and areas of compaction decrease soil productivity, prolong the vegetative recovery process, and increase runoff potential. Road densities and harvest have reduced near-term shading recruitment and stream side canopy closure in many areas. Streamside timber harvest and channelization and grazing at Buck Lake (mostly private property) have also affected aquatic resources. Fuel accumulation and dense white fir ladder fuels have increased the risk of high-intensity, stand-replacing fire in Riparian Reserves.

Terrestrial Conditions and Issues

Road density exceeds the recommended level for several wildlife species of concern, including deer and elk. Due to the distribution of blocks of late successional forest, habitat connections are minimal between large late-successional forest patches occurring within the watershed. This may restrict the movement and dispersal of some late successional-dependent wildlife species through the watershed. Fuel accumulation and dense white fir ladder fuels have increased the risk of high-intensity, stand-replacing fire.

Table 2-73 describes proposed mitigation measures on NFS lands that are responsive to these conditions and issues.

Figure 2-13 Mitigation Proposals for the Winema National Forest, Spencer Creek



Proposed Mitigation Projects

Table 2-74 compares project effects and proposed road decommissioning on NFS lands in Spencer Creek. Table 2-75 describes changes in road density with implementation of mitigation projects.

TABLE 2-74

Comparison of Project Effects and Proposed Road Decommissioning on NFS Lands, Spencer Creek Tier 1 Key Watershed

	Miles in Watershed a/	Acres in Riparian Reserves b/	Acres in Degraded Soil Condition/Acres Restored c/	# Stream Crossings d/
Project Right-of-Way	15.14	8.31	39	3
Roads Decommissioned	21.45	12.6	36	25

Source:
a/ Table 2.6.3.1-2
b/ Table 2.6.3.1-3
c/ See Road Decommissioning Data Tables in section 3.4. Acres in degraded soil condition are estimated at midpoint of range from 20-57 acres.
d/ Table 2.6.3.1-5

TABLE 2-75

Changes in Winema National Forest Road Density with Implementation of NFS Mitigation Plan Spencer Creek Tier 1 Key Watershed

Winema NF	Current Condition (miles/square mile)	With Road Decommissioning (miles/square mile)	Change in Road Density with Decommissioning (miles/square mile)
All Roads, Spencer Cr. KWS (NFS only)	2.64	2.02	-0.62
Within 1 Mile of Project	3.9	2.79	-1.11
Within 1/2 mile of Project	4.33	2.87	-1.46
Within 1/4 mile of Project	4.67	2.75	-1.92

Source: FS GIS Analysis, Road Density Analysis,

Cumulative Effects

Activities on NFS Lands

The Forest Service manages about 25% of the Spencer Creek watershed. Projects on NFS lands that would contribute to cumulative effects with the project are shown in table 2-76

TABLE 2-76

Current and Reasonably Foreseeable Future Actions on NFS Lands in the Spencer Creek Watershed

Unit	Fifth-Field Watershed	Sixth-Field Watershed	Project Name	Project Description	Affected Resource
WNF	Spencer Creek	Buck Lake	Lakewoods WUI Harvest Project	Variety of fuels treatments surrounding the Lakewoods private land subdivision. Commercial harvest approximately 70 acres.	Vegetation, soil compaction, road system
WNF	Spencer Creek	Buck Lake; Upper Spencer Creek	Indian Grazing Allotment	Cattle grazing	Vegetation, water quality, fisheries
WNF	Spencer Creek	Buck Lake; Upper Spencer Creek; Clover Creek	Buck Cattle and Horse Allotment	Livestock grazing	Vegetation, water quality, fisheries
WNF	Spencer Creek	Buck Lake; Upper Spencer Creek; Clover Creek	Road Maintenance	Variety of routine road maintenance activities	Road system
WNF	Spencer Creek	Buck Lake; Upper Spencer Creek; Lower Spencer Creek; Clover Creek	Road Decommissioning as part of project mitigation	Decommission approximately 21.45 miles as “offsite” project mitigation	Water quality, fisheries, soil compaction, road system
WNF	Spencer Creek	Buck Lake; Upper Spencer Creek; Clover Creek	Fremont-Winema Invasive Plant Treatment EIS 2009	Ongoing invasive plant treatment project currently prescribes treatment of known infestations of invasive plants and would reduce the potential for invasive plant introduction and spread by allowing for timely treatment sites in or near the project area	Vegetation
WNF	Spencer Creek	Buck Lake; Upper Spencer Creek; Clover Creek	project reclamation activities	All activities associated with reclamation of construction right-of-way, access roads; etc.	Vegetation, soil compaction, road system, water quality, fisheries

These activities are expected to be consistent with the Standards and Guidelines and objectives of the Forest Service LRMPs. Restoration thinning and hazardous fuels reductions are expected to contribute to improvements in watershed conditions by reducing stand density and reducing the probability of stand-replacing fire. Road improvements and decommissioning are expected to reduce road-related sediment transport to aquatic systems.

Activities on Non-Forest Service Lands

The BLM manages about 23% of the Spencer Creek watershed, and private lands comprise about 52% of the Spencer Creek watershed. There are no projects proposed on BLM lands that would contribute to cumulative effects with the project. Private lands in the watershed are expected to be managed according to current land use patterns consistent with the County General Plan and existing federal and state statutes including the Oregon Forest Practices Act and the Clean Water Act.

Cumulative Effects

The project right-of-way comprises about 0.41% of the NFS lands and 0.38% of other lands in the Spencer Creek watershed (table 2-64). The small proportion of the landscape affected by the project; ongoing land management on private lands; the regulatory framework between the BLM, ODEQ and ACOE applicable to the project; and the project location and routing make it highly unlikely that the portion of the Pacific Connector project on federal lands, when considered with other past, present, and reasonably foreseeable future actions would change watershed conditions in the Spencer Creek watershed in any significant, discernible, or measurable way.

Project Effects Compared by ACS Objective

Table 2-77 compares the project impacts to the objectives of the ACS for the Spencer Creek watershed. NFS lands where the ACS applies comprise approximately 41% of the Spencer Creek watershed (table 2-63). Watershed conditions and recommendations are found in the Spencer Creek watershed analysis (BLM et al. 1995). The project would include 91.72 acres and 6.05 miles on NFS lands. A total of 9.98 acres of Riparian Reserves or 0.60% of the Riparian Reserves in the watershed (table 2-65) would be affected on:

- Four intermittent stream channels and two wetlands crossed by the project.
- Four intermittent streams and two wetlands where Riparian Reserves are clipped but the associated stream channel or wetland is not crossed.

TABLE 2-77

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Spencer Creek Watershed

ACS Objective	**Project Impacts**
Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	Riparian Reserves are watershed-scale features. The project would clear about 8.63 acres or about 0.52% of Riparian Reserves on NFS lands in the Spencer Creek watershed (table 2-67). There are four intermittent stream channels crossed in the Spencer Creek watershed. No perennial streams are crossed. Riparian Reserves associated with two forested wetlands and four intermittent streams are clipped. Impacts to aquatic systems are expected to be short-term or minor and limited to the project scale because of application of BMPs and erosion control measures (see section 1.4.1). Clearing of 4.58 acres of LSOG vegetation in Riparian Reserves is a long-term change in condition, but is minor in scale and within the range of natural variability given the disturbance processes in Spencer Creek. The Spencer Creek watershed remains above the 15% threshold on federal lands for LSOG vegetation established in the NWFP (p. 1-174). LWD cleared in construction of the project right-of-way would be used to stabilize and restore stream crossings. Off-site mitigation measures including 29.2 miles of road decommissioning, 1 mile of instream projects, fencing, and riparian planting projects are expected to improve watershed conditions in the Spencer Creek watershed. While there are long-term changes in vegetation in Riparian Reserves from construction clearing of the project right-of-way, these would be minor in scale and well within the range of natural variability given the disturbance history of the watershed.

TABLE 2-77

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Spencer Creek Watershed

ACS Objective	Project Impacts
Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life-history requirements of aquatic and riparian-dependent species.	The project is not expected to affect spatial or temporal connectivity in the Spencer Creek watershed because the pipeline would be buried in all aquatic habitats crossed, consistent with the requirements of the exhibits specified in the POD (i.e., Wetland and Waterbody Crossing Plan). Additionally, all of the channels crossed in Spencer Creek are intermittent and are likely to be dry at the time of crossing. In the short-term, during construction, connectivity could be disrupted for 1-5 days. At each crossing, bed and bank disturbances are small (<15 feet wide). After construction, all disturbed areas would be returned to their approximate preconstruction contours and drainage patterns. The temporary project right-of-way would be restored and revegetated with native grasses, forbs, conifers, and shrubs, as outlined in the ECRP. After construction, key habitat components such as LWD and boulders would be restored onsite and the bed and banks would be returned to preconstruction conditions. By implementing these measures, lateral and longitudinal connectivity at the site scale would be maintained, although in the short-term, during construction, connectivity may be disrupted. With the exception of a few days during the construction of the crossing, access to areas necessary for life histories of aquatic and riparian-dependent species would not be obstructed. By restricting stream crossing operations to the ODFW instream work window, possible impacts to sensitive life stages of aquatic biota would be minimized. Road decommissioning that occurs within Riparian Reserves (approximately 9.63 acres) would contribute to restoration of aquatic connectivity. The residual levels of disturbance are anticipated to be well within the range of natural variability in the High Cascades Province.
Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	Impacts to the stream bed and banks would be minor and limited to the site of construction because the pipeline would be buried and the actual area of bank and stream bottom disturbance is small at each crossing (<15 feet wide). This level of disturbance is comparable to a bank failure (see section 1.4.1) and well within the range of natural variability for watersheds in the High Cascades Province. After construction, key habitat components such as LWD and boulders would be restored onsite and the bed and banks would be returned to preconstruction conditions, consistent with the exhibits to the POD (i.e., Wetland and Waterbody Crossing Plan). By implementing these measures, the fluvial integrity of the aquatic system at the site- scale would be maintained. Offsite mitigation measures (see section 2.6.3.6) would substantively improve watershed conditions by decommissioning 29.22 miles of roads (50 acres total of which 12.6 acres are in Riparian Reserves), replanting willows along 0.5 mile of perennial streams, and restoring LWD in 1 mile of Spencer Creek (see table 2.74).
Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	Project stream crossings in the Spencer Creek watershed are expected to occur when intermittent stream channels are dry. Minor amounts of sediment would be generated during construction that may be mobilized during the onset of seasonal precipitation in the fall. These impacts are expected to be short-term and limited to the general area of construction (see section 1.4.1). No long-term impacts on water quality are expected because of application of the ECRP including maintenance of effective ground cover (see section 1.4.1) and BMPs during construction (see sections 1.4.1.1). Offsite mitigation measures (table 2-73) address key issues identified in the watershed assessment and are expected to substantially improve watershed conditions.
Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of this sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.	The Spencer Creek watershed sediment regime was historically characterized by pulse-type depositions of coarser sediments from streambank erosion following major disturbances such as fires and high-intensity winter storms. More chronic erosion and deposition of fine-grained sediments, primarily from roads and to a lesser degree from land use, have replaced these pulse-type disturbances in the current sediment regime of the watershed. Project construction and operation are not likely to alter this sediment pattern nor are they likely to exacerbate these conditions. Sediment impacts from construction are expected to be like those described in section 1.4.1.2. Proposed mitigation projects including 29.5 miles of road decommissioning would contribute to reduction of sediments and restoration of aquatic functions at the watershed scale. Any sediment impacts are expected to be well within the range of natural variability given the disturbance history of the Spencer Creek watershed.

TABLE 2-77

Compliance of the Pacific Connector Pipeline Project with ACS Objectives, Spencer Creek Watershed

ACS Objective	Project Impacts
Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.	The project is unlikely to affect flow patterns in the Spencer Creek watershed because of the dispersed nature of impacts, high infiltration rates, and the relatively small proportion of the watershed affected (0.41%) (see table 2-64). Decommissioning roads (29.5 miles) as part of the offsite mitigation plan would contribute substantively to the restoration of flow patterns by restoring hydrologic connectivity at stream crossings that are decommissioned (see table 2-73).
Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	The project crosses two small wetland areas and clips the Riparian Reserve of another two forested wetlands. Trench plugs would be installed on each side of these wetlands as needed to block subsurface flows and maintain shallow, unconfined aquifer water table elevations, as required by FERC's Wetland and Waterbody Construction and Mitigation Procedures. By restricting crossings to the dry season (July 1 to September 15), possible impacts on shallow ground water tables of these wetland areas are expected to be minor and short-term.
Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation; nutrient filtering; and appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse, woody debris sufficient to sustain physical complexity and stability.	The project impacts on riparian vegetation in the Spencer Creek watershed would be minor. Approximately 9.98 or 0.60% of the Riparian Reserves in the watershed are potentially affected by the project (table 2-65). Existing herbaceous and brush cover would be maintained in Riparian Reserves to the extent practicable. Following construction, replanting with native species would facilitate reestablishment of vegetation communities. – and boulders from the project right-of-way would be returned to disturbed riparian areas. Revegetation of 12.6 acres of Riparian Reserves in roads that would be decommissioned would help to reestablish species composition and structural diversity of plant communities in Riparian Reserves (see table 2-74).
Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	The project impacts on riparian vegetation in the Spencer Creek watershed would be minor. Approximately 9.98 acres or 0.60% of the Riparian Reserves in the watershed are potentially affected by the project (see table 2-65). Following construction, replanting with native species would facilitate reestablishment of vegetation communities. LWD and boulders from the project right-of-way would be returned to disturbed riparian areas. Revegetation on 12.6 acres of roads that would be decommissioned would help to reestablish species composition and structural diversity of plant communities in Riparian Reserves. The project would waive application of Management Recommendations for Survey and Manage species in the watershed but would not prevent attainment of the ACS objectives because the viability of riparian-dependent Survey and Manage species would not be threatened. (See appendix F.5)

Summary and Conclusions

The Spencer Creek watershed is the easternmost and driest watershed crossed by the project in the High Cascades Province where the ACS applies. It is also a Tier 1 Key Watershed in the NWFP. Stream densities are much lower than for watersheds west of the Cascades crest. Precipitation patterns show a strong declining gradient from 40 inches a year on the crest of the Cascades to less than 12 inches where Spencer Creek flows into the Klamath River. The pumice soils in the watershed have high infiltration rates and rarely exhibit the overland flows and mass wasting seen in other watersheds crossed by the project. By locating the project adjacent to the Clover Creek Road for much of its length, impacts on wetlands and stream channels have been minimized when compared to the impacts of creating a new corridor.

Pacific Connector has modified the project to respond to the ACS objectives and has incorporated measures consistent with the Riparian Reserve Standards and Guidelines. The assessment demonstrates that short-term impacts would occur to streambanks, and to substrates at the site scale. Change in vegetative condition from clearing the project right-of-way is a long-term impact that would occur on 8.63 acres of Riparian Reserves. These impacts, however, are well within the range of natural variability given the disturbance processes that function in the watershed (see table 2-70). Also, because of the linear characteristic of the project, the Riparian Reserve crossings would be spread out across the landscape.

Off-site mitigation measures, identified by the Forest Service, would supplement on-site minimization, mitigation, and restoration actions. These proposed off-site mitigation measures are responsive to recommendations in the Spencer Creek Watershed Assessment (BLM et al. 1995) and would improve watershed conditions where they are applied (see table 2-73).

Three site-specific amendments to the Winema National Forest LRMP that have a nexus with the ACS are proposed to make provision for the project.

- Proposed amendments WNF-4 and WNF-5 would allow the project to exceed detrimental soil conditions within the project right-of-way. This would not prevent attainment of ACS objectives because soil decompaction and remediation required in Riparian Reserves is expected to effectively moderate detrimental soil conditions. Implementation of measures in the ECRP is expected to effectively control surface erosion and restore native vegetation.

- Proposed amendment of the Winema National Forest LRMP to waive protection measures for Survey and Manage species would not prevent attainment of ACS objectives because the project does not threaten the persistence of any riparian-dependent species (see appendix F.5).

The project is otherwise consistent with Standards and Guidelines for activities in Riparian Reserves for the Winema National Forest

The routing of the project through NFS lands, coupled with the relatively small area of NFS land affected (0.41% of NFS in the fifth-field watershed), makes it highly improbable that the project impacts could affect watershed conditions. Although there are project-level impacts (e.g., short-term sediment and a long-term change in vegetative condition at stream crossings), these would be minor in scale (see table 2-77).

No project-related impacts that would prevent attainment of ACS objectives have been identified. All relevant impacts are within the range of natural variability given the disturbance patterns and fire history of watersheds in the High Cascades Province (see table 2-70).

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