United States Department of Agriculture
Forest Service

Management Indicator Species Report

Pacific Connector Gas Pipeline Project

Umpqua National Forest
Rogue River-Siskiyou National Forest
Fremont-Winema National Forest

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1.0 INTRODUCTION

The National Forest Management Act of 1976 (NFMA) requires each National Forest to "provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives." Management Indicator Species (MIS) is a concept adopted by Forest Service ("1982 rule" provision in 36 CFR 219.19 (a)(1)) to monitor for species viability at the Forest level. As described in the 1982 Rule, MIS are "*plant and animal species, communities, or special habitats selected for emphasis in planning, and which are monitored during forest plan implementation in order to assess the effects of management activities on their populations and the populations of other species with similar habitat needs which they may represent"* (Forest Service Manual 2620.5). The role of MIS and the criteria to select MIS are described in 36 CFR 219.19 (a)(1) and Forest Service Manual 2600 (1982 Rule):

> *"In order to estimate the effects of each [Forest Plan] alternative on fish and wildlife populations, certain vertebrate and/or invertebrate species present in the area shall be identified and selected as management indicator species and the reasons for their selection will be stated. These species shall be selected because their population changes are believed to indicate the effects of management activities. In the selection of management indicator species, the following categories shall be represented where appropriate: Endangered and threatened plant and animal species identified on State and Federal lists for the planning area; species with special habitat needs that may be influenced significantly by planned management programs; species commonly hunted, fished or trapped; non-game species of special interest; and additional plant or animal species selected because their population changes are believed to indicate the effects of management activities on other species of selected major biological communities or on water quality."*

As described in the 1982 Rule, important characteristics of MIS include their capability of being effectively monitored and that relationships between species and their habitats and response to the effects of management activities of interest are well understood. MIS and their habitats have been used as part of a strategy to monitor implementation of Forest Plans and the effects to wildlife and plants. By monitoring the habitat changes of these particular indicator species, the effects of management activities on the associated animal communities can theoretically be determined. Since the habitats of MIS cover the majority of the vegetative seral stages on a specific National Forest, it is assumed that meeting the requirements of those species will assure that the needs of associated species will be met (Forest Service, 1990a).

In 2012, 36 CFR 219.19 was revised (2012 Rule). The 2012 Rule adopts an approach that focuses on maintaining and restoring ecological integrity (composition, structure, function, connectivity in order to meet species conservation objectives, and does not employ MIS. Rather, the 2012 Rule identifies Focal Species (species of conservation concern - SCC) for which there exists scientific evidence indicating substantial concern for the species' capability to persist over the longer term in the Forest, and that can be used to monitor the status of ecological integrity. Instead of monitoring trends of MIS, a select set of ecological conditions are monitored.

This assessment examines potential effects to MIS and to concomitant wildlife resources which may result from implementation of activities associated with the Proposed Action which includes both a liquefied natural gas (LNG) terminal in Coos Bay, Oregon (LNG Terminal) and a 229-mile natural gas pipeline (Pipeline); however, only the Pipeline will cross lands managed by the Forest Service. As a result, the LNG terminal will not be discussed further in this document. Portions of the Pipeline will cross the Umpqua, Rogue River-Siskiyou, and Fremont-Winema National Forests. Because the Land Resource Management Plans for these forests have not been amended, potential effects to MIS continue to be assessed included in the 1982 Rule.

This analysis identifies MIS on each National Forest that will be potentially affected by the Pipeline; the management indicators that each MIS represents, including management goals, standards, guidelines, and prescriptions for the management indicators; the status of MIS habitats and populations on National Forests or vicinities, if known; the habitats that will be affected; and the effects in relation to achieving Forest Plan standards. Wherever possible, the analysis in this document includes available information on recent population trends, though in most instances population indices in one form or another have been developed from limited data or used directly, if available, from other sources. Table 1-1 provides a list of MIS considered for each National Forest crossed by the Pipeline.

Proposed Action. The 229-mile Pipeline crosses Coos, Douglas, Jackson, and Klamath Counties in Southwest Oregon. The Umpqua, Rogue River-Siskiyou, and Fremont-Winema National Forests will be crossed.

To construct the Pipeline, PCGP must remove vegetation, including trees, from within the construction right-of-way, temporary extra work areas, and other limited locations (rock disposal sites, hydrostatic test sites, and temporary access roads). In addition, PCGP will also utilize uncleared storage areas (UCSAs) at various locations along the route to store forest slash, stumps, and dead and downed log materials that will eventually be scattered across the right-of-way after construction. UCSAs will mostly be located in dense, mature forested areas, in areas of steep slopes, and in areas where the route follows steep, narrow ridgelines. However, to minimize overall disturbance, UCSAs will not be cleared of trees during construction.

PCGP will be restoring some portions of impacted habitats by revegetating them with native species of grasses and shrubs, and replanting conifers within forested areas crossed by the Pipeline. Restoration of grasslands, shrublands, and early successional forest stages will occur within shorter time spans than restoration of mid-seral forests. In some cases, PCGP will enhance or create habitat features through, for example, girdling trees to create snags, and will be supporting agencies' treatments of forested stands through pre-commercial thinning projects that may enhance forest understories and accelerate development of late successional growth characteristics in treated conifer stands.

PCGP must retain a maintenance corridor 30 feet wide centered on the pipeline. That corridor will be maintained in an herbaceous and/or shrub state during the life of the Pipeline. Direct restoration of late successional-old growth forests >80 years old cannot occur during the life of the Pipeline, assumed to be 50 years. To mitigate for losses of late successional-old growth forests, PCGP is developing a Comprehensive Mitigation Plan (CMP). The CMP previously included funding for implementation of projects proposed by the Forest Service to be carried out within each National Forest crossed by the Pipeline. The Forest Service will be reviewing previously proposed projects to verify their relevance to the current proposed Pipeline and these projects or similar projects will be included in the CMP. Funding of such projects would offset impacts within Northwest Forest Plan (NWFP) Late Successional Reserves (LSRs) – mapped and unmapped, Riparian Reserves, and for species dependent on affected habitats within those land allocations in each forest to at least a neutral level. That is, implementation of the Forest Service's proposed projects will mitigate effects of the Pipeline so that levels of ecological services provided after construction of the Pipeline are the same as those provided before construction of the Pipeline.

Table 1-1
Summary of Management Indicator Species Analyzed for Each National Forest Affected by the Pipeline

Common Species Name / *Scientific Name*	Umpqua NF	Rogue River-Siskiyou NF	Fremont - Winema NF	General Habitat Targeted	Status[1]		
					Federal	State/ODFW	Conservation Status
Northern Spotted Owl *Strix occidentalis caurina*	MIS	MIS	MIS	Mature and old-growth coniferous forest	FT	ST	G3G4T3, S3
Pileated Woodpecker *Dryocopus pileatus*	MIS	MIS	MIS	Mature and old-growth coniferous forest	MBTA		G5, S4
Black-backed Woodpecker *Picoides arcticus* [Three-toed Woodpecker *Picoides tridactylus]*			MIS	Mature and old-growth coniferous forest	MBTA	SEN	G5, S3
American (Pine) Marten *Martes americana*	MIS	MIS	MIS	Mature and old-growth coniferous forest			G5T1
Bald Eagle *Haliaeetus leucocephalus*	MIS		MIS	previously listed as T&E	MBTA, BCC-5, BMC FS - Sensitive		G5, S4BS4N
Peregrine Falcon Falco peregrinus	MIS			previously listed as T&E	MBTA, BCC-5, BMC	SEN	G4, S1
Northern Goshawk *Accipiter gentilis*			MIS	Mature and old-growth coniferous forest	SOC MBTA, BCC-5	SEN	G5, S3
Roosevelt Elk *Cervus elaphus roosevelti*	MIS	MIS		Big game winter range			G4T4
Columbian Black-tail deer *Odocoileus hemionus columbianus*	MIS	MIS		Big game winter range			G5, S5
Mule Deer *Odocoileus hemionus*			MIS	Big game winter range			G5, S5
Acorn Woodpecker *Melanerpes formicivorus*	MIS			Dead and defective tree habitats	SOC MBTA	SEN	G5, S3
Lewis Woodpecker *Melanerpes lewis*	MIS			Dead and defective tree habitats	SOC MBTA, BCC-R9 FS - Sensitive	SC	G4, S2S3B
Yellow-bellied Sapsucker *Sphyrapicus varius*	MIS			Dead and defective tree habitats	MBTA		G5

Common Species Name / *Scientific Name*	Umpqua NF	Rogue River-Siskiyou NF	Fremont - Winema NF	General Habitat Targeted	Status[1]		
					Federal	State/ODFW	Conservation Status
Williamson Sapsucker *Sphyrapicus thyroideus*	MIS			Dead and defective tree habitats	MBTA, BCC-R9		G5, S4BS3N
Hairy Woodpecker *Picoides villosus*	MIS	MIS		Dead and defective tree habitats	MBTA		G5, S4
Downy Woodpecker *Picoides pubescens*	MIS	MIS		Dead and defective tree habitats	MBTA		G5, S4
Northern (Common) Flicker *Colaptes auratus*		MIS		Dead and defective tree habitats	MBTA		G5, S5
Winter Steelhead *Oncorhynchus mykiss*	MIS			Water quality		SEN	G5T3Q , S2S3
Summer Steelhead *Oncorhynchus mykiss*	MIS			Water quality		SEN	G5T2T3Q,S2S3
Inland Redband Trout *Oncorhynchus mykiss spp.*			MIS	Water quality	FS - Sensitive		G5T4, S3

[1] Status:

- Federal: MBTA = Migratory Bird Treaty Act, SOC = Federal Species of Concern, BCC = Bird of Conservation Concern (R9 = Region 9, R5 = Region 5), BMC = Bird of Management Concern, FS – Sensitive = Forest Service Region 6 sensitive species, FT = Federal Threatened
- State: ST = State Threatened; SC = ODFW sensitive-critical and SEN = ODFW sensitive.
- Conservation Status (NatureServe, 2017): G = Global, S = Oregon State, T = intraspecific taxon, B = Breeding, N = Nesting, Q = Questionable taxonomy; 1 = critical imperiled, 2 = imperiled, 3 = vulnerable, 4 = apparently secure, 5 = secure.

2.0 UMPQUA NATIONAL FOREST

Species. The Umpqua National Forest Plan (1990b) includes the following species as MIS: northern spotted owl, pileated woodpecker, pine marten, bald eagle, peregrine falcon, Roosevelt elk, Columbian black-tailed deer, and primary cavity nesters (acorn woodpecker, Lewis's woodpecker, yellow-bellied sapsucker, Williamson's sapsucker, hairy woodpecker, and downy woodpecker; Table 1-1). Indicator species for water quality in the Forest include summer and winter steelhead runs. The northern spotted owl, pine marten, and pileated woodpecker represent various mature and old growth conifer habitats. Primary cavity excavators represent dead and defective tree habitats. Big game winter range is represented by Roosevelt elk and black-tail deer.

The bald eagle and peregrine falcon were listed as threatened or endangered species requiring special management at the time of the Forest Plan's release, but have since been delisted. However, they are included in this discussion because they still remain indicator species under the current Forest Plan (1990b). The northern spotted owl is now listed under the Endangered Species Act, and its status is covered extensively under separate cover in the Biological Assessment.

Habitats. MIS in the Umpqua National Forest are associated with a variety of habitats found throughout the forest. However, the Pipeline will cross only those habitats included in Table 2-1, below. Table 2-1 summarizes the areas (acres) of habitat affected within the Umpqua National Forest, including forested habitats (Southwest Oregon Mixed Conifer-Hardwood Forest), non-forested habitats, and other affected habitat categories; forested habitat is differentiated by seral stages including clearcut-regenerating forest, mid-seral forest, late successional-old growth forest. Potential effects of the Pipeline have been summarized by component during construction and during operation. Generally, most long-term disturbance is due to a 30-foot wide maintenance corridor, centered on the pipeline that is maintained in an herbaceous and/or shrub state for the life of the Pipeline. Table 2-1 is referenced in discussions for each MIS in the sections, below.

The forest habitat crossed – Southwest Oregon Mixed Conifer-Hardwood Forest (Johnson and O'Neil, 2001) – corresponds to two vegetation categories described by the Oregon Gap Analysis Project (Oregon Gap; Kagan et al., 1999) and mapped generally within 100 meters of the Pipeline project. Those vegetation categories include 1) Douglas-fir-White Fir/Tanoak-Madrone Mixed Forest, and 2) Douglas-fir Dominant-Mixed Conifer Forest (Kagan et al., 1999). In 2015, a large stand-replacing fire (the Stouts Creek fire) burned approximately 26,452 acres on Roseburg BLM District, Umpqua National Forest, and some private landowners (Northwest Interagency Coordination Center 2015), including forest lands crossed by the Pipeline.

Douglas-fir-White Fir/Tanoak-Madrone Mixed Forest: Multi-layered forest of mixed conifer and mixed deciduous forest makes up this vegetation type. It always contains Douglas-fir, with other co-dominants (i.e., white fir, incense cedar, sugar pine and rarely western white pine). The subcanopy layers contain shade-tolerant trees, including tanoak, madrone, chinquapin, Pacific dogwood, and California laurel. Shrub and herb layers are generally well represented, and this forest type is found in low to mid elevations (Kagan et al., 1999).

Douglas-fir Dominant-Mixed Conifer Forest**:** Single-layer forest canopy is typical, although stand structure can be diverse in undisturbed late seral stands. There is a wide range of canopy closure based on management practice, disturbance history, and microsite. Douglas-fir is dominant, with a variety of coniferous trees including white fir, incense cedar, western white pine, ponderosa pine, and sugar pine. Understory vegetation is usually diverse and rich in species, and this forest type is found at mid elevations (Kagan et al., 1999).

Table 2-1
Summary of Construction and Operation-Related Disturbance (acres [1]) to Corresponding Wildlife Habitat Categories (Johnson and O'Neil, 2001) in the Umpqua National Forest

Component	Forest –Woodland Seral Stage [2]	Southwest Oregon Mixed Conifer-Hardwood Forest	Riparian		Developed		Open Water	Total
			Forested Wetland	Non-Forested Wetland	Developed-Urban and Mixed Environs	Roads		
CONSTRUCTION DISTURBANCE								
Pipeline Facilities								
Construction Right-of-Way	**L-O** **M-S** **C-R** **Tot**	67.99 19.20 30.02 117.20	0.11	0.01		6.57	0.18	124.07
Hydrostatic Discharge Sites [3]	**L-O** **M-S** **C-R** **Tot**							0
Rock Source/Disposal	**L-O** **M-S** **C-R** **Tot**	0 0.03 0 0.03			4.31	0.02		4.35
Temporary Extra Work Areas	**L-O** **M-S** **C-R** **Tot**	10.08 11.09 5.19 26.36	0.05		7.74	6.34	0.12	40.62
Access Roads	**L-O** **M-S** **C-R** **Tot**	0.17 0.04 0.02 0.24						0.24
Uncleared Storage Areas [4]	**L-O** **M-S** **C-R** **Tot**	34.04 7.59 0.07 41.7				0.41		42.10
Total Construction Disturbance	**L-O** **M-S** **C-R** **Tot**	112.28 37.96 35.29 185.52	0.15	0.01	12.05	13.34	0.30	211.38
OPERATION DISTURBANCE								
Pipeline Facilities								
30-foot Maintenance Corridor	**L-O** **M-S** **C-R** **Tot**	20.43 6.04 10.19 36.66	0.03			2.52	0.08	39.30
Total Operation Disturbance	**L-O** **M-S** **C-R** **Tot**	20.43 6.04 10.19 36.66	0.03	0	0	2.52	0.08	39.30

[1] Acres disturbed were evaluated using GIS; footprints for each component (temporary construction right-of-way, temporary extra work areas, temporary access roads, uncleared storage areas, pipe storage yards, aboveground facilities, permanent easement, and 30-foot maintenance corridor) were overlaid on the digitized vegetation coverage.

[2] Forest-Woodland Seral Stages are L-O, Late Succession/Old Growth assumed to be ≥80 years old; M-S, Mid-Seral assumed to be ≥40 but ≤80 years old; C-R, Clearcut-Regenerating Forest assumed to be ≤40 years old.

[3] Small brush or trees may be cleared by a rubber-tired rotary or flail motor (brush hog) or by hand with machetes/chainsaws. No soil disturbance will occur. A rubber-tired or track hoe will be utilized to lay the discharge line and to remove the saturated hay bales or filter bags upon completion of hydrostatic discharge.

[4] PCGP uncleared storage areas (UCSAs) will not be cleared of trees during construction. These areas will be used to store forest slash, stumps and dead and downed log materials that will be removed and scattered across the right-of-way after construction during restoration and are considered as temporary insignificant habitat modifications.

Other habitat types affected by the Proposed Action within the Umpqua National Forest (Table 2-1) include: forested and non-forested wetlands, developed-urban and mixed Environs, and open water.

Forested Wetlands or Palustrine Forest: This type is typically multi-storied canopy (trees >18 feet tall). Deciduous trees generally dominate in eastern Oregon, including black cottonwood, white alder, quaking aspen, and peach leaf willow. In western Oregon, conifer trees such as western red cedar, western hemlock, Douglas-fir, and grand fir tend to dominate the canopy. This forest type is located in narrow riparian zones along flowing waterbodies (Kagan et al., 1999).

Non-Forested Wetlands or Palustrine Emergent**.** This type is made up of freshwater herbaceous wetlands that contain medium tall (2-4 feet) to tall (>4 feet) grass or grass-like plants. Common herbaceous plants include cattails, bulrush species, and bur reed. Grasses associated with this category are blue wild rye, tufted hair grass, blue joint weed grass, reed canary grass, American slough grass, and northern manna grass (Kagan *et al.* 1999).

Developed-Urban and Mixed Environs: This type can include urban areas located in cities and municipalities (Kagan et al., 1999), areas associated with the sale of products and commercial services (Anderson et al., 1976) and industrial sites, typified by light to heavy manufacturing and buildings associated with mining, including rock quarries (Anderson et al., 1976). It also includes landscaped, vegetated areas surrounding residences and/or commercial buildings.

Roads: This type is made up of non-vegetated, manmade highways and roads, either paved or un-paved. It is often included in the urban category (Johnson and O'Neil, 2001; Kagan et al., 1999; Anderson et al., 1976).

Open Water includes rivers, creeks, and other linear waterbodies. It may also include non-vegetated, smooth and sloping accumulations of sand and gravel along shorelines (Anderson et al., 1976) as well as ditches and canals since they contain excavated drainages or conveyance features that drain agricultural or upland areas.

2.1 Northern Spotted Owl

The northern spotted owl (NSO) was selected as an MIS for mature and old growth habitat, and in the 1990 Umpqua National Forest Plan there was 392,000 acres of modeled suitable NSO nesting, roosting, and foraging (NRF) habitat and 154 inventoried NSO pairs (Forest Service, 1990b). The NSO was proposed for listing under the Endangered Species Act (ESA) when the Umpqua National Forest's Plan was signed in 1990, and was officially listed as Threatened in 1992. The Northwest Forest Plan (1994) amended the Umpqua's Forest Plan (Forest Service, 1990b), and was designed to ensure the population viability of the NSO. Since the NSO is now listed under the Endangered Species Act, it is covered extensively under separate cover in the Biological Assessment prepared for the Proposed Action. A summary of the status of NSOs and its habitat on Umpqua National Forest is included here, including effects to NSO habitat from the Pipeline. Additional information can be reviewed in the Biological Assessment.

Umpqua National Forest occurs within two physiographic provinces within the range of the northern spotted owl: Klamath Mountains and West Cascades. As part of the Northwest Forest Plan Monitoring, a habitat model for NSO has been developed and subsequently revised to track changes in NSO habitat from the inception of the Northwest Forest Plan (BLM and Forest Service, 1994) through 2012 and is included in the 20-year monitoring report for the NSO. This model was peer reviewed and published in a General Technical Report (GTR) in 2016 (Davis et al., 2016).

This model applied to the Umpqua National Forest predicts that there is approximately 584,624 acres of suitable NSO NRF habitat available, which is an increase of 192,624 acres of suitable NSO habitat from what was predicted in the 1990 Forest Plan. Through surveys for spotted owls that have occurred from the early 1990's through 2008 in the Umpqua National Forest, there are 294 pairs of NSO documented to have occurred or are occurring in the Umpqua National Forest, with an additional 51 resident singles (Umpqua National Forest, 2013 GIS data layer). This is an increase of approximately 140 pairs of NSO documented in Umpqua National Forest since the 1990 Forest Plan.

The proposed Pipeline affects NSO habitat (high NRF, NRF, dispersal only, and capable habitat as defined by FWS in the Conservation Framework developed for the Proposed Action; see FWS, 2014) in the Umpqua National Forest within the Klamath Mountains physiographic province. All NSO habitat affected by the Proposed Action in the Umpqua National Forest occurs within NSO home ranges; some of the NSO home ranges analyzed in the Umpqua National Forest are not "known" NSO sites, but sites determined to be a "best location" from survey efforts conducted for the Pipeline or an area that has enough suitable habitat that could be used for nesting by NSO ("assumed"). Twelve known NSO home ranges with a radius of 1.3 miles occur within the Pipeline project area and will have NSO habitat affected, including habitat from four NSO core areas and one nest patch (affected by the 2015 Stouts Creek fire); three best location home ranges and one assumed home range are also analyzed within Umpqua National Forest. Table 2-2, below identifies the amount of NSO habitat removed by the Pipeline in the Umpqua National Forest. Overall, the Pipeline would remove approximately 78.24 acres of NRF habitat (high NRF and NRF, combined), which is approximately 0.01 percent of the 584,624 acres of NRF habitat available within Umpqua National Forest.

Table 2-2
Summary of NSO Habitat Removed (acres) within Umpqua National Forest

NSO Habitat	Construction Right-of-Way	Temporary Extra Work Space	Rock Source /Disposal	Access Roads (TAR)	Total Habitat Removed
High NRF	36.37	4.99			41.36
NRF	31.62	5.09		0.17	36.88
Dispersal Only	19.20	11.09	0.03	0.04	30.37
Capable	30.02	5.19		0.02	35.22
Total NSO Habitat	**117.20**	**26.36**	**0.03**	**0.24**	**143.83**

2.2 Pileated Woodpecker

This large woodpecker was identified as a management indicator species because of the number and size of snags it requires and its need for mature stands of timber for nesting habitat, especially the hemlock / white fir, silver fir / Shasta red fir, and Douglas-fir / ponderosa pine eco-classes. The species may provide information for other cavity excavating species and animal communities associated with late successional forest. The pileated woodpecker requires the largest snags of any of the primary cavity nesters in the Umpqua National Forest (Forest Service, 1990b). The pileated woodpecker is protected under the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-712).

The following Standards and Guidelines and Management Prescriptions were identified in the Forest Plan to conserve and manage for pileated woodpeckers and their habitat:

<u>Applicable Forest Plan Forest-wide Standards and Guidelines.</u>

- 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.
- 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.

Management Prescriptions.
Prescription C5-VII, Wildlife – Pileated Woodpecker, Dedicated applies to 600-acre areas with the purpose of providing suitable reproduction habitat for pileated woodpeckers.

- Wildlife and Fish: Vegetation manipulation or structural improvement designed to enhance wildlife permitted. Activities designed to produce the desired number of snags and dead and down material per acre on a continuing basis will be featured and receive high priority. Areas for nonstructural improvement are the priority for this prescription.
- Timber: No timber harvest or salvage in the 300-acre reproduction area. An adjacent 300 acres will be managed to provide snags at the minimum rate of two snags per acre >12 inches dbh. Six green trees per acre will be left to provide for future snags. A minimum of one snag >20 inches dbh per 6 acres will be provided. Commercial and personal-use firewood cutting shall be an incidental secondary product of timber harvest. Firewood cutting and gathering shall be limited to that needed for onsite recreational use.
- Facilities: Generally no construction of new roads or corridors in a 300-acre reproduction area, except where vital to serve adjacent areas. Exceptions will be on a case-by-case basis. Acreage lost to roads or corridors will be compensated by additions to the reproduction areas. Normal maintenance of existing roads is permitted. Corridors may be allowed within the 300-acre area adjacent to the reproduction area, as determined by the NEPA process. Full road activities to meet timber objectives will occur in the 300-acre area adjacent to the reproduction area.
- Protection: No snag removal for pre-suppression purposes. No insect or disease control unless it is catastrophic in nature (threatening 50 percent or more of the stand).

Prescription C5-VIII, Wildlife – Pileated Woodpecker, Managed directs that an area of 2,011 acres be managed with a 130-year rotation. The prescription will be applied to timber stands to proved suitable habitat characteristics for the pileated woodpecker on at least 600 acres properly located at any point in time.

- Wildlife and Fish: Vegetation manipulation or structural improvement designed to enhance wildlife permitted. Activities designed to produce the desired number of snags and dead and down material per acre on a continuing basis will be featured and receive high priority. Areas for nonstructural improvement are priority for this prescription.
- Timber: Timber stands will be managed to maintain at least 300 acres >20 inches dbh at all times. Salvage is not permitted around the 600-acre designated core area. Firewood cutting shall be an incidental secondary product of timber harvest. Firewood cutting and gathering shall be limited to that needed for onsite recreational use.
- Facilities: Replacement areas have no special restrictions for the first 90 years of the rotation period. During the last 40 years of the rotation, only arterial roads will be maintained. All other roads will be obliterated or maintained only to protect soil and water values. For the periphery portion of replacement area, full road management is permitted even during last 40 years of rotation period. Utility/transportation corridors may be allowed pending determination by the NEPA (EA) process.
- Protection: No snag removal for pre-suppression purposes. No insect or disease control unless it is catastrophic in nature (threatening 50 percent or more of the stand).

Also see *Prescription C5-VI, Wildlife – Snag Management Areas* below for Primary Cavity Excavators.

Management Areas.
Two Management Areas, MA 10 and MA 11, in which the above prescriptions are directed toward managing habitats utilized by pileated woodpeckers, will be affected by the Proposed Action:

Management Area 10 Direction. Pileated woodpecker prescriptions (C5-Vll and Vlll, discussed above) are assigned to locations that meet the distribution requirements set out in the Forest-wide wildlife standards and guidelines. Where these locations overlap other prescription assignments that harvest timber, the managed prescription (C5-VIII) is assigned. Where these locations overlap other prescription assignments that do not harvest timber, the dedicated prescription (C5-VII) is assigned (Forest Service, 1990b).

Management Area 11 Direction. Same as for MA 10.

Habitat. Pileated woodpeckers are found primarily in dense mixed confer forests in late seral stages, or in bottom land deciduous stands (Marshall et al., 2006). The birds require snags 50 feet or greater in height and 20 inches in diameter at a 50-foot height, downed logs, diseased trees, and a fairly high density of snags of all sizes (Forest Service, 1990b). This late seral association indicates the need to utilize large trees for nesting, foraging, roost sites, and cover from predators (Marshall et al., 2006). In the Umpqua National Forest, mature to old growth stands that have not been salvage-logged are generally considered prime habitat for pileated woodpeckers. The hemlock/white fir, silver fir/Shasta red fir, Douglas-fir/ponderosa pine eco-classes are considered capable habitats for the species (Forest Service, 1990b). The Umpqua Forest Plan (Forest Service, 1990b) estimated there was 714,499 acres of capable habitat in those eco-classes, and 485,859 acres of suitable pileated woodpecker habitat in 1990.

To determine current habitat available for pileated woodpeckers in the Umpqua National Forest, the NSO habitat created by Davis et al. (2016) was used as a surrogate for pileated woodpecker habitat since both species are an indicator for the same mature/old-growth habitat. In addition to the NSO habitat, snag habitat has also been identified as an indicator for pileated woodpeckers. To quantify current snag habitat, fire perimeters and documented tree mortality from the Region 6 Aerial Insect and Disease surveys from the past 10 years (2008 - 2017) were counted as suitable snag habitat for pileated woodpeckers to forage in (Table 2-3). Using both the NSO habitat model and snag habitat created by wildfire and insects, there are 619,433 acres of current habitat, an increase of 133,574 acres from the 1990 Forest Plan habitat estimate. Habitat is distributed sufficiently to ensure dispersal of breeding Pileated Woodpecker across the Forest's suitable habitat.

Table 2-3
Acres of Snag Patches Estimated by the Region 6 Aerial Detection Surveys (2007-2016) and Wildlife Perimeters (2007-2016) to Measure Current Functional Snag Habitat in the Umpqua National Forest

Insect & Disease Agent	Acres
Douglas-fir Beetle	9,116
Mountain Pine Beetle-Lodgepole	24,143
Mountain Pine Beetle-Ponderosa	22
Mountain Pine Beetle-Sugar Pine	1,385
Mountain Pine Beetle-Western White Pine	720
Western Pine Beetle	757
Total Acres of Snag Patches Created by Insect & Disease	*36,143*
Fire Year	**Acres**
2008	20,588
2009	21,753
2011	747
2012	24
2013	18,004
2014	323
2015	17,119
Total Acres of Fire Perimeters	*78,558*
Total Acres of Snag Habitat	***114,701***

Pileated woodpeckers are generally associated with Southwest Oregon Mixed Conifer-Hardwood Forests and Westside Riparian Wetlands – both are habitat type associations described by Johnson and O'Neil (2001) – that coincide with the Pipeline (Table 2-1) within Umpqua National Forest. Since they are dependent on downed wood and snags, pileated woodpeckers would be most likely to inhabit the old growth or late successional stands (≥80 years old) of Southwest Oregon Mixed Conifer-Hardwood Forest that are included in Table 2-1. They are, however, closely associated with small, medium, large, and giant tree forested stands that provide structural conditions with decadent wood and snags (Johnson and O'Neil, 2001). A general association of a species with a given habitat applies to an adaptable species that is supported by a number of habitats that provide for its maintenance and viability, while a close association is indication of a species' dependency on a specific habitat for part or all of its life history requirements (feeding and reproduction) implying that the species has an essential need for a particular habitat for its maintenance and viability (Johnson and O'Neil, 2001).

Forest Management Activities. Logging, fire control, and road building activities that reduce the number of snags or potential snags, or convert mature stands to early successional timber stages have the greatest detriment on pileated woodpeckers. Past fire management practices have had a significant impact on their habitat. In the past, all snags within a 200-foot distance around the outside perimeter of harvest units were felled for fire protection purposes. This practice is no longer in use, although snags continue to be felled on a case-by-case basis where fire and safety concerns are high (Forest Service, 1990b).

Current management for the pileated woodpecker is incorporated in Forest and Regional snag management policies. This management is designed to maintain a well-distributed population of all cavity nesting species by providing habitat for 40 percent of potential population capability.

The results of applying snag management practices to timber sale operations have been variable (Forest Service, 1990b)

Species' Status in the Pipeline Project Area. Based on the reductions in suitable habitat in the Umpqua National Forest due to logging and associated activities during the last several decades, it could be expected that populations have been reduced by approximately 25 to 30 percent (Forest Service, 1990b). Even with the current snag management policy, future logging will continue to reduce this species' population. Also, the use of timber rotations of less than 100 years may not produce trees of suitable size to meet the nesting requirements of this species (Forest Service, 1990b).

Data have been collected on 17 National Biological Survey Breeding Bird Survey (BBS) routes (Pardieck et al. 2017) in Bird Conservation Region (BCR) 5 that are within approximately 50 miles of the Umpqua National Forest and the Pipeline, of which three BBS routes occur in the Umpqua National Forest. Numbers of each species that were reported on each route were compiled and averaged (numbers per route) for each year, 1997 through 2016, to develop indices of populations in the vicinity of the Pipeline and Umpqua National Forest. During the 20-year period, an average of 2.05 pileated woodpeckers were observed per BBS route (observed on average of 10.75 routes per year) each year. Over the past 20 years, pileated woodpecker populations appear to be relatively stable (neither increasing nor decreasing) on BBS routes within the Pipeline vicinity (Figure 2-1).

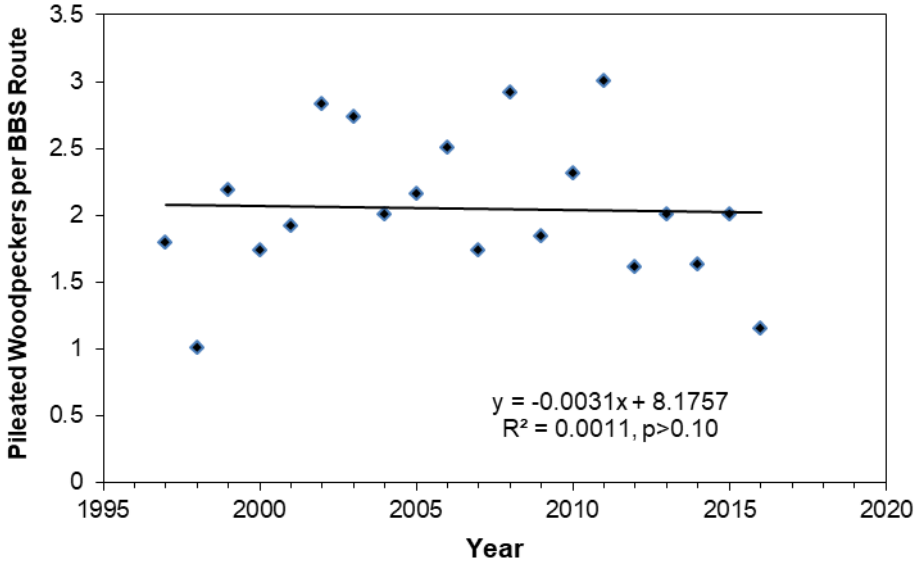

Figure 2-1
20-year Trend in Pileated Woodpeckers Counted per BBS Route in BCR 5 in the Vicinity of the Pipeline

Potential Effects of the Proposed Action. Pileated woodpeckers could be negatively impacted during construction of the Pipeline. Direct mortality of young could occur if nest trees are cleared prior to young fledging. Since nest excavation lasts from late March through early May, eggs are present in May and early June, and nestlings are present from late May through early July (Marshall et al., 2006), tree felling during those periods could directly impact young birds. While adults would be able to escape temporary disturbances, adult birds could abandon nests, leaving eggs and chicks vulnerable to predation and the elements. However, tree felling would not occur

between April 1 and July 15 (outside of the migratory bird primary nesting season), which will avoid impacting eggs and nestlings. Additionally, tree felling within 0.25 mile of one known NSO activity center and within 1.5 mile of a known peregrine falcon eyrie in the Umpqua National Forest will occur after the breeding period for northern spotted owls, from October 1 to the end of February and outside the breeding period for peregrine falcons (from August 1 through the end of December), further minimizing potential impacts to nesting pileated woodpeckers in those areas.

Clearing the right-of-way will modify habitat, changing the seral stage and tree species makeup of occupied forests. Construction will remove 78.24 acres of late successional-old growth Southwest Oregon Mixed Conifer-Hardwood Forest and 0.15 acre of Westside Riparian Forest in the Umpqua National Forest (Table 2-1). Also, 34.04 acres of late successional-old growth will be affected within UCSAs, but this is a short-term disturbance. Additional potential long-term effects to pileated woodpeckers will be removal of 37.96 acres of mid-seral conifer-hardwood forest (≥40 years but ≤80 years old), thereby setting back seral development that would be expected to eventually provide suitable habitat elements for pileated woodpeckers, including downed wood and snags.

The amount of late successional-old growth habitat that would be removed by the Pipeline is not expected to have an impact on the local or regional population of pileated woodpeckers which have mean home ranges of 478 hectares or 1,180 acres in western Oregon (Mellen, 1987; Mellen et al., 1992). If all of the impacted late successional-old growth Southwest Oregon Mixed Conifer-Hardwood Forest (112.28 acres, including UCSAs) occurred within a bird's or pair's one home range, less than 10 percent of one home range would be affected. More likely, the Proposed Action would span several home ranges and the overall effect to any single bird or a pair would be less than 10 percent removal. Removal of 78.24 acres of potentially suitable pileated woodpecker habitat represents approximately 0.01 percent of the 619,433 acres of currently available habitat in the Umpqua National Forest. Based on the foregoing, the continued viability of the species is expected.

If pileated woodpecker home ranges are assumed to be circular, the diameter of a 1,180-acre home range would be 8,090 feet. Blasting at one edge of that home range would attenuate to 30 dBA at the far edge of the home range and would attenuate to ambient noise (assumed to be 40 dBA) 4,630 feet away or a distance equal to 57 percent the diameter of a home range. Noise due to construction would be a short term effect (restricted to the period of constriction) to pileated woodpeckers and expected to affect them within only a small portion of their home ranges on a temporary basis to the extent that it is used.

Mitigation. Mitigation measures that would minimize potential impacts to pileated woodpeckers include planting trees within the right-of-way after construction, outside of the 30-foot maintenance corridor (within 15 feet of each side of the centerline). After tree planting, there will be 36.66 acres of former forest (20.43 acres of late successional-old growth, 6.04 acres of mid-seral forest, and 10.19 acres of clear cut-regenerating forest that will remain in an herbaceous and/or shrub state within the 30-foot maintenance corridor during the life of the Pipeline (Table 2-1).

Noise from blasting, if it is required during construction, will be minimized through application of various measures. Mitigation measures commonly applied to blasting of this type include drilling small (2.5-inch) charge holes, stemming the blast holes with sand and placing inert material on top of the blast area (Michael Minor & Associates, 2008).

In the Umpqua National Forest, trees will be felled before April 1 and after July 15, outside of the migratory bird primary nesting season. Where one known spotted owl activity center is within 0.25 mile of the Pipeline, tree felling will occur outside of the spotted owl breeding season within approximately 0.4 mile of the proposed construction right-of-way beginning October 1 and continuing through February 28. Additionally, approximately 2.10 miles of the proposed construction right-of-way in the Umpqua National Forest will be cleared from August 1 through the end of December within 1.5 miles of a peregrine falcon eyrie outside of the breeding season. Felling trees during these time periods will avoid directly impacting young birds during the nesting season.

To mitigate for loss of cavities and snags within the construction right-of-way, PCGP will create snags in large trees strategically left on the edge of the construction right-of-way by topping and or girdling trees. Previously, PCGP had agreed to fund other projects proposed by the Forest Service in the Umpqua National Forest that would provide benefits to primary cavity excavators within the Umpqua National Forest. The Forest Service will be reviewing these projects to verify their relevance to the current proposed Pipeline and implementation of these previously proposed projects or similar will be included in the CMP. Projects previously agreed to included creating snags and placing large wood in habitats adjacent to the proposed Pipeline that would meet the management objectives of snag densities and enhance areas deficient in coarse woody material. The projects previously proposed would treat approximately 570 acres and would accelerate the development of late successional habitat characteristics of structure and diversity (snags/large wood) including suitable nesting structures for pileated woodpeckers. Creation of snags and placement of large woody debris would also reduce localized fuel loads while improving habitat in deficient stands (large wood) and provide long-term structure in the event of fire since larger logs maintain moisture longer and are less likely to be fully consumed by fire. Additionally, PCGP had agreed to decommission or close 13 miles of roads, thin (commercial and/or pre-commercial) up to 5,650 acres of forest to accelerate development of late successional and old growth habitat characteristic among other objectives, and reallocate 585 acres from matrix to LSR designation so that forested habitat within former Matrix lands that would be managed to obtain late successional forest characteristics. Implementation of these previously proposed projects or similar projects would provide benefits to pileated woodpeckers within the Umpqua National Forest.

During construction, potential impact to nesting pileated woodpeckers and other species by predatory corvids will be addressed by assuring that all contractors practice appropriate and responsible trash disposal.

PCGP has also prepared a Migratory Bird Conservation Plan that identifies additional measures that would benefit pileated woodpeckers.

Forest Plan Consistency. The Proposed Action will affect forested habitat in Management Area 10 and Management Area 11. The location of the Proposed Action relative to designated 300-acre reproduction areas and 300-acre adjacent areas – managed to provide snags – within each Management Area will determine whether or not the Proposed Action is consistent with Management Prescriptions. If the Proposed Action crosses a dedicated 300-acre reproduction area, it would be inconsistent with Prescription C5-VII since no timber harvest or salvage in the 300-acre reproduction area is allowed. However, new corridors within the reproduction area may be allowed on a case-by–case basis, since Prescription C5-VII indicates that new corridors may be allowed within the 300-acre area adjacent to a reproductive area. Removal of snags within either Management Area by the Proposed Action is possible but inconsistent with Prescriptions C5-VII and C5-VIII.

2.3 Primary Cavity Excavators (nesters)

Primary cavity excavators have been identified as indicator species to represent the dead and defective tree (snag) component of conifer forest habitat, as they excavate cavities for nesting that are in turn used by a whole host of avian and mammalian secondary cavity nesters. Primary cavity excavators that are identified in the Forest Plan as MIS are the pileated woodpecker (discussed above), acorn woodpecker, Lewis's woodpecker, yellow-bellied sapsucker, Williamson's sapsucker, hairy woodpecker, and downy woodpecker (Forest Service, 1990b). The yellow-bellied sapsucker is rare to Oregon, with only 19 site records in the state (Marshall et al., 2006). This sapsucker is common east of the Rocky Mountains, but is closely related to the red-breasted sapsucker (*Sphyrapicus ruber*), which is the only sapsucker commonly found in western Oregon (Marshall et al., 2006) and is included in the following discussion and analysis.

The following Standards and Guidelines and Management Prescriptions were identified in the Forest Plan to conserve and manage for primary cavity excavators and their habitat:

Applicable Forest Plan Forest-wide Standards and Guidelines:

- 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.

Management Prescription.
Prescription C5-VI, Wildlife – Snag Management Areas – applies to any area scheduled for timber harvest where there is a need to provide snags for cavity-nesting birds. This prescription use at a rate of one acre per 100 acres of standard forest management prescription provides 10 percent potential population capability for the 100 acres.

- Wildlife and Fish: Snag densities needed to meet management requirement direction for cavity excavating birds must be provided within land areas that are generally no larger than normal harvest unit size (maximum 60 acres). These densities will be maintained through the full harvest rotation period. Snags provided above the management requirement (MR) level but that are needed to meet plan objectives will be distributed in order to:
    a. reduce likelihood of inter-specific crowding,
    b. increase likelihood of use by pairs,
    c. provide adequate numbers and types of snags throughout the rotation, and
    d. vegetation manipulation or structural improvement designed to enhance wildlife permitted. Activities designed to produce the desired number of snags and dead and down material per acre on a continuing basis will be featured and receive high priority. Areas for nonstructural improvement are priority for this prescription.
- Timber: All snags and dead and down material will be left. Thirty-three percent of the existing volume in green trees will be left standing. Green trees left standing shall represent mix of size classes in the unharvested stand. No salvage permitted. No commercial or personal-use firewood cutting. Gathering of firewood is allowed only for on-site recreational use, but cutting for this use is not allowed.
- Facilities: Utility/Transportation corridors may be allowed pending determination by the NEPA (EA) process.
- Protection: No special restrictions on insect and disease control.

Management Area 10 Direction. Adequate snag habitat must be provided in this management area to meet the 60 percent potential population capability (PPC) for cavity nesters. Other prescription assignments within the management area and immediately adjacent to the MA may

contribute to meeting this objective. Once all contributions to snag habitat have been identified, prescription C5-VI (see below) is assigned and distributed on land suitable for timber production to meet the 60 percent PPC objective.

Management Area 11 Direction. Same as in MA 10.

Species Status in the Pipeline Project Area. Prior to the implementation of the Umpqua National Forest Land Resource Management Plan (Forest Service, 1990b), logging and associated activities resulted in reductions of primary cavity nester suitable habitat and likely reduced populations by 20 to 30 percent. Minimum viable population levels for this group of species are met by providing dead and defective trees at the 20 percent potential population capability as described in *Wildlife Habitats in Managed Forests of the Blue Mountains of Oregon and Washington* and *Management of Wildlife and Fish Habitats in Forests in Western Oregon and Washington* (Thomas, 1979).

Data have been collected on 17 BBS routes (Pardieck et al., 2017) in BCR 5 that are within approximately 50 miles of the Umpqua National Forest and the Pipeline, of which three BBS routes occur in the Umpqua National Forest. Numbers of acorn woodpecker, red-breasted sapsucker, hairy woodpecker, and downy woodpecker that were reported on each route were compiled and averaged (numbers per route) for each year, 1997 through 2016 (Table 2-4) to develop a population index. No Lewis's woodpeckers, yellow-bellied sapsuckers, or Williamson's sapsuckers were reported in any of the BBS routes in BCR 5 within 50 miles of the Proposed Action in the past 20 years.

During the 20-year period, an average of 4.37 acorn woodpeckers and 1.10 hairy woodpeckers each year were observed per BBS route (average of 5.15 routes and 10.45 routes reporting per year, respectively) in BCR 5. Over the past 20 years, acorn woodpecker populations appear to be significantly increasing ($P<0.01$), as do hairy woodpeckers ($P< 0.01$) on BBS routes within BCR 5 in the vicinity of the Umpqua National Forest and the Pipeline (Table 2-4). In addition to pileated woodpeckers discussed above, acorn woodpeckers and hairy woodpeckers are the only other species of cavity nesters included as an MIS with sufficient data to estimate 20-year population trends, indexed as annual counts per route.

Table 2-4
Data Compiled for 20-years and Trends of Population Indices (Numbers Counted per BBS Route per Year in BCR 5) of Primary Cavity Excavator MIS in the Vicinity of the Umpqua National Forest and Pipeline

Cavity Nesting Species	Data Compiled for 20 Years, 1988-2007			
	Average Number of Routes per Year with Species$_1$	Average Annual Count of Species per Route [1]	Population Index Trend	Comments
Acorn Woodpecker	5.15	4.37	Significantly Increasing ($P< 0.01$)	none
Red-breasted Sapsucker	10.75	1.13	No Trend	none
Hairy Woodpecker	10.45	1.10	Significantly Decreasing ($P< 0.05$)	none
Downy Woodpecker	8.45	0.71	Insufficient data	Too few observations per year

[1] Data from BBS routes in Bird Conservation Region 5 within 50 miles of the Proposed Action.

Habitat. Primary cavity excavators' habitat requirements are dead and decaying trees of the appropriate diameter, height, and decay stage to meet the specific requirements of the various species. Found in both conifer and mixed conifer-deciduous, tree diameters required vary from

6 inches to 20 inches or greater DBH. Dead tree heights vary from 6 feet to 50 feet or more (Forest Service, 1990b and Marshall et al., 2006).

In the 1990 Umpqua Forest Plan EIS, there was estimated to be 803,917 acres of capable cavity nester habitat, with 244,473 acres being altered by timber harvest, for a total of 559,444 acres of suitable cavity nester habitat. The Forest Plan used potential population capacity (PPC), which "provides an indicator of the number of cavity-nesting species likely to be present in the Forest in comparison to the Forest's total potential." Minimum PPC identified for cavity excavators was 60 percent in most management areas (Table 2-5).

To monitor current cavity excavator habitat in the Umpqua, snag habitat was assessed using the data derived from 2006 imagery (Ohmann et al., 2010) for snags per acre greater than or equal to 10-inch diameter-at-breast-height (dbh). This results in 857,196 acres of habitat with one or more snags per acre (to meet the 60 percent PPC for hairy woodpecker of 1.15 snags per acre, which is the highest snag per acre requirement for any of the selected cavity excavators), and 776,970 acres with two or more snags per acre (which exceeds the 100 percent PPC for hairy woodpecker). At one snag per acre this represents 297,752 acre increase from the 559,444 acres of suitable snag habitat documented in the 1990 Umpqua National Forest Plan, and at two snags per acre this represents a 217,526 acre increase of suitable snag habitat. With the current distribution of snag habitat across the Umpqua National Forest increasing as compared to the 1990 Umpqua Forest Plan, primary cavity excavator habitat is being maintained in its amount and distribution to meet the viability requirements of the Umpqua Forest Plan.

Table 2-5
Cavity Excavator Maxim Potential Population Capacity by Snag/Acre as Described in the Umpqua National Forest Plan

	Percent of Maximum Populations (Snags/Acre)				
Cavity Excavators	**100**	**90**	**80**	**70**	**60**
Lewis' woodpecker	0.48	0.43	0.38	0.34	0.29
Acorn Woodpecker	0.7	0.63	0.56	0.49	0.42
Red-Breasted Sapsucker	0.45	0.41	0.36	0.32	0.27
Williamson's Sapsucker	0.33	0.3	0.26	0.23	0.2
Downy Woodpecker	0.16	0.14	0.13	0.11	0.1
Hairy Woodpecker*	1.92	1.73	1.54	1.34	1.15
Pileated Woodpecker	0.06	0.05	0.05	0.04	0.04
*Hairy Woodpecker had the highest snag/acre requirements of the cavity excavating species.					

Within the Pipeline route through the Umpqua National Forest, except for Williamson's sapsucker, the four Primary Cavity Excavator MIS included in Table 2-4 are associated with Southwest Oregon Mixed Conifer-Hardwood Forests. The acorn woodpecker has a close association with that habitat, but only when oak trees are present; the others are generally associated with Southwest Oregon Mixed Conifer-Hardwood Forests. A close association of a species with a given habitat indicates that it is known to depend on a specific habitat for part or all of its life history requirements (feeding and reproduction) implying that the species has an essential need for a particular habitat for its maintenance and viability (Johnson and O'Neil, 2001). A general association of a species with a given habitat applies to an adaptable species that is supported by a number of habitats that provide for its maintenance and viability (Johnson and O'Neil, 2001).

Since they are dependent on snags, Primary Cavity Excavator MIS would be most likely to inhabit the old growth or late successional stands (≥80 years old) of Southwest Oregon Mixed Conifer-Hardwood Forest that are included in Table 2-1. Hairy woodpeckers, Williamson's sapsucker, red-breasted sapsuckers, and Lewis's woodpeckers have general associations with Westside Riparian Wetlands and downy woodpeckers are closely associated with that habitat, while acorn woodpeckers have no association with that habitat type.

Forest Management Activities. Past fire management practices have reduced the amount of snag habitat. Because snags are more susceptible to fire than green trees and present control problems when accidentally ignited, they were systematically removed through timber sales and to support heavy recreation use areas. In addition, snags are regularly removed from clearcut logging areas because they present a safety hazard to aerial fertilizers, herbicide applicators, and tree planters.

Current management for primary cavity excavators is designed to provide habitat on a continuing basis at the 40 percent potential population capability level or higher. This is accomplished by identifying small, suitable snag management areas throughout commercial forest land at the time of individual timber sale planning. These areas, plus others, are managed to provide suitable snags on a continuing basis (Forest Service, 1990b).

Effects of the Proposed Action. Primary Cavity Excavators could be negatively impacted during construction of the Pipeline. Direct mortality of young could occur if nest trees are cleared prior to young fledging. Young of acorn woodpeckers remain in nest cavities through early September, young Williamson's sapsuckers and red-breasted sapsuckers fledge by late July, downy woodpeckers remain in nest cavities through late July, and fledgling hairy woodpeckers have been observed in late July (Marshall et al., 2006). Tree felling during those periods could directly impact young birds. While adults would be able to escape temporary disturbances, adult birds could abandon nests, leaving eggs and chicks vulnerable to predation and the elements. To minimize any potential impacts, trees will be felled before April 1 and after July 15, outside of the migratory bird primary nesting season. Tree felling within 0.25 mile of one known NSO activity center and within 1.5 mile of a known peregrine falcon eyrie in the Umpqua National Forest will occur after the breeding period for northern spotted owls, from October 1 to the end of February and outside the breeding period for peregrine falcons (from August 1 through the end of December), respectively. Implementation of this provision will avoid impacts to nesting primary cavity excavators in those areas.

Clearing the right-of-way will modify habitat, changing the seral stage and tree species makeup of occupied forests. Construction will remove 78.24 acres of late successional-old growth Southwest Oregon Mixed Conifer-Hardwood Forest and 0.15 acres of Westside Riparian Forest (Table 2-1). Also, 34.04 acres of late successional-old growth will be affected within UCSAs, but any such impacts will be of limited duration. Additional potential long-term effects to Primary Cavity Excavators will be removal of 30.37 acres of mid-seral conifer-hardwood forest (≥40 years but ≤80 years old), thereby setting back seral development that would be expected to eventually provide suitable habitat elements including snags.

Unlike the large home ranges of pileated woodpeckers, those of the other Primary Cavity Excavator MIS are relatively small, ranging from 10 ha (25 acres) for acorn woodpecker, Lewis's woodpecker, red-breasted sapsucker, downy woodpecker, and hairy woodpecker to 50 ha (124 acres) for Williamson's sapsucker (Johnson and O'Neil, 2001). While the amount of late successional-old growth habitat that would be removed by the Pipeline is not expected to impact local or regional populations of Primary Cavity Excavators, home ranges of several individuals or

pairs could be affected. Since acorn woodpeckers are colonial breeders, multiple individuals could be affected if the Proposed Action removes occupied nesting habitats. Overall, removal of 78.24 acres of potentially suitable primary cavity nester habitat represents approximately 0.01 percent of the 857,196 acres of available habitat on Umpqua National Forest; therefore, no significant impact to this group of species is expected.

If Primary Cavity Excavator MIS' home ranges are assumed to be circular, the diameter of a 25-acre home range would be 1,170 feet and that of a 124-acre home range would be 2,600 feet. Blasting at one edge of a home range would attenuate to 55 dBA (at 1,170 feet) or 46 dBA (at 2,600 feet) at the far edges of the home range, depending on home range size. Noise due to construction would be a short term effect to Primary Cavity Excavators and expected to affect them through home ranges since noise levels would be above ambient levels (assumed to be 40 dBA) throughout species' home ranges that are adjacent to the construction right-of-way.

Mitigation. Mitigation measures that would minimize impacts to pileated woodpeckers include planting trees within the right-of-way after construction, outside of the 30-foot maintenance corridor (within 15 feet of each side of the centerline). After tree planting, there will be 36.66 acres of former forest (20.43 acres of late successional-old growth, 6.04 acres of mid-seral forest, and 10.19 acres of clear cut-regenerating forest) that will remain in an herbaceous and/or shrub state within the 30-foot maintenance corridor during the life of the Pipeline (Table 2-1).

Noise from blasting, if it is required during construction, will be minimized through application of various measures. Mitigation measures commonly applied to blasting of this type include drilling small (2.5-inch) charge holes, stemming the blast holes with sand and placing inert material on top of the blast area (Michael Minor & Associates, 2008).

In the Umpqua National Forest, trees will be felled before April 1 and after July 15, outside of the migratory bird primary nesting season. Where one known spotted owl activity center is within 0.25 mile of the Proposed Action, tree felling will occur outside of the spotted owl breeding season within an approximate 0.4 mile of the proposed construction right-of-way beginning October 1 and continuing through February 28. Additionally, approximately 2.10 miles of the proposed construction right-of-way on Umpqua National Forest will be cleared from August 1 through the end of December within 1.5 miles of a peregrine falcon eyrie outside of the breeding season. Felling trees during these time periods will avoid directly impacting young birds during the nesting season.

To mitigate for loss of cavities and snags within the construction right-of-way, PCGP will create snags in large trees strategically left on the edge of the construction right-of-way by topping and or girdling trees. Previously, PCGP had agreed to fund other projects proposed by the Forest Service in the Umpqua National Forest that would provide benefits to primary cavity excavators within the Umpqua National Forest. The Forest Service will be reviewing these projects to verify their relevance to the current proposed Pipeline and implementation of these previously proposed projects or similar will be included in the CMP. Projects previously agreed to included creating snags and placing large wood in habitats adjacent to the proposed Pipeline to meet the management objectives of snag densities and enhance areas deficient in coarse woody material. The proposal would treat approximately 570 acres and would accelerate the development of late successional habitat characteristics of structure and diversity (snags/large wood) including suitable nesting structures for pileated woodpeckers. The project would also reduce localized fuel loads while improving habitat in deficient stands (large wood) and provide long-term structure in the event of fire since larger logs maintain moisture longer and are less likely to be fully consumed by fire. Additionally, PCGP agreed to fund or implement other projects proposed by

the Forest Service in the Umpqua National Forest such as decommissioning or closing 13 miles of roads, commercial and/or pre-commercial thinning of up to 5,650 acres to accelerate development of late successional and old growth habitat characteristic among other objectives, and reallocating 585 acres from matrix to LSR designation so that forested habitat within former matrix lands will be managed to obtain late successional forest characteristics. Implementation of these or similar projects provide benefits to other primary cavity excavators within the Umpqua National Forest.

PCGP has also prepared a Migratory Bird Conservation Plan that identifies measures that would benefit primary cavity nesters.

Forest Plan Consistency. The Proposed Action will affect forested habitat in Management Area 10 and Management Area 11. PCGP will have to clear snags and downed wood within the construction right-of-way. Removal of snags within either Management Area by the Proposed Action is possible but may be inconsistent with Prescription C5-VI, above.

The Proposed Action is not expected to affect the maintenance of adequate snag habitat within Management Area 10 or 11 and would not limit attaining the 60 percent potential population capability (PPC) for cavity nesters. Prescription C5-VI indicates that new utility corridors may be allowed pending determination by the NEPA process. Removal of snags within either Management Area by the Proposed Action is possible but inconsistent with Prescriptions C5-VII and C5-VIII, above.

2.4 American (Pine) Marten

The pine marten has been identified as an MIS associated with mature or old growth areas in the high elevation (generally greater than 4,500 feet) lodgepole pine and mountain hemlock forest eco-classes.

The following Standards and Guidelines and Management Prescriptions are included in the Forest Plan to conserve and manage for pine martens and their habitat:

Forest Plan Applicable Forest-wide Standards and Guidelines. Broad wildlife coordination guidelines which address leaving snags, down material, unit size, shape, and spatial distribution apply to timber sales and result in the maintenance of habitat (Forest Service, 1990b). Additionally, the direction provides for one habitat area of 160 acres 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.

Management Prescriptions. *Prescription C5-IX, Wildlife – Pine Marten, Dedicated* applies to designated 160-acre areas in the lodgepole pine and mountain hemlock eco-classes. Its purpose is to preserve suitable habitat for pine marten.

- Wildlife and Fish: Vegetation manipulation or structural improvement designed to enhance wildlife is permitted. Activities designed to produce the desired number of snags and dead and down material per acre on a continuing basis will be featured and receive high priority. Areas for nonstructural improvement are the priority for this prescription.
- Timber: No timber harvest or salvage is permitted in the designated 160-acre area. No firewood cutting or gathering is allowed.

- Facilities: Minimal roading to remove trees surplus to those needed to meet habitat requirements is permitted. Roads will be physically closed, scarified, and seeded following use.
- The location of utillty/transportation corridors will not be permitted.
- Protection: No snag removal for pre-suppression purposes. No insect or disease control unless it is catastrophic in nature (threatening 50 percent or more of the stand).

Prescription C5-X, Wildlife – Pine Marten, Managed applies to the same area as C5-X except that for each site identify a 748-acre peripheral area managed on a 175-year rotation. This prescription is applied to timber stands that provide suitable habitat characteristics for the pine martin.

- Wildlife and Fish: Vegetation manipulation or structural improvement designed to enhance wildlife is permitted. Activities designed to produce the desired number of snags and dead and down material per acre on a continuing basis will be featured and receive high priority. Areas for nonstructural improvement are priority for this prescription.
- Timber: Timber stands may be fully managed as long as at least 160 acres at any point in time meets the following criteria: (1) enough mature and old-growth trees will be left to provide >50 percent crown closure, (2) provide two snags, plus six replacement trees, per acre, and (3) maintain an average of six down logs (12' dbh x 20') per acre. Logging and subsequent debris disposal shall not damage more than 30 percent of the minor vegetation, on an area basis.
- Commercial and personal use firewood cutting and gathering are permissible when wildlife management objectives can be met.
- Facilities: Conditions described in C5-IX above apply to selected (160 acres) areas. Replacement areas have no special restrictions during initial 90 years of rotation (50 years for lodgepole). During the remaining rotation period only arterial road will be maintained. Other roads will be obliterated or maintained only to protect soil and water values. No administrative facilities are permitted.
- Utility/transportation corridors may be allowed pending determination by the EA process.
- Protection: No snag removal for pre-suppression purposes. No insect or disease control unless it is catastrophic in nature (threatening 50 percent or more of the stand).

Management Area 10 Direction. Pine marten prescriptions (C5-lX and X) are assigned to locations which meet the distribution requirements set out in the Forest-wide wildlife standards and guidelines. Where these locations overlap other prescription assignments which harvest timber, the managed prescription (C5-X) is assigned. Where these locations overlap other prescription assignments which do not harvest timber, the dedicated prescription (C5-IX) is assigned.

Management Area 11 Direction. Not applicable.

Species Status in the Pipeline Project Area. No systematically collected population data are available for this species (Forest Service, 1990c). However, because little logging activity or other disturbance occurs in its habitat and because annual trapping efforts are moderate to light, it was expected that populations were stable and near habitat capacity (Forest Service, 1990c).

Habitat. The habitat requirement in the Forest is considered to be the mountain hemlock and lodgepole pine types generally above 4,500 feet elevation where ground cover and overhead cover with adequate down trees are available. Large openings (over 100 yards) and areas devoid

of overhead cover are not considered suitable habitat (Forest Service, 1990b). There was an estimate of 121,389 acres of mountain hemlock and lodgepole pine suitable available for pine marten habitat in the Umpqua National Forest in 1990 (Forest Service, 1990c).

Current amounts of pine marten habitat are derived from a habitat suitability model created by Davis and Chapman (2008, Appendix A), as well as a query of data on lodgepole pine and mountain hemlock distribution based upon 2006 imagery (Ohmann et al. 2010, Table 2-6). In 2008, modeled pine marten habitat is 133,483 acres, an increase of 12,094 acres of suitable habitat from the 1990 estimate. While the pine marten is an MIS for mountain hemlock and lodgepole pine, the modeled habitat exceeds the current modeled distribution of mountain hemlock and lodgepole pine habitat (Ohmann et al., 2010) as the habitat model is trained upon observations of pine marten, which includes observations of individuals in dispersal habitat of differing ecoclasses like Douglas-fir and white fir forest types. Therefore the modeled habitat exceeds the acres of mountain hemlock and lodgepole pine distribution, which was the only forest types considered in previous models.

Table 2-6
Amounts of Pine Marten Habitat Modeled by Davis and Chapman (2008), as well as Lodgepole and Mountain Hemlock Habitat Derived from Ohmann et al. (2010)

Pine Marten Habitat Model Classes	**Acres**	**Acres in Protected Lands**	**% Habitat in Protected Lands**
Marginal	85,081	33,004	39
Suitable	38,610	24,772	64
Highly Suitable	9,792	5,575	57
Total	*133,483*	*63,352*	*47*
Lodgepole and Mountain Hemlock Distribution	**Acres**	**Acres in Protected Lands**	**% Habitat in Protected Lands**
Lodgepole or Mountain Hemlock	87,388	35,305	40
Lodgepole and Mountain Hemlock	29,811	18,072	61
Total	*117,199*	*53,378*	*46*

In the Pipeline project area, pine martens have no association with Southwest Oregon Mixed Conifer-Hardwood Forest habitats although they may be present in Westside Riparian Wetlands at high elevations (Johnson and O'Neil, 2001). The presence of pine martens would depend on appropriate structural conditions including snags, down logs, and rock outcrops. A species noted as present in a habitat type indicates that it occasionally uses a habitat that provides only marginal support for its maintenance and viability (Johnson and O'Neil, 2001). The habitats affected by the Proposed Action are not specifically suitable habitats for pine martens.

Forest Management Activities. Fire can negatively affect marten habitat by destroying ground and overhead cover and consuming dead and down material.

Recreation activity was not considered to be heavy enough to influence this species now or in the foreseeable future, at the time of the Forest Plan completion. Trapping of these fur bearing animals over the last 20 years has been light and localized to small areas.

Broad wildlife coordination guidelines which address leaving snags, down material, unit size, shape, and spatial distribution apply to timber sales and result in the maintenance of habitat.

Effects of the Proposed Action. Dispersing pine marten may utilize habitats within the Pipeline project area on Umpqua National Forest (i.e., Douglas-fir and white-fir; see recent habitat modeling efforts in 2008). However, based on habitats/elevation of habitats that will be affected

by the Proposed Action (Southwest Oregon Mixed Conifer-Hardwood Forest) and habitats that are generally utilized by pine martens in the Umpqua National Forest (mountain hemlock and lodgepole pine above 4,500 feet elevation), the Proposed Action is not expected to affect this species in the Umpqua National Forest. Due to the large amount of habitat within protected lands (Table 2-6) and increases in modeling accuracy of suitable pine marten habitat in the Umpqua National Forest, the Umpqua is maintaining a viable amount and distribution of pine marten habitat as described by the 1990 Forest Plan.

2.5 Roosevelt Elk

Roosevelt elk has been identified as an indicator species for their socio-economic importance and as a habitat indicator for big game winter range habitat. This species could be used to evaluate the effects of managed forest conditions and may provide some information for animal communities associated with early successional vegetative stages. Elk also require specific habitat conditions during the winter period (Forest Service, 1990c).

The following Standards and Guidelines and Management Prescriptions are included in the Forest Plan to conserve and manage for Roosevelt elk and their habitat:

Applicable Forest Plan Forest-wide Standards and Guidelines.

- Established big game travel lanes will not have their character altered through precommercial thinning.
- 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.

Management Prescriptions.
Prescription C4-I, for Winter Range—Normal, applies to south-facing areas in the Umpqua National Forest. It includes these areas below 3,500 feet elevation with less than 70 percent slope, as well as other mapped areas.

- Wildlife and Fish: Consider projects designed to enhance forage production such as seeding, planting, and fertilizing. Projects to improve habitat for other wildlife and fish are permitted. The use of K-V funding for this type of work is encouraged.
- Timber: Timber harvest within each subunit of the winter range will be scheduled to best provide a stable, even production of forage and cover. Normally, no less than 8 percent or more of lands suitable for timber production will be cut each decade. Vegetation management activities will consider winter range browse and forage objectives. In winter range areas consider minimal acceptable tree stocking levels. In winter range areas, use spot treatment for release.
- Unit size will average 20 acres or less and units will be shaped to optimize edge. Created openings will be separated by areas not classified as created openings. An area will no longer be considered a created opening when tree height averages 15 feet, except in areas of foreground and middleground where tree height averages 20 feet. Salvage is permitted. Clearcut is the preferred regeneration technique. Felling, yarding, hauling, and road construction may be restricted between December 1 and April 30 if unacceptable impacts to big game animals are expected to occur. Precommercial thinning treatments should insure animal access to at least 50 percent of the area treated.
- Facilities: Dead end local roads and roads not needed to access other areas will be closed during the period Dec. 1 - April 30. Closures may be physical or administrative. Through

roads may be closed from December 1 - April 30 if needed. Limited administrative use may be allowed. Utility/transportation corridors may be allowed.
- Protection: Where possible, broadcast burning is the preferred slash disposal technique. Standard insect and disease control is allowed.

The Four-Part Winter Range—Optimum, Prescription C4-II, also applies to south-facing areas below 3,500 feet with less than 70 percent slope and other mapped areas. This prescription provides for an optimum mix of forage and cover through the application of a combination of rotation lengths to specified percentages of each winter range.

- Wildlife and Fish: Encourage projects designed to enhance forage production such as seeding, planting and fertilizing. Projects to improve habitat for other wildlife and fish are permitted. The use of K-V funding for this type of work is encouraged.
- Timber: The area will be managed as four separate parts. Ten percent will be managed for permanent openings (natural or created). These areas will be seeded to a grass and/or shrub mix. Conifers will be removed to maintain value of the permanent opening.

  (a.) Fifty percent of the area will be managed on a short rotation (60 years). Clearcutting is the preferred regeneration technique. Average unit size will be 20 acres. Vegetation management activities will consider winter range forage and browse objectives. Spot treatments are preferred. May delay release up to five years to maintain productive forage. Maintain minimum acceptable stocking through precommercial and commercial thinning. (b.) Twenty percent of the area will be managed as hiding cover and visual protection from roads with an unmanaged 100-year rotation. No release, precommercial, or commercial thinning unless needed to improve cover values. Clearcutting is the preferred harvest technique. Unit size 20-acre average. (c.) Twenty percent of the area will be managed to produce optimum thermal cover (200 year rotation). Release of stand shall be done in a manner that protects hardwoods and provides multi-level stands. Precommercial thinning of stand is encouraged, but commercial thinning is not permitted. Spatial orientation of these different components is an important element of this prescription. Felling, yarding, hauling, and road construction may be restricted between Dec. 1 and April 30 If unacceptable impacts to big game are expected to occur. (d.) In winter range areas consider minimal acceptable tree stocking levels and use spot treatment for release.
- Facilities: Dead end local roads and roads not needed to access other areas will be closed during the period December 1 through April 30. Closures may be physical or administrative. Through roads may be closed from December 1 through April 30 if needed.
- New utility and transportation corridors will be discouraged, but where no reasonable alternatives exist, corridors will be located to impose the least impact.
- Protection: Where possible, broadcast burning is the preferred slash disposal technique. Appropriate suppression responses will be utilized for all wildfires. Precommercial thinning slash treatment should insure animal access to at least 50 percent of the area treated. Standard insect and disease control is allowed. These are high priority areas for law enforcement.

The Prescription C4-III, Winter Range – Meadow, applies to the Thorn Prairie/Mountain Meadows area of the Diamond Lake Ranger District and is not applicable to the Proposed Action.

Management Areas 10 Direction. Not applicable.

Management Areas 11 Direction. This Management Area includes forest and meadow lands inventoried as suitable winter range. Big game habitat objectives are best met through the management of Prescription C4-II, which is located in the better winter range areas with at least 25 percent of the of the inventoried winter range in each resource scheduling area (RSA) assigned to it. Prescription C4-I is assigned to lands suitable for timber production which are not needed for other wildlife habitat objectives. At least 20 percent of the land in this prescription assignment needs to be in Stage 5 or Stage 6 vegetation.

Species Status in the Project Area. Big game inventories in the Umpqua National Forest are conducted by the Oregon Department of Fish and Wildlife (ODFW). Inventory methods include spotlight sampling, aerial counts of wintering elk, analysis of harvest data, and population modeling. Forest population (as determined by the ODFW at the time of the Forest Plan release) varies annually, but the numbers center around 2,000 Roosevelt elk. The following ODFW wildlife management units occur in the Umpqua National Forest: Dixon, Indigo, and Evans Creek.

ODFW's Evans Creek Wildlife Management Unit 29 coincides with the portion of the Umpqua National Forest within which the Proposed Action is located (MPs 99.32 to 113.23). ODFW (2018a) has compiled harvest data on Roosevelt elk within Wildlife Management Unit 29 through 2016 (ODFW, 2018a). In the 2012 harvest, hunters had about twice the success rate as during the previous four years in Management Unit 29 (Table 2-7).

Table 2-7
Harvest Statistics for Roosevelt Elk within the
Evans Creek Wildlife Management Unit 29, 2003-2016

Year	Total Hunters	Total Hunter Days	Harvest			Days per Harvest	Percent Hunter Success
			Total Males (antlered)	Total Non-Males (non-antlered)	Total		
2016	151	not reported	10	20	30	not available	20
2015	521	not reported	27	15	42	not available	8
2014	502	2992	33	18	51	59	10
2013	557	2948	39	28	67	44	12
2012	577	3294	37	13	50	66	9
2011	474	2656	28	49	77	34	16
2010	444	2807	16	32	48	58	11
2009	552	2845	49	34	83	34	15
2008	377	2632	23	4	27	97	7
2007	579	3162	26	5	31	102	5
2006	267	1723	26	4	30	57	11
2005	304	1500	43	1	44	34	14
2004	428	2276	36	16	52	44	12
2003	426	3049	21	27	48	64	11

The population data for Roosevelt elk in Wildlife Management Unit 29 are limited (ODFW, 2018b); however, the recent numbers of calves per adult cow (young per adult female) appear to have declined from 2000-2001 when the highest calf production was documented since 1998 (Figure 2-2). Using data from 1998 through 2016, the declining trend is significant ($p<0.05$; see Figure 2-2).

Decreasing productivity appears to be consistent with an overall declining rate of population growth of Roosevelt elk in Evans Creek Wildlife Management Unit 29. In the past, ODFW has conducted population trend counts of elk along a fixed route near the end of winter but no count data are available since 2006 (ODFW, 2018b).

In other ODFW wildlife management units in the Umpqua National Forest (Dixon and Indigo Unit) not crossed by the Pipeline, elk are meeting the ODFW management objectives; therefore, populations of Roosevelt elk in the Umpqua National Forest are being maintained at viable levels to ensure their continued existence in the Forest.

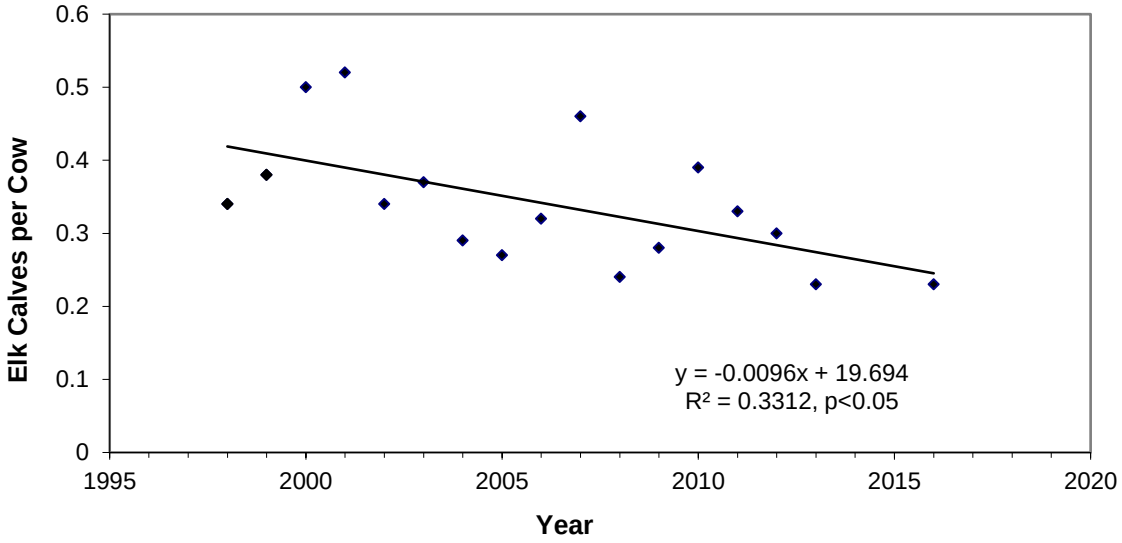

Figure 2-2
Trend in Productivity (Calf per Adult Cow) of Roosevelt Elk in the Evans Creek Wildlife Management Unit 29 Which Coincides with the PCGP Route in the Umpqua National Forest (data from ODFW, 2018b)

Habitat. Elk depend on a mosaic of early forage-producing and later cover-forming stages of forest in close proximity. Clearcuts can be primary foraging areas, with peak production and use about five to eight years after logging (Verts and Carraway, 1998). Approximately 90 percent of use of foraging areas by elk occurs within about 400 feet of cover sufficient to hide 90 percent of a standing elk at 200 feet. This cover may be provided by later stages of shrub and open sapling stand stages, and later stages of forest. For thermal cover, forested areas with trees about 40 feet or taller with about 70 percent canopy closure are preferred in both summer and winter. Nearly all thermal cover habitat is within about 1,200 feet of foraging areas (Verts and Carraway, 1998). Winter range for elk occurs at elevations less than 3,500 feet and usually on slopes with southerly aspect. An exception occurs in the Diamond Lake Ranger District where animals winter at somewhat higher elevations. Elk wintering occurs almost entirely on Umpqua National Forest land. In 1990, the Umpqua National Forest Plan estimated that there were approximately 202,371 acres of areas having conditions capable of providing winter habitat for elk. Early successional stages are considered prime forage producing areas, the mid-stages can provide hiding cover and thermal cover, and the late stages provide optimum thermal cover (Forest Service, 1990c).

Roosevelt elk have general associations with Southwest Oregon Mixed Conifer-Hardwood Forest and Westside Riparian Wetlands habitats (Johnson and O'Neil, 2001), both of which are present within the Pipeline project area. Summer elk forage consists of a combination of lush forbs, grasses, and shrubs, which is usually attained at higher elevations within wet meadows, springs, and riparian areas in close proximity to forested stands. Forage becomes less abundant and accessible in winter and the nutritional quality declines. Winter range is usually within forested sites which provide protection against weather, as well as lichens and other plants used as forage (ODFW, 2003a). The Proposed Action will cross 0.62 mile of big game winter range in the Umpqua National Forest.

Nearly the entire Umpqua National Forest has the potential to be suitable elk habitat, either as summer range or winter range. Summering occurs on most areas of the Forest, although habitat quality and animal distribution vary considerably. The highest use occurs in areas where forage-producing openings are in proximity with suitable cover. Summer range forage is not limiting current or future population growth. Adequate usable winter forage is considered to be the limiting factor to deer and elk populations (Forest Service, 1990c).

Forest Management Activities. Historically, elk populations and their distribution were dependent on naturally occurring fires, wind storms, or insect infestations that created openings in the more or less uniform timber stands. Early fire protection efforts, until the early 1950s, appear to have resulted in depressed elk numbers. Available evidence indicates that low numbers of elk did occur within the Forest, mostly at high elevations in the Diamond Lake District and in the Rogue-Umpqua Divide area. With increased logging and the resulting openings, fire suppression efforts are no longer a significant factor in suppressing elk numbers and may be beneficial from the standpoint of protecting and maintaining cover areas.

Herbicides can affect big game animals in several ways; if extensive, continuous areas are treated at one time, a shortage of forage can occur. However, if herbicide use is timed to occur when target brush species have grown out of reach of the animals, the resprouting that results can be beneficial.

Other human influences can be considered in three broad areas: (1) mortality, (2) harassment, and (3) habitat impacts. Mortality occurs during the hunting season, through poaching, and by accidents with vehicles. Harassment is a significant factor during winter months when animal energy reserves are low. In areas where activities such as recreation or logging take place, unintentional harassment may occur.

The objective is to provide maximum forage utility while maintaining suitable cover in close proximity to foraging areas. In addition, winter range management involves scheduling timber harvest activities to ensure adequate forage and cover through time, controlling disturbance and harassment during critical periods, and identifying enhancement opportunities.

Effects of the Proposed Action. Direct mortality of Roosevelt elk due to the Proposed Action is possible if vehicles collide with animals traveling to and from construction sites. Numerous studies have shown that both Rocky Mountain elk and Roosevelt elk are sensitive to human disturbances such as motorized travel on and off roads (Rowland et al., 2000). Roads are generally avoided by elk when they are open, but are heavily utilized by elk as travel corridors when closed. Several herds of elk are known to winter on the western slopes of the Cascades (ODFW, 2003a). In general, deer and elk return to habitats from which they have vacated within a relatively short period of time which would likely depend on the time of year, available hiding cover, and duration of local disturbances.

Construction of the Pipeline will remove 143.82 acres of forested habitat (Table 2-1) including approximately 78.24 acres of late successional-old growth, 30.37 acres of mid-seral forest, and 35.22 acres of clearcut-regenerating forest within the Umpqua National Forest. This includes approximately 9.24 acres of big game winter range in the Umpqua National Forest. Roosevelt elk are likely to be generally associated with the Southwest Oregon Mixed Conifer-Hardwood Forest type affected and all structural conditions of affected forest (shrub-seedling, small tree, medium tree, large tree, giant tree; single and multi-story forests; open, moderate, and closed canopy forests). An additional 41.70 acres of forested habitat would be affected in the short-term within UCSAs. The Pipeline will also remove 0.15 acre of Forested Wetland and 12.05 acres of developed urban environs. Roosevelt elk are generally associated with a variety of Westside Riparian Wetland structural conditions and low density urban conditions (Johnson and O'Neil, 2001). Given that Roosevelt elk are such generalists, effects to any one type of structural habitat condition with replacement by another structural stage (e.g. shrub-seedling, grass-forb) will not adversely affect the species.

A study conducted in Alberta (Brusnyk and Westworth, 1985) focused on forage and browse production on a 17-year old pipeline right-of-way and on a 2-year old pipeline right-of-way. They compared big game use (moose, deer, and elk) of forage on the two rights-of-way to use in adjacent undisturbed forest ecotones and undisturbed forest. Browse production was most extensive on the 17-year old corridor which was utilized most by moose (though they are not present in the Pipeline project area).

Elk utilized forage on the 2-year old right-of-way primarily where portions were adjacent to forested habitats. The principal conclusion of this study was that pipeline corridors increased local habitat diversity and that diversity – juxtapositions of browse or forage to undisturbed forested habitat – influenced use of the corridors by ungulates, not necessarily due to increased vegetative production, *per se,* within pipeline rights-of-way (Brusnyk and Westworth, 1985). Following reclamation of the pipeline corridor, Roosevelt elk may utilize the corridor for travel and for foraging, depending on vegetation species planted and rapidity of successful revegetation.

After construction of the Pipeline, there will possibly be a secondary impact (Comer, 1982) on harvest rates with upgraded access to previously inaccessible areas; hunters are expected to achieve greater success, at least temporarily, with increased access. Big game species utilizing a cleared right-of-way, vegetated with herbaceous species, are more likely to be harvested than animals in forested habitat. Increased public recreation along the right-of-way in the fall hunting season, especially along access points, has been documented elsewhere (Crabtree, 1984).

Access could increase poaching of game animals and nongame wildlife on a local level. Enforcement of wildlife regulations is the responsibility of the Oregon State Police, Fish and Wildlife Division. There is no information to relate poaching effects to wildlife population status.

Mitigation. Timber felling will occur before April 1 and after July 15, outside of the migratory bird primary nesting season and would occur concurrent, but prior to construction, with the exception of approximately 3.7 miles of timber that will be cleared in the fall / winter in areas within 0.25 mile of NSO activity centers and within 1.5 mile of peregrine falcon eyries (beginning in fall 2015). However, this area with NSO and peregrine presence is outside of big game winter range on Umpqua National Forest and should not affect use of winter range by elk. Construction and timber felling activities are scheduled to reduce impact to migratory birds nesting in standing trees, take advantage of the drier periods of the year to minimize winter construction, to reduce potential environmental impacts and construction safety risks, and ultimately reducing disturbance to elk utilizing big game winter range. Restoration of construction disturbance is expected to begin once

construction is completed. Restoration would start in the fall and would be completed by the end of the winter season when forest, wetland, and riparian plantings would be installed. Depending on site-specific conditions, it may be necessary to continue restoration through the spring. As required by FERC's Upland Plan, PCGP consulted with the NRCS, the BLM, and the Forest Service regarding specific seeding dates and recommended seed mixtures for the Pipeline project. The recommendations have been incorporated into the Pipeline-specific ECRP. The ECRP describes the procedures that will be implemented to minimize erosion and enhance revegetation success, the procedures that will be utilized to minimize the spread of noxious weeds as a result of construction, and the silvicultural prescriptions that will be implemented in areas that are outside the permanent easement. Seeding mixtures and inhibition of noxious weeds will enhance forage production.

To minimize potential entrapment of deer and elk within the open trenches during construction within delineated big-game winter and summer range, PCGP will leave trench segments (>5 feet wide) of the proposed alignment untrenched and herbaceously vegetated (every 0.5 mile and at visible wildlife game trails) to serve as a route (i.e., green bridge or landscape connector) for big game across the construction right-of-way until pipe is ready to be installed (Forman et al., 2003). Alternatively, PCGP will install soft plugs (backfilled trench materials) in the trench after excavation at these distances to provide wildlife passage. Additionally, 20-foot gaps will be left in spoil and topsoil stockpiles at all hard or soft plug locations and a corresponding gap in the welded pipe string will be left in these locations. Suitable ramps will be installed from the bottom of the trench to the top to prevent potential wildlife entrapment within the trench.

Vegetation management over the long-term will benefit winter range browse and forage for Roosevelt elk. Approximately 36.66 acres of vegetation within the 30-foot maintenance corridor will be periodically maintained by mowing, cutting, and trimming (either by mechanical or hand methods). In upland areas, the permanent easement will be maintained in a condition where trees or shrubs greater than 6 feet tall will be controlled (cut or trimmed) within 15 feet on either side of the centerline (for a total of 30 cleared feet). Maintenance activities are expected to occur approximately every 3-5 years depending on the growth rate of vegetation. During maintenance, vegetation will be cut/trimmed in 4 to 6-foot lengths and scattered across the permanent easement to naturally decompose and to discourage OHV traffic, as well as benefit wildlife habitat. Vegetation management over the long-term will benefit winter range forage for Roosevelt elk.

Approximately 9.24 acres of forested habitat within sensitive big game winter range will be affected within the Umpqua National Forest. However, PCGP will revegetate 6.99 acres of the affected area with trees, to eventually provide a similar vegetative community as was present prior to timber clearing. The remaining 2.25 acres of affected forest will be converted to an herbaceous/shrub vegetative cover for the long-term within the 30-foot maintenance corridor during Pipeline operation, increasing the amount of forage available to big game adjacent to forested stands potentially used for thermal cover.

Forest Plan Consistency. In the Umpqua National Forest, big game winter range timing limitations are from December 1 through April 30. Construction activities would occur within approximately 0.62 mile of designated big game winter range in the Umpqua National Forest and could occur during those timing limitations. However, PCGP would target the drier periods of the year to construct, where possible, which would minimize disturbance to Roosevelt elk within designated habitat during that period. Big game travel lanes will not be blocked by construction or operation of the Proposed Action. Roosevelt elk are expected to utilize the pipeline right-of-way for travel and foraging. Prescription C4-II allows for the possibility of new utility and transportation corridors,

although discouraged, if no reasonable alternatives exist. The Proposed Action would be consistent with the Forest Plan.

2.6 Columbian Black-tailed Deer

The Columbian black-tailed deer has been identified as an indicator species for its socio economic importance and as a habitat indicator for big game winter range habitat. This species has a high level of public interest associated with hunting and requires specific habitat conditions during the winter period.

The following Standards and Guidelines and Management Prescriptions were identified in the Forest Plan to conserve and manage for Columbian black-tailed deer and their habitat:

Applicable Forest Plan Forest-wide Standards and Guidelines.

- Established big game travel lanes will not have their character altered through precommercial thinning.
- 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.

Management Prescriptions. Management prescriptions for big game described above for Roosevelt elk also apply to Columbian black-tailed deer.

Management Areas Direction. Management area direction for big game described above for Roosevelt elk also apply to Columbian black-tailed deer.

Species Status in the Pipeline Project Area. Long-term, systematically collected data are available for this species, collected annually by the Oregon Department of Fish and Wildlife. Data are collected on population trends, sex ratios, winter mortality, and harvest. Forest-wide populations are estimated by the ODFW to be between 8,000 and 14,000 animals. The following ODFW wildlife management units occur in the Umpqua National Forest: Dixon, Indigo, and Evans Creek.

ODFW's Evans Creek Wildlife Management Unit 29 coincides with the portion of the Umpqua National Forest within which the Proposed Action is located (MPs 94.69-122.61). ODFW (2018a) has compiled harvest data on black-tailed deer within Wildlife Management Unit 29 through the 2016 harvest season (ODFW, 2018a). From 2003 through 2016, percent hunter success has been relatively consistent (Table 2-8).

Table 2-8
Harvest Statistics for Black-Tailed Deer within the Evans Creek Wildlife Management Unit 29, 2003-2011

Year	Total Hunters	Total Hunter Days	Harvest			Days per Harvest	Percent Hunter Success
			Total Males (antlered)	Total Non-Males (non-antlered)	Total		
2016	2,693	not reported	809	32	841	not available	31
2015	2,736	not reported	788	40	828	not available	30
2014	2,697	18,935	789	35	824	23	31
2013	2,836	19,180	722	23	745	26	26

Year	Total Hunters	Total Hunter Days	Harvest			Days per Harvest	Percent Hunter Success
			Total Males (antlered)	Total Non-Males (non-antlered)	Total		
2012	2,616	18,591	699	3	702	26	27
2011	2391	15844	758	31	789	20	33
2010	2922	19252	795	52	847	23	29
2009	3223	21504	851	39	890	24	28
2008	3158	20685	953	30	983	21	31
2007	2916	18488	842	41	883	21	30
2006	2709	16827	735	29	764	22	28
2005	2234	14801	791	25	816	18	37
2004	2429	14980	674	31	705	21	29
2003	2673	18006	749	28	777	23	29

Similar to Roosevelt elk in Wildlife Management Unit 29, the black-tailed deer population appears to be decreasing during the period 1998 to 2012. There is no significant trend in fawns per doe (young per adult female) but there is a significant decreasing trend ($p<0.01$) in ODFW's Trend Count Index for deer in the Hunt Area which is conducted along a fixed route each year, usually at the end of winter (Table 2-9). In addition to fall composition count surveys, ODFW (2018b) has also conducted annual spring composition counts that provided ratios of young per adult deer (adult bucks and does). The two ratios of young per adult (fall Ratio A and spring Ratio B in Table 2-9) allow estimation of young overwinter survival relative to adult overwinter survival. Those estimates are included in Table 2-9 and indicate that juvenile black-tailed deer in the Evans Creek Wildlife Management Unit 29 have had very high overwinter survival rates relative to adult deer - estimates near or greater than 1 - since 1998. ODFW has not provided any similar, additional data for black-tailed deer since 2012 and more recent trends in population growth, productivity, and overwinter survival are unknown.

In other ODFW wildlife management units in the Umpqua National Forest (Dixon and Indigo Unit) not crossed by the Pipeline, black-tailed deer are meeting the ODFW management objectives; therefore, overall populations of black-tailed deer in the Umpqua National Forest are being maintained at viable levels to ensure their continued existence in the Forest.

Table 2-9
Population Trends, Annual Productivity, and Estimated Overwinter Survival for Juvenile Black-tailed Deer within the Evans Creek Wildlife Management Unit 29, 1998-2012

Year	Population Index [1]	Young per Adult Female [2]	Young per Adult – Fall (Ratio A) [3]	Young per Adult – Spring (Ratio B) [4]	Maximum Overwinter Juvenile Survival Rate [5]
2012	3.8	0.60	0.47	0.67	1.76
2011	2.5	0.47	0.38	0.38	1.01
2010	4.1	0.46	0.37	0.60	1.38
2009	5.5	0.55	0.43	0.58	1.26
2008	5.1	0.58	0.46	0.63	1.32
2007	-	0.61	0.48	-	-
2006	5.0	0.68	0.54	0.59	1.21

Year	Population Index [1]	Young per Adult Female [2]	Young per Adult – Fall (Ratio A) [3]	Young per Adult – Spring (Ratio B) [4]	Maximum Overwinter Juvenile Survival Rate [5]
2005	5.1	0.60	0.49	0.71	1.81
2004	-	0.52	0.39	0.30	0.92
2003	6.3	0.41	0.33	0.48	0.96
2002	0.0	0.62	0.50	0.67	1.27
2001	3.0	0.60	0.53	0.37	0.97
2000	3.6	0.48	0.38	0.53	0.94
1999	3.8	0.70	0.57	0.70	1.64
1998	2.7	0.53	0.43	0.42	-

[1] **Population Index** is ODFW's Trend Count for the Hunt Area which is conducted along a fixed route each year, usually at the end of winter (ODFW, 2018b).
[2] **Productivity** data is young per female from ODFW's Composition Count data reported as Young per 100 Females counted in December (ODFW, 2018b).
[3] **Ratio A** (White et al., 1996) is the ratio of Young per Adult, derived from Composition Count data (Males per 100 Females and Young per 100 Females) counted in December (ODFW, 2018b).
[4] **Ratio B** (White et al., 1996) is the ratio of Young per Adult (Young per 100 Adults) counted in March (ODFW, 2018b).
[5] **Maximum Overwinter Juvenile Survival** is related to ratios ***A*** and ***B*** and to the following relationship of adult over-winter survival rate ($\hat{S}_a$) and juvenile over-winter survival rate ($\hat{S}_j$) by the formula (see equation 9 in Paulik and Robson, 1969): $\hat{S}_j / \hat{S}_a = \boldsymbol{B}/\boldsymbol{A}$ or $\hat{S}_j = \hat{S}_a\ (\boldsymbol{B}/\boldsymbol{A})$. Since many of the estimates of maximum juvenile survival rates are greater than 1, they indicate survival of adults was less than juveniles over winter which is highly unlikely.

Habitat. Black-tailed deer prefer early successional stages created by clearcuts or burns, providing grasses, forbs, and shrubs (ODFW, 2003b; Csuti et al, 2001). Most black-tails summering in the high Cascades winter at lower elevations on the west slope, although some wintering may occur east of the Cascade crest (ODFW, 2003b). Winter range for black-tail deer occurs at elevations less than 3,500 feet and usually on slopes with southerly aspect. An exception occurs in the Diamond Lake Ranger District where animals winter at somewhat higher elevations. Some wintering of black-tail deer occurs on private land, but the number of animals doing so is not large enough to justify detailed analysis. In 1990, the Umpqua National Forest Plan estimated that there are approximately 202,371 acres of areas having conditions capable of providing winter habitat for black-tail deer. Early successional stages are considered prime forage producing areas, the mid-stages can provide hiding cover and thermal cover, and the late stages provide optimum thermal cover (Forest Service, 1990c).

Black-tailed deer have general associations with all habitats that are present in the Pipeline project area including Southwest Oregon Mixed Conifer-Hardwood Forest and Westside Riparian Wetlands habitats (Johnson and O'Neil, 2001). Most black-tails that summer in the high Cascades winter at lower elevations on the west slope, although some wintering may occur east of the Cascade crest (ODFW, 2003b). Winter loss of black-tailed deer is generally far less than for mule deer, because the snow does not remain on the valley floors for extended periods and a crust does not form on the surface as it does on the east side of the Cascades (ODFW, 2003b). The Proposed Action will cross 0.62 mile of big game winter range in the Umpqua National Forest.

Forest Management Activities. Historically, black-tailed deer follow patterns similar to those of the Roosevelt elk. Historic populations were highest in areas of naturally occurring fires, windstorms, and insect infestations that created openings in fairly uniform timber stands. In addition, low numbers of deer could be found in old growth forests. The effects of controlling

naturally occurring wildfire can be considered as limiting the amount of optimal habitat available for black-tailed deer, although under the current management, this shortfall in habitat has been compensated for by openings created through logging. The burning of debris following logging is considered positive black-tail management.

In 2015, a large stand-replacing fire (the Stouts Creek fire) burned approximately 26,452 acres on Roseburg BLM District, Umpqua National Forest, and some private landowners (Northwest Interagency Coordination Center 2015). Umpqua National Forest created a fire break within the fire boundary on 0.7 mile (7.90 acres) of the Proposed Route in clearcut/regenerating forest from approximately MP 106.8 to MP 108.8. The fire and related management activities likely increased acreage of suitable forest for the black-tailed deer.

The influence of humans on black-tailed deer are similar to those discussed for Roosevelt elk and involve (1) direct mortality, (2) harassment, and (3) habitat modification. Mortality occurs through legal and illegal hunting and by accidents with motor vehicles. Harassment of deer during the winter months when energy reserves are low is not as much of a concern as with elk because they do not tend to herd and are generally less visible.

Winter weather and habitat conditions appear to be the main factor controlling overall population numbers. Extreme winter weather can significantly reduce populations.

Timber harvesting in low elevation areas (below 3,500 feet) creates considerable acreage of suitable forage. After timber harvest there is an initial surge of productive forage followed by declines in forage production once stands have reached pole-sapling size.

Current deer management is keyed to the harvest and management of timber stands and emphasizes the production of suitable forage and cover on a sustained basis. Most of the Forest's winter range areas have been identified and general management guidelines are applied to them. The objective is to provide available forage and suitable cover in close proximity. In addition, the management of winter ranges involves scheduling timber harvest activities to insure adequate forage and cover through time, controlling disturbance and harassment during critical periods, and identifying habitat enhancement opportunities.

Effects of the Proposed Action. Direct mortality of black-tailed deer due to the Proposed Action is possible if vehicles collide with animals traveling to and from construction sites. Similar to mule deer, vehicle collisions with black-tailed deer may increase with traffic volume, particularly during winter (Arnold, 1978; Reed, 1981; Romin and Bissonette, 1996). Black-tailed deer are likely to avoid access roads and construction areas similar to mule deer which generally avoid roads (Rost and Baily, 1979). In general, deer and elk return to habitats from which they have vacated within a relatively short period of time which would likely depend on the time of year, available hiding cover, and duration of local disturbances.

Potential impact to black-tailed deer from noises generated from construction activities may be similar to mule deer and can be evaluated to an extent, such as noise from vehicles and/or increased road traffic, blasting, and aerial fly-overs. For example, effects of short-duration seismic exploration (blasting) have been documented. Mule deer respond with alert postures, occasionally running for short distances, but did not shift home ranges or otherwise avoid seismic blast 2 miles away (Ihsle, 1982). Mule deer did avoid areas of seismic exploration that were closer (0.6 mile away) but whether avoidance was due to human presence, noise, or a combination was not distinguishable (Horejsi, 1979).

Construction of the Pipeline will remove 143.82 acres of forested habitat (Table 2-1) including approximately 78.24 acres of late successional-old growth, 30.37 acres of mid-seral forest, and 35.22 acres of clearcut-regenerating forest. This includes approximately 9.24 acres of big game winter range in the Umpqua National Forest. Black-tailed deer are likely to be generally associated with the Southwest Oregon Mixed Conifer-Hardwood Forest type affected and all structural conditions of affected forest (shrub-seedling, small tree, medium tree, large tree, giant tree, single and multi-story forests, open, moderate, and closed canopy forests). An additional 41.70 acres of forested habitat would be affected in the short-term within UCSAs. The Pipeline will also remove 0.15 acre of Forested Wetland and 12.05 acres of developed urban environs. Black-tailed deer are generally associated with a variety of Westside Riparian Wetland structural conditions and low density urban conditions (Johnson and O'Neil, 2001). Given that black-tailed deer are such generalists, effects to any one type of structural habitat condition with replacement by another structural stage (e.g. shrub-seedling, grass-forb) will not adversely affect the species.

A study conducted in Alberta (Brusnyk and Westworth, 1985) focused on forage and browse production on a 17-year old pipeline right-of-way and on a 2-year old pipeline right-of-way. They compared big game use (moose, deer and elk) of forage on the two rights-of-way to use in adjacent undisturbed forest ecotones and undisturbed forest. Browse production was most extensive on the 17-year old corridor which was utilized most by moose (though they are not present in the Pipeline project area).

Deer appeared to utilize browse in the 17-year old corridor but returned to adjacent undisturbed forest, probably utilizing available hiding or thermal cover. Deer utilized the corridors for travel in early winter prior to limiting snow depths. The principal conclusion of this study was that pipeline corridors increased local habitat diversity and that diversity – juxtapositions of browse or forage to undisturbed forested habitat – influenced use of the corridors by ungulates, not necessarily due to increased vegetative production, *per se,* within pipeline rights-of-way (Brusnyk and Westworth, 1985). Following reclamation of the pipeline corridor, black-tailed deer may utilize the corridor for travel and for foraging, depending on vegetation species planted and rapidity of successful revegetation.

After construction, there will possibly be a secondary impact (Comer, 1982) on harvest rates with upgraded access to previously inaccessible areas; hunters are expected to achieve greater success, at least temporarily, with increased access. Big game species utilizing a cleared right-of-way, vegetated with herbaceous species, are more likely to be harvested than animals in forested habitat. Increased public recreation along the right-of-way in the fall hunting season, especially along access points, has been documented elsewhere (Crabtree, 1984).

Access could increase poaching of game animals and nongame wildlife on a local level. Enforcement of wildlife regulations is the responsibility of the Oregon State Police, Fish and Wildlife Division. There is no information to relate poaching effects to wildlife population status.

Mitigation. Mitigation proposed for Roosevelt elk would also benefit black-tailed deer.

Forest Plan Consistency. In the Umpqua National Forest, big game winter range timing limitations are from December 1 through April 30. Construction activities would occur within approximately 0.65 mile of designated big game winter range in the Umpqua National Forest and could occur during those timing limitations. However, PCGP would target the drier periods of the year to construct, where possible, which would minimize disturbance to Columbian black-tailed deer within designated habitat during that period. Similar to management of Roosevelt elk, the

Proposed Action would be consistent with the Forest Plan Standards and Guidelines, Management Prescriptions, and Management Area Directions related to black-tailed deer.

Since there is no significant trend in fawns per doe (young per adult female), but there is a declining trend ($p<0.01$) in ODFW's Trend Count index for deer in the Evans Wildlife Management Unit 29 **(**Table 2-9); however, there is no reason to expect that deer winter range carrying capacity in the Forest would be limited by the Proposed Action. Indeed, estimated young overwinter survival relative to adult overwinter survival indicates that juvenile black-tailed deer in the Evans Wildlife Management Unit 29 have had very high overwinter survival rates relative to adults (Table 2-9), which may indicate carrying capacity objectives of the Forest are being achieved. The Proposed Action would be consistent with the Forest Plan.

2.7 Peregrine Falcon

The peregrine falcon was identified as an indicator species because it was classified as an endangered species under the Endangered Species Act of 1973 (ESA) when the Forest Plan was developed. With the banning of DDT and other chlorinated hydrocarbons and successful captive breeding, rearing, and release of over thousands of peregrines annually, FWS (1999a) determined that the species had recovered and removed peregrine falcons from the list of Threatened and Endangered Species in 1999. Although no longer listed as threatened under the ESA, peregrine falcons remain protected under the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-712).

The following Standards and Guidelines and Management Prescriptions were identified in the Forest Plan to conserve and manage for peregrine falcons and their habitat:

Applicable Forest Plan Forest-wide Standards and Guidelines.

- All proposed activities within areas designated for management under the bald eagle or peregrine falcon prescription will first be coordinated with the USFWS as required by consultation procedures.

Management Prescriptions. Forest Plan *Prescription C3-1, Peregrine Falcon*, applies to known and selected potential peregrine falcon nest sites and the area within a three-mile radius of nest site. It is intended to meet the requirements of the Endangered Species Act of 1973. However, since the species has been delisted, consultation with the FWS may no longer be required for projects which could have an impact on it.

- 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 FWS.
- Timber: No programmed harvest within the immediate vicinity of the nest site. Restrict timber harvest activity between January 1 and July 31 as needed to reduce disturbance during nesting season. Within a 1.5-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-mile zone with FWS. Within a 3-mile radius of a 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.
- Facilities: Roads within 1.*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.

- Protection: No use of chemicals to control insect and disease outbreaks within the 1.5-mile radius except under recommendation from FWS.

Management Area 10 Direction. Inventoried sites for peregrine falcons on MA 10 are assigned to Prescription C3-I.

Management Area 11 Direction. Not applicable.

Species Status in the Pipeline Project Area. The Umpqua National Forest Plan monitoring calls for annual monitoring of all known peregrine falcon sites, and to report the number of active nests. When the Umpqua Forest Plan was finalized in 1990, there were seven known nesting pairs, and in 2011 there were 16 known nesting pairs in the Umpqua National Forest that have fledged 183 young since 1990. The Umpqua National Forest is now considered a source population for peregrine falcons in southwestern Oregon, and the peregrine reproduction has been increasing with numbers of eyries detected, as well as number of young fledged. Therefore, the peregrine population in the Umpqua is being maintained at a viable level, with a positive trend in population size in the Umpqua National Forest.

A peregrine falcon eyrie in the Umpqua National Forest within the vicinity of the Proposed Action has been active for several years. The eyrie is approximately 0.2 mile southwest of PCGP Milepost (MP) 112.65 (T32S, R2W, Section 35).

Habitat. Throughout its vast range, the peregrine falcon has adapted to a wide array of nesting and prey habitats. In Oregon, the bird is found to nest on cliffs ranging in height from 75 to 1500 feet, as well as man-made structures such as bridges (Marshall et al., 2006). The average occupied cliff size in the Cascade Mountain Range is 229 feet. Cliff nests are on ledges or potholes with and without protective overhangs (Marshall et al., 2006). Nests previously built and occupied by ravens, golden eagles, and red-tailed hawks have also been located as nesting spots for falcons in Oregon (Marshall et al., 2006).

Peregrine falcons are associated with Westside Riparian-Wetlands and Southwest Oregon Mixed Conifer-Hardwood Forest habitats, both of which occur in the Umpqua National Forest and are crossed by the Proposed Action.

Forest Management Activities. The influence of fire and timber harvest can be considered in two ways: (1) as they affect the nest site and (2) as they affect the food base. Fire or harvest in the immediate vicinity of the nest site can be detrimental, if the site is severely modified so that it may no longer be suitable. To some extent, how much disturbance would be tolerated depends on the quality of the site and the characteristics of the individual birds. Because peregrines are long-ranging birds, fire or logging will not significantly affect the food base and may actually increase the food base if it results in an increase in the passerine (songbird) bird population.

Unusual or prolonged disturbance of nesting birds can lead to reproductive failure. The species' intense defensive behavior plus the high public interest in this species warrant limiting disturbance during the courtship and nesting period. Any changes in the characteristics of the nest site, through logging or road construction, would also be detrimental to the birds.

Effects of the Proposed Action. Since the Forest Plan was issued and peregrine falcons were delisted, the Umpqua National Forest has adopted new temporal and spatial buffers to protect peregrine falcon eyries. No disturbances are allowed within 1.5 miles of active nest sites from February 1 through August 31. Since the eyrie is at a higher elevation than the construction right-of-way and there is likely no intervening tree cover, noise generated by construction at the eyrie is predicted to range from 45 dBA (centerline surveying of the ditch) to 66 dBA (ditching with mitigated rock blasting) at the closest distance of 0.2 mile. That noise level is likely to be below levels (85 dB) that normally scare birds (Golden et al., 1980).

Disturbance of the adults could lead to egg or chick abandonment, leaving them vulnerable to predators and the elements. In extreme cases of disturbance, for example the sudden appearance of a human or machinery very close to a nest, the adult may leave so quickly as to knock eggs or chicks out of the nest (White et al., 2002).

Mitigation. PCGP would apply the spatial buffer to approximately 2.10 miles of the PCGP construction right-of-way in the Umpqua National Forest, from MP 111.12 to MP 113.22, to avoid potential impacts to a nesting peregrine falcon. No timber clearing or construction activities would occur within 1.5 miles of the active peregrine falcon eyrie from February 1 through August 31.

Forest Plan Consistency. Since Peregrine Falcons are no longer listed under the ESA, Forest Plan Prescription C3-I, Peregrine Falcon, intended to meet the requirements of the Endangered Species Act of 1973, is no longer applicable. The Proposed Action will be consistent with current temporal and spatial buffers to protect peregrine falcon eyries in the Umpqua National Forest. And, as noted above, the peregrine population in the Umpqua is being maintained at a viable level, with a positive trend in population size in the Umpqua National Forest.

2.8 Bald Eagle

The bald eagle was chosen as a MIS for the Forest because it was classified as a threatened species under the ESA (Forest Service, 1990b). However, the species is no longer listed under the Act. Although no longer listed as threatened under the ESA, bald eagles remain protected under the Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668d) and the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-712).

The following Standards and Guidelines and Management Prescriptions were identified in the Forest Plan to conserve and manage for bald eagles and their habitat:

Applicable Forest Plan Forest-wide Standards and Guidelines.

- Active raptor nest sites identified in project planning or during project work should be protected from human disturbance until fledging or nesting is complete.
- All proposed activities within areas designated for management under the bald eagle prescription will first be coordinated with the FWS as required by consultation procedures.

Management Prescriptions. *Prescription C3-II, Bald Eagle, Maintained,* applies to areas within a 20-chain radius of known and selected potential bald eagle nest sites. Under the Forest Plan this prescription was intended to meet the requirements of the Endangered Species Act of 1973 and requires preparation of a site-specific management Plan within three years of Forest Plan approval.

- 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 FWS.
- Timber: The following direction applies within a five-chain radius of active or alternate nest sites: No programmed harvest; no salvage. No silviculture-related activities January 1 through August 31.
- The following direction applies between five and ten chains from the nest:
  Three or more overmature trees shall be left. No more than 10 percent of the area may be impacted per decade. Use of toxic chemicals is prohibited. No salvage permitted. All activities prohibited January 1 through August 31. Commercial and personal-use firewood cutting shall be an incidental secondary product of timber harvest. Firewood cutting and gathering for on-site use is permitted.
- Facilities: No corridors, roads or trails will be constructed within 400 feet of nest trees. Within 650 feet, no construction or reconstruction between February 15 and August 15. New utility and transportation corridors will be discouraged. Where no reasonable alternatives exist, corridors will be located to impose the least impact. Existing facilities are allowed.
- Protection: No use of chemicals to control insect and disease problems within the 1.5-mile radius except under recommendation from FWS.

Management Areas 10 and 11 Direction. Not applicable.

Species Status in the Pipeline Project Area. This species is associated with larger bodies of water in the Umpqua, and the only known nest sites are in the Diamond Lake Ranger District. The Umpqua National Forest Plan monitoring plan calls for annual monitoring of all known bald eagles in the Umpqua National Forest to determine site occupancy and productivity on an annual basis. At the time of the issuance of the Umpqua National Forest Plan (Forest Service, 1990b), there were two nest sites (one at Diamond Lake and one at Lemolo Lake), and in 2011 there were four known nesting pairs in the Umpqua National Forest that have fledged 60 eagles since 1990. The trend for bald eagle reproduction has been increasing over the 21 years since the Umpqua National Forest Plan was signed. No bald eagles nest within the vicinity of the Proposed Action in the Umpqua National Forest.

The National Audubon Society (2017) has conducted Christmas Bird Counts (CBC) annually within the Medford Count Circle through 2016. The Medford Count Circle is 13.7 miles from the Pipeline and 23 miles from where the Pipeline crosses the Umpqua National Forest. Bald eagles have been observed each year within the Medford CBC and are reported as numbers counted per observational hour. Since 1992, the number of bald eagles counted per hour has significantly increased ($p<0.10$), shown in Figure 2-3 (National Audubon Society, 2017). A similar increase in wintering bald eagles is expected in the Umpqua National Forest.

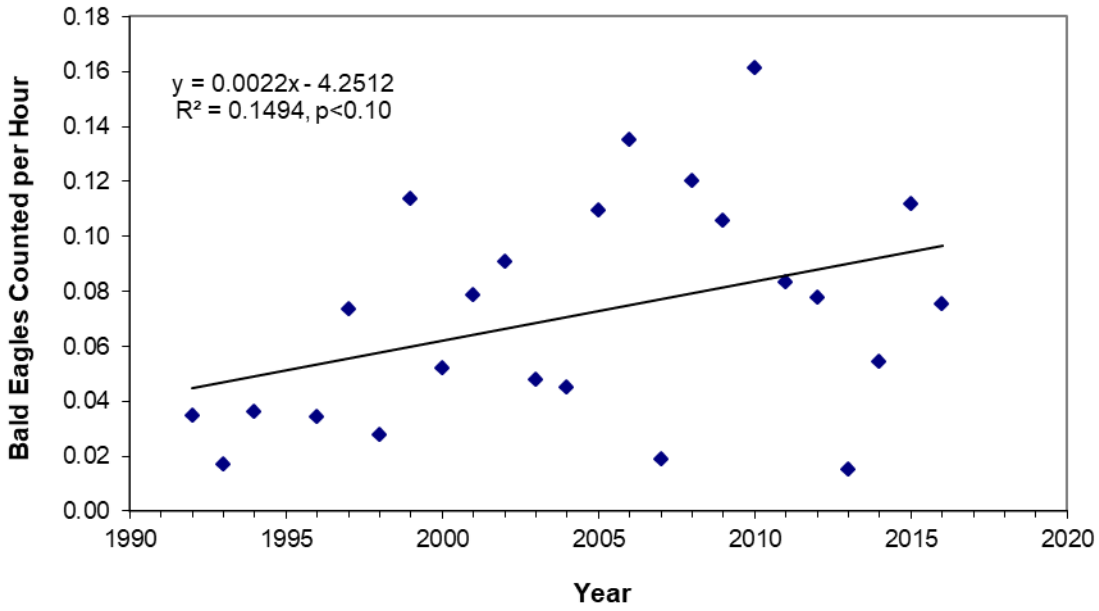

Figure 2-3
Bald Eagles Counted per Hour during National Audubon Society's Christmas Bird Count in the Medford Count Circle, 1992 to 2016 (data from National Audubon Society, 2017)

Habitat. Habitat requirements for this species are considered to be suitable nest sites and large lakes and rivers which serve as a food source. Suitable nest sites are generally within view of their feeding grounds near water (Forest Service, 1990c). Bald eagles are common in the vicinity of freshwater lakes and rivers and saltwater (Smith et al., 1997). Nests are built on large, prominent trees and snags, usually within a mile of water, and are almost always reused (Isaacs and Anthony, 2004). Bald eagle nesting, feeding, and wintering areas are known or potentially occur on or near the Proposed Action.

Bald eagles are associated with most habitat types that occur within the Umpqua National Forest in proximity to waterbodies, including Westside Riparian-Wetlands and Southwest Oregon Mixed Conifer-Hardwood Forest.

In the Pacific Northwest, bald eagles may begin nest repairs in December but courtship and pair bonding generally occur during January and February (Stinson et al., 2001). Adults begin incubating eggs by mid to late March, and this lasts for 35 days or so and young hatch near the end of April (Stinson et al., 2001). Juveniles typically fledge during July, 11 to 13 weeks after hatching (Stinson et al., 2001) but may remain in the nest vicinity for a month, usually through August (Isaacs et al., 1983). Immediately before and during egg laying and early incubation are considered the most critical, during which even temporary abandonment by adults can leave eggs or young susceptible to chilling and inclement weather, excessive solar heating, and predation (Romin and Muck, 1999).

Forest Management Activities. Habitat destruction through logging, road construction, and recreational development has in the past had the most affect to this species throughout its range.

Recent public awareness and concerns have reduced this kind of detriment, at least on public lands.

Unintentional harassment or malicious destruction of nests and shooting eagles does occur, although it has not been a problem on this Forest. Public awareness has benefited this species.

The current management for this species requires, as a minimum, preparing a site-specific management plan for each bald eagle site. Plans will be coordinated and reviewed with the FWS (Forest Service, 1990c).

Effects of the Proposed Action. Bald eagles are sensitive to human disturbances during nesting periods (Fraser et al., 1985; Johnson, 1990; Grubb et al., 1992) and at other times of the year (Stalmaster and Newman, 1978; Knight and Knight, 1984; McGarigal et al., 1991). Stinson et al. (2001) reviewed bald eagle responses to various human activities at different times in the annual cycle (nesting, roosting, foraging) and summarized various distances at which bald eagles might be expected to be adversely affected (displacement, nest abandonment) by such actions as residential developments, logging, road building, boating, recreational use, and presence of pedestrian traffic at several locales across North America. While noting that there was a high degree of variability in bald eagle response, Stinson et al. (2001) recommended spatial buffers of 1,640 feet (0.31 mile) to reduce bald eagle avoidance of shorelines with pedestrian or boat traffic and 1,690 feet (0.32 mile), a threshold within which breeding bald eagles exhibit alert responses. No bald eagles nest in the Umpqua National Forest within the vicinity of the Proposed Action (within 1 mile or closer); therefore, no effects to nesting bald eagles are expected.

Mitigation. Because of the lack of nests within the Pipeline project area on Umpqua National Forest, no mitigation specifically targeting potential impacts to bald eagles is proposed within Umpqua National Forest.

Forest Plan Consistency. Since Bald Eagles are no longer listed under the ESA, Forest Plan Prescription C3-II, Bald Eagle, intended to meet the requirements of the Endangered Species Act of 1973, is no longer applicable. The Proposed Action will not be inconsistent with the Forest Plan related to management of Bald Eagles. As reported above, bald eagle reproduction in the Umpqua National Forest has been trending slightly positive over the past 21 years, therefore Bald Eagle populations in the Umpqua National Forest are being maintained at viable levels.

2.9 Water Quality Indicator Species

Steelhead have been selected as indicator species because they occupy a variety of habitat across the Umpqua National Forest. Streams in the forest are classified based on the present and foreseeable uses made of the water, and the potential effects of on-site changes on downstream uses. Class I streams are direct sources of water used as a public water supply (more than 10 percent of the public water supply's watershed) or provide habitat usable by anadromous salmonids. Class II streams provide habitat usable by resident salmonids. Class III streams are perennial streams which are not Class I or II. Class IV streams are intermittent or seasonal streams which are not Class I or II. These stream classes are referenced extensively in the fish habitat management prescriptions detailed below.

The following Standards and Guidelines and Management Prescriptions were identified in the Forest Plan to conserve and manage for Water Quality Indicator Species and their habitat:

Applicable Forest Plan Forest-wide Standards and Guidelines. Fisheries standards and guidelines in the Forest Plan, and listed below, are not specific to Forest fish indicator species but are primarily designed for the goal of maintaining, enhancing, and protecting habitat for populations of resident and anadromous fish both in and outside the Forest.

- Maintain all effective shading vegetation on perennial streams. Utilize silvicultural practices to establish shade on perennial streams where they are currently lacking.
- Maintain or improve soil stability adjacent to all streams. When slope stability risks are high or very high, use stability buffer specifications found in Forest Plan Soil Productivity standards and guidelines.
- 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.
- Protect riparian areas from prescribed fire and equipment when treating slash in adjacent harvest unit, where practical.
- Fall timber directionally away from riparian areas to protect full width of residual vegetation, where practical.
- Do not apply pesticides within the riparian areas.
- Keep total fine sediment (<1.0 millimeter) to less than 20 percent by weight in spawning gravels.
- Design new stream crossings to provide for unimpeded fish passage and correct existing passage problems on a prioritized schedule.
- Locate new roads outside riparian areas, preferably on ridgetops, except where a stream crossing is necessary. Road reconstruction should not further degrade riparian areas.

Management Prescriptions. Similar to the Forest-wide Standards and Guidelines, management prescriptions for fish are not always specific to the forest indicator species for fish, but provide for maintaining and improving fish habitat in general. There are several management prescriptions for fish and fish habitat that apply only to specific areas or stream sections in the Forest. In some cases, these areas are not crossed by the Pipeline and so the management prescriptions are not included here.

Riparian objectives are to maintain or improve effective shade, existing sediment delivery, existing woody material for fish habitat, aquatic food source, and free salmonid fish passage. Temperature increases on Class I and II streams and lakes and ponds will be limited to the quantitative criteria in Oregon State basin standards (OAR Chapter 340). Existing stream temperatures exceed those limits in the Umpqua and Willamette basin standards, so temperature will not be increased.

Prescription C2-I, Riparian Area Class I and II Streams, Lakes, and Ponds, applies to streams and adjacent riparian areas that provide habitat for either anadromous or resident salmonids, and wildlife. It includes lakes and ponds greater than one acre, along with their riparian areas, and streams which supply water to public water systems. The riparian unit extends from 50 to 250 feet (average 100 feet), measured horizontally from each streambank at the bankfull flow mark. The prescription concentrates on maintaining existing wildlife and fish habitat, as well as existing water quality and quantity. Environmental alteration is permitted in order to meet riparian objectives. Minor changes caused by other resource activities must be mitigated to meet water quality, fish, and wildlife needs.

Prescription C2-II, Riparian Area Class III Stream, applies to perennial streams, lakes, ponds and adjacent riparian areas which do not provide salmonid fish habitat. The riparian unit extends 30 to 150 feet (average 50 feet) from each streambank at bankfull flow mark. The prescription concentrates on maintaining existing water quality and quantity. Moderate environmental alteration consistent with riparian objectives is permitted.

Riparian objectives are to provide large woody material and maintain or improve effective shade, existing sediment delivery, and aquatic food sources on Class III streams unless a site-specific assessment shows that shade removal will not result in temperature increases or degradation of aquatic habitat on downstream Class I or II waters.

Prescription C2-III, Riparian Area Class IV Stream, applies to streams with defined streambanks and seasonal surface streamflow, usually described as first- and often second-order channels. The riparian unit extends 30 to 150 feet (average 50 feet), measured horizontally from each streambank at bankfull flow mark. This prescription maintains existing water quality and quantity by maintaining existing channel, bank, and sideslope stability. Extensive environmental alteration consistent with riparian objectives is permitted.

Riparian objectives are to minimize sediment delivery to Class IV streams, and to maintain the existing channel profile with a vegetation rootmat in the streambank and stable woody material in the channel.

Prescription C2-IV, Fish Habitat Class I and II Streams, Lakes, and Ponds, applies to streams and adjacent riparian areas that provide habitat for either anadromous or resident salmonids, and lakes and ponds greater than one acre and their adjacent riparian area. The riparian unit extends from 100 to 200 feet (150-foot average), measured horizontally from the streambank at bankfull flow mark. This prescription protects and maintains the quality of anadromous and resident salmonid fish and wildlife habitat via structural and nonstructural means, as well as aquatic organism food sources and water quality and quantity. Environmental alteration is permitted in order to meet riparian objectives. Minor changes caused by other resource activities must be mitigated to meet water quality, fish, and wildlife needs.

Riparian objectives are to maintain or improve effective shade and existing sediment delivery on Class I and II streams, lakes, and ponds, and to maintain existing and future woody material, aquatic food sources and free fish passage. Temperature increases on Class I and II streams and lakes and ponds will be limited to the quantitative criteria in Oregon State basin standards (OAR Chapter 340). Existing stream temperatures are above those limits in the Umpqua and Willamette basin standards, so temperatures will not be increased.

Prescription C2-V, Fish Habitat Class III Streams applies to perennial streams, lakes, ponds, and adjacent riparian areas which do not provide salmonid fish habitat. The riparian area extends 30-150 feet (average 50 feet), measured horizontally from each streambank at the bankfull flow mark. The prescription protects and maintains aquatic food sources, water quality and quantity, and wildlife habitat. Moderate environmental alteration is permitted consistent with riparian objectives.

Riparian objectives are to provide large woody material, and maintain or improve effective shade, existing sediment delivery and aquatic food sources on Class III streams unless a site-specific assessment shows that shade removal will not result in temperature increases or degradation of aquatic habitat on downstream Class I or II waters.

Prescription C2-VI, Fish Habitat Class IV Streams applies to streams with defined streambanks and seasonal surface streamflow, usually described as first- and often second-order streams. The riparian unit extends 30 to 150 feet (average 50 feet), measured horizontally from each streambank at bankfull flow mark. This prescription protects and maintains wildlife habitat and downstream fish habitat as well as water quality and quantity by protecting groundcover vegetation in the riparian area. Moderate environmental alteration consistent with riparian objectives is permitted. Riparian objectives are to minimize sediment delivery to Class IV streams, and to maintain the existing channel profile with a vegetation root mat in the streambanks and stable woody material in the channel.

Management Areas. The Pipeline will cross portions of Forest Plan Management Areas 10 and 11. These MAs also contain river and stream drainages that are represented as resource scheduling areas (RSA) in the Forest Plan. The South Umpqua River in the vicinity of the Proposed Action is divided into five RSAs: Cow Creek, Elk Creek, Jackson Creek, the Upper South Umpqua, and the Lower South Umpqua. The Pipeline courses along the boundary shared by the Cow Creek (02) and Elk Creek (04) RSAs and intersects both of them. The RSAs in MAs 10 and 11 are assigned management prescriptions (described above) relative to fish habitat and presence.

Management Area 10 Direction. Riparian and fish habitat prescriptions are assigned for Class I, II, III and IV streams in this MA in order to meet management requirements or protect habitat for anadromous fish. In areas without anadromous fish (Resource Scheduling Areas (RSA): 2, 11-16 and 20-22), prescriptions are assigned as follows: prescription C2-I to Class I and II streams and lakes and ponds, prescription C2-ll to Class III streams, and C2-lll to Class IV streams. In RSAs 4 through 10, fish habitat prescriptions are assigned as follows: prescription C2-IV to Class I and II streams and lakes and ponds, prescription C2-V to Class III streams, and prescription C2-VI to Class IV streams.

Prescription C2-Vlll is assigned on Class I streams with demonstrated unique anadromous fish populations. Prescription C2-Vll is assigned on all anadromous fish pools signed by the Oregon Department of Fish and Wildlife. These two prescriptions do not apply to areas crossed by the Pipeline.

Management Area 11 Direction. Riparian and fish habitat prescriptions are assigned to each RSA in order to meet management requirements or protect habitat for anadromous fish. These prescriptions are assigned to inventoried Class I and II streams. Class III and IV streams that are regularly inventoried as a part of watershed management are also assigned special riparian prescriptions. In all RSAs without anadromous fish (RSAs: 02, 11-15, 20-22), MR riparian prescriptions are assigned as follows: prescription C2-I to Class I and II streams and lakes and ponds; prescription C2-ll to Class III streams, and C2-lll to Class IV streams. In RSAs 04 through 10, fish habitat prescriptions are assigned as follows: prescription C2-IV to Class I and II streams and lakes and ponds; prescription C2-V to Class III streams, and prescription C2-VI to Class IV streams. In RSAs 17 and 18 within the boundaries of MA 11, special fish habitat prescriptions are assigned as follows: prescription C2-IV to Class I and II streams and lakes and ponds, prescription C2-IV to Class III streams, and prescription C2-VI to the remaining Class IV streams. These prescriptions identify the maximum amount of vegetative disturbance permissible in a riparian area, other assigned prescriptions may indicate less disturbance.

Prescription C2-Vlll is assigned on Class I streams with demonstrated unique anadromous fish populations. Prescription C2-Vll is assigned on all anadromous fish pools signed by the Oregon

Department of Fish and Wildlife. These two prescriptions do not apply to areas crossed by the Pipeline.

Species Status in the Pipeline Project Area. Winter steelhead may be located in tributaries of the South Umpqua River, including the Upper Cow Creek watershed where the Pipeline crosses the Forest. Winter steelhead is the largest run of steelhead in the Forest and populations in the ODFW South Umpqua Species Management Unit (SMU) are not considered to be at risk (ODFW, 2005). Summer steelhead are not known to be present in the Pipeline project area within the Forest (ODFW, 2009 and Forest Service, 1990c).

In Tributaries to the Umpqua River, winter steelhead migrate upstream and spawn from January through May; egg incubation and fry emergence last from January through June; and downstream juvenile migration begins in February and ends in mid-July (ODFW, 2003c). In tributaries to the Rogue River between Marial and Lost Creek, winter steelhead may migrate upstream from September through mid-May, but spawning is from mid-February through mid-May; egg incubation and fry emergence is from mid-February through June; and downstream juvenile migration is from mid-February through June. Juvenile rearing in both drainages is likely to be throughout the year (ODFW, 2003c).

Winter steelhead are not likely to occur in the stream reaches crossed by the Proposed Action within the Umpqua National Forest. The Pipeline will cross four perennial and six intermittent tributaries to the East Fork of Cow Creek and the East Fork of Cow Creek within the Umpqua National Forest between MP 105.41 and MP 110.96, but the ODFW winter steelhead distribution in those waterbodies does not extend to the reaches crossed by the Pipeline (ODFW, 2016). The Pipeline will be within the riparian zone of another perennial stream, East Fork Cow Creek (MP 109.69) and an intermittent Tributary to West Fork Trail Creek (MP 110.57) but will not cross the waterbody within the Umpqua National Forest. Winter steelhead do occur within the West Fork Trail Creek but not in the tributary adjacent to MP 110.57r MP 110.76 (ODFW, 2016).

Habitat. Within the Umpqua National Forest, the Pipeline crosses four perennial streams (three of them assumed to be fish-bearing, the other is unknown) and six intermittent streams (fish presence is unknown) within the South Umpqua–Upper Cow Creek Fifth Field Watershed. The Pipeline also will pass through the riparian zone of one perennial stream (fish presence assumed) in the Upper Cow Creek watershed and an intermittent stream (fish presence is unknown) that is adjacent to the Pipeline but within the Upper Rogue River–Trail Creek Fifth Field Watershed.

Riparian zones associated with East Fork of Cow Creek and the tributaries that will be crossed are forested with late successional-old growth forest and/or mid-seral forest (Table 2-10). Likewise, the riparian zone associated with the Tributary to West Fork Trail Creek is forested by mid-seral forest but a developed road and rock quarry (altered habitat) are also within the riparian zone that will be crossed by the Pipeline.

Table 2-10
Summary of Habitats Removed by the Proposed Action from Riparian Zones Extending One-Site Potential Tree Height From Stream Banks and from Riparian Reserves, Extending up to Two Site-Potential Tree Heights from Stream Banks in the Umpqua National Forest

Fifth Field Watershed (Hydrologic Unit Code) and Riparian Zone	Forested Habitat [1]					Other Habitat [1]						Total Riparian Zone Impact(acres)
	Late Successional-Old Growth	Mid-Seral Forest	Regenerating Forest	Clearcut Forest	Forest Total	Forested Wetland	Non-Forested Wetland	Unaltered Non-Forested Habitat	Agriculture	Altered Habitat	Other Total	
Upper Cow Creek (HU 1710030206)												
One Site Potential Tree Height (187 feet)	2.03	2.90	2.00	0	6.93	0	0.16	0	0	0.62	**0.78**	**7.70**
Riparian Reserve	2.70	2.90	3.92	0	**9.52**	0	0.16	0	0	0.76	**0.92**	**10.45**
Trail Creek (HUC 1710030706)												
One Site Potential Tree Height (159 feet)	0	1.47	0	0	**1.47**	0	0	0	0	2.45	**2.45**	**3.92**
Riparian Reserve	0	1.47	0	0	**1.47**	0	0	0	0	2.45	**2.45**	**3.92**
Both Watersheds Total												
One Site Potential Tree Height	2.03	4.37	2.00	0	**8.4**	0	0.16	0	0	3.07	**3.23**	**11.62**
Riparian Reserve	2.70	4.37	3.92	0	**10.99**	0	0.16	0	0	3.21	**3.37**	**14.37**

Effects of the Proposed Action. Construction of the Proposed Action will remove a total of 8.40 acres of forested vegetation within one site-potential tree height of all riparian zones crossed in the Umpqua National Forest and at total of 10.99 acres of forested vegetation within Riparian Reserves crossed (Table 2-10). Effects to salmonids (Oregon Coast coho and Southern Oregon/Northern California Coast coho), to instream habitats, and to riparian zones during construction and operation were analyzed and discussed in detail in the Biological Assessment. Those same potential effects are relevant to steelhead and are summarized below:

- Removal of trees will decrease shade and cause an increase in stream water temperatures that are expected to be immeasurable.
- Construction during summer and early fall is likely to affect invertebrates that are prey to juvenile coho but will also coincide with periods of lowest fish use and lowest instream flow rates. Effects to prey are expected to be temporary and localized.
- Some herbicides may have toxic effects on aquatic organisms and may bioaccumulate while others do neither. Herbicides will not be used within 100 feet of a waterbody's mean high water mark.
- The contribution by the Proposed Action to cumulative effects by harvested timber within riparian zones on non-federal lands within the Action Area is expected to be a very small portion of overall cumulative effects within the reasonably foreseeable future.
- Total Suspended Solid (TSS) concentrations of 12 mg/L or more has the potential to adversely effect juvenile coho and steelhead (Bash et al, 2001; Berg and Northcote, 1985).
- Construction across one stream with bedrock in Umpqua National Forest may require blasting that could cause mortality to fish, eggs, and larvae by rupturing swim bladders

and addling egg sacs, if present. Adult and juvenile coho will be removed and/or prevented from being within 50 feet of blasting sites to the maximum extent possible.
- Fish salvage will occur within isolated construction sites, possibly when adult and juvenile coho are present.
- Lack of LWD is a limiting factor in most streams. Removal of Mid-Seral riparian forest (40-80 years old) will have long-term effects to recruitment of LWD and removal of Late Successional or Old Growth forest (≥80 years old) will have permanent effects to recruitment of LWD because planted conifers will not attain those age classes within the 50-year life of the Pipeline.

Mitigation. Conservation measures to address potential effects to salmonids within streams crossed by the Pipeline have been provided in the Biological Assessment for the Proposed Action. Those measures are summarized below:

- Construction across and proximate to all perennial and intermittent streams within the Riverine analysis area will be during the dates recommended by ODFW to conduct in-water construction. Construction will not coincide with steelhead upstream migration, spawning, egg incubation or fry emergence although juvenile steelhead may be present during construction.
- All waterbodies supporting fisheries will be backfilled with material (gravel, cobble or other rock substrates) removed from the trench with the upper 1-foot of the trench backfilled with clean gravel which will provide substrate for benthos and potential spawning sites for coho.
- PCGP proposes to place 16 pieces of LWD within the Upper Cow Creek watershed at streams crossed or adjacent to the centerline to address loss of riparian forests during construction within the Umpqua National Forest.
- Riparian forests will be replanted to within 15 feet of the centerline which will mature during the 50-year life of the Pipeline to provide shade and LWD to many waterbodies.

In addition to these measures, PCGP had agreed to fund other projects proposed by the Forest Service in the Umpqua National Forest that would provide benefits water quality indicator species within the Umpqua National Forest. The Forest Service will be reviewing these projects to verify their relevance to the current proposed Pipeline and implementation of these previously proposed projects or similar will be included in the CMP. Projects previously agreed to included funding for the decommissioning of 53-57.5 miles of roads and repair stream crossings at 32 locations which will provide benefits to steelhead and aquatic habitats in the Umpqua National Forest. Additionally, PCGP proposed to fund commercial and pre-commercial thinning on up to 1,240 acres that would also include fuel treatments to reduce risk of stand-replacing fire events. Downed wood and snag creation within 1,132 acres would also be funded and may occur within riparian zones and eventually contribute to large woody debris.

Forest Plan Consistency. Overall the Proposed Action will be consistent with fisheries standards and guidelines in the Forest Plan, included at the beginning of this section. The habitats of resident and anadromous fish in and outside of the Forest will be maintained through placing large woody debris in streams, reducing fire risks, avoiding use of pesticides, improving stream crossings that will reduce blockage and sediment delivery.

3.0 ROGUE RIVER-SISKIYOU NATIONAL FOREST

Species. The Management Indicator Species for the Rogue River-Siskiyou National Forest are Columbian black-tailed deer, Roosevelt elk, pine marten, northern spotted owl, pileated woodpecker, and all woodpeckers (primary cavity nesters). Species are designated as MIS for the following reasons: 1) they are dependent on specialized habitat conditions; 2) they require early, mature, or old-growth forest conditions for optimum habitat; 3) traditional game species; and 4) threatened, endangered, or sensitive species (Forest Service, 1990d).

Wildlife habitat management to rehabilitate, maintain, or improve habitats will emphasize (Forest Service, 1990d) indicator species' habitats, as well as others; examples include signing or creation of wildlife trees, manipulating stand or vegetation structure to optimize habitat components desired, improving nesting and roosting sites, restricting access during key time frames, improving forage, and providing adequate distribution of water sources (Forest Service, 1990d). Black-tailed deer and Roosevelt elk habitat will be managed to provide adequate forage, hiding cover, and thermal cover conditions throughout the summer and winter range. The pine marten, pileated woodpecker, and spotted owl represent mature and old-growth forest habitat conditions.

The northern spotted owl is now listed under the Endangered Species Act and its status is covered extensively under separate cover in the Biological Assessment.

Management Strategies 26, Restricted Riparian, and 28 are the only management strategies implicated by construction of the Pipeline. Management Strategy 26 encompasses 19,512 acres (Forest Service, 1990d).

Habitats. MIS in the Rogue River-Siskiyou National Forest are associated with a variety of habitats found throughout the forest. However, the Pipeline will cross only those habitats included in Table 3-1, below. In Table 3-1, the areas (acres) of existing forested habitats (Montane Mixed Conifer Forest and Southwest Oregon Mixed Conifer-Hardwood Forest) within one or more seral stages (clearcut-regenerating forest, mid-seral forest, late successional-old growth forest) that will be removed during construction and affected during operation are provided in addition to all other affected habitat type categories. Effects have been summarized by component during construction and during operation. Generally, most long-term disturbance is due to a 30-foot wide maintenance corridor, centered on the pipeline, that is maintained in a herbaceous and/or shrub state for the life of the Pipeline. Table 3-1 is referenced in discussions for each MIS in the sections, below.

The forested habitat (Johnson and O'Neil, 2001) corresponds to vegetation categories described by the Oregon Gap Analysis Project (Oregon Gap; Kagan et al., 1999) and mapped in the project area. For Southwest Oregon Mixed Conifer-Hardwood Forest, the corresponding vegetation categories include 1) Douglas-fir-White Fir/Tanoak-Madrone Mixed Forest, and 2) Douglas-fir Dominant-Mixed Conifer Forest (Kagan et al., 1999) and were discussed above for the Umpqua National Forest.

Montane Mixed Conifer Forest habitat (Johnson and O'Neil, 2001) in Table 3-1 corresponds to the True Fir-Hemlock Montane Forest vegetation type (Kagan et al., 1999) which is described as multi-story closed canopy forests. It also has canopy co-dominance of Pacific silver fir and/or noble fir along with both western and mountain hemlock. Other tree species present may include Douglas-fir, western white pine, subalpine fir, Alaska yellow cedar, and grand fir. Shrub layer is

dense and diverse with a number of deciduous and evergreen shrubs. It is found in middle to higher elevations (Kagan et al., 1999).

Table 3-1
Summary of Construction and Operation-Related Disturbance (acres[1]) to Corresponding Wildlife Habitat Categories (Johnson and O'Neil, 2001) in the Rogue River-Siskiyou National Forest

Component	Forest –Woodland Seral Stage [2]	Forest-Woodland			Grassland-Shrubland		Developed		Open Water	Total
		Montane Mixed Conifer Forest	Southwest Oregon Mixed Conifer-Hardwood Forest	Forest-Woodland Sub-Total	Shrub-Steppe	Grasslands	Developed-Urban and Mixed Environs	Roads		
CONSTRUCTION DISTURBANCE										
Pipeline Facilities										
Construction Right-of-Way	**L-O**	9.89	62.27	72.16	1.29	1.74		9.12	0.13	157.06
	M-S	6.71	9.98	16.69						
	C-R	22.67	33.25	55.92						
	Tot	39.26	105.5	144.76						
Hydrostatic Discharge Sites [3]	**L-O**									0
	M-S									
	C-R									
	Tot									
Rock Source/ Disposal	**L-O**						4.91			4.91
	M-S									
	C-R									
	Tot									
Temporary Extra Work Areas	**L-O**	0.15	5.87	6.02	4.2	1.18	10.76	3.09		48.56
	M-S	0.17	0.31	0.48						
	C-R	11.18	11.65	22.83						
	Tot	11.5	17.83	29.33						
Uncleared Storage Areas [4]	**L-O**	3.18	32.33	35.51	0.13	0.33		2.41	0.09	69.5
	M-S	3.57	3.76	7.33						
	C-R	11.53	12.18	23.71						
	Tot	18.29	48.27	66.56						
Total Construction Disturbance	**L-O**	13.22	100.47	113.69	5.62	3.25	15.67	14.62	0.22	280.03
	M-S	10.45	14.05	24.5						
	C-R	45.38	57.08	102.46						
	Tot	69.06	171.6	240.66						
OPERATION DISTURBANCE										
Pipeline Facilities										
	L-O	3.3	19.87	23.17	0.42	0.59		2.14	0.03	49.89

Component	Forest –Woodland Seral Stage [2]	Forest-Woodland			Grassland-Shrubland		Developed		Open Water	Total
		Montane Mixed Conifer Forest	Southwest Oregon Mixed Conifer-Hardwood Forest	Forest-Woodland Sub-Total	Shrub-Steppe	Grasslands	Developed-Urban and Mixed Environs	Roads		
30-foot Maintenance Corridor	M-S	2.39	3.07	5.46						
	C-R	7.22	10.85	18.07						
	Tot	12.92	33.79	46.71						
Total Operation Disturbance	L-O	3.3	19.87	23.17	0.42	0.59		2.14	0.03	49.89
	M-S	2.39	3.07	5.46						
	C-R	7.22	10.85	18.07						
	Tot	12.92	33.79	46.71						

[1] Acres disturbed were evaluated using GIS; footprints for each component (temporary construction right-of-way, temporary extra work areas, temporary access roads, uncleared storage areas, pipe storage yards, aboveground facilities, permanent easement, and 30-foot maintenance corridor) were overlaid on the digitized vegetation coverage.

[2] Forest-Woodland Seral Stages are L-O, Late Succession/Old Growth assumed to be ≥80 years old; M-S, Mid-Seral assumed to be ≥40 but ≤80 years old; C-R, Clearcut-Regenerating Forest assumed to be ≤40 years old.

[3] Small brush or trees may be cleared by a rubber-tired rotary or flail motor (brush hog) or by hand with machetes/chainsaws. No soil disturbance will occur. A rubber-tired or track hoe will be utilized to lay the discharge line and to remove the saturated haybales or filter bags upon completion of hydrostatic discharge.

[4] PCGP uncleared storage areas (UCSAs) will not be cleared of trees during construction. These areas will be used to store forest slash, stumps and dead and downed log materials that will be removed and scattered across the right-of-way after construction during restoration and are considered as temporary insignificant habitat modifications.

Other habitat types affected by the Proposed Action within the Rogue River-Siskiyou National Forest (Table 3-1) include:

Shrub-Steppe is a mosaic of grasses (mostly introduced) and shrubs that include big sagebrush subspecies, such as Wyoming, basin, and mountain. Other shrubs found within this cover type include low, silver, and three-tip sagebrush, and rabbitbrush. A variety of bunchgrasses are scattered with the shrubs, although overgrazing has limited their presence (Kagan et al., 1999).

Grasslands. West of Cascades, Oregon Gap aggregated this category with agriculture. This habitat contains less than 30 percent tree or shrub cover and is generally used for livestock grazing. Bunchgrasses dominate native-dominated sites, with mosses, lichens, and native forbs occurring throughout. Found at lower elevations (Johnson and O'Neil, 2001). Within the Pipeline project, this vegetation type is found within Coos, Douglas, and Jackson counties.

Other types, Developed-Urban and Mixed Environs, Roads, and Open Water, have similar characteristics to those described above for the Umpqua National Forest.

3.1 Northern Spotted Owl

The NSO was selected as a MIS for mature and old growth habitat in the 1990 Rogue River-Siskiyou National Forest Plan (Forest Service, 1990d). The NSO was proposed for listing under the Endangered Species Act (ESA) when the Rogue River-Siskiyou National Forest's Plan was signed in 1990, and was officially listed as Threatened in 1992. The Northwest Forest Plan (BLM and Forest Service, 1994) amended the Rogue River's Forest Plan (Forest Service, 1990d), and was designed to ensure the population viability of the NSO. In 1994, there were approximately

154,102 acres of suitable NSO NRF habitat that were modeled in the Rogue River-Siskiyou National Forest, and 195 inventoried NSO pairs or resident singles assumed present in the Rogue River-Siskiyou National Forest (Forest Service and BLM, 1994). In 1990, prior to extensive NSO surveys from 1990 to 1994, there was 105 known NSO pair on Rogue River-Siskiyou National Forest (Forest Service, 1990d). Since the NSO is now listed under the Endangered Species Act, it is covered extensively under separate cover in the Biological Assessment prepared for the Proposed Action. A summary of the status of NSOs and their habitat on Rogue River-Siskiyou National Forest is included here, including effects to NSO habitat from the Pipeline. Additional information can be reviewed in the Biological Assessment.

Rogue River-Siskiyou National Forest occurs within three physiographic provinces within the range of the northern spotted owl in Oregon: Klamath Mountains, West Cascades, and East Cascades. To assess the current condition of NSO habitat in the Rogue River-Siskiyou National Forest, a new dataset was used to analyze NSO habitat. In 2016, the improved 2012 Gradient Nearest Neighbor (GNN) dataset was used to assess suitable NRF habitat for spotted owls within the NWFP area (see Davis et al. 2016 and https://www.fs.fed.us/r6/reo/monitoring/data/). This model applied to the Rogue River-Siskiyou National Forest predicts that there is approximately 309,784 acres of suitable NSO NRF habitat available, which is an increase of 155,682 acres of suitable NSO habitat from what was predicted in the 1994 Northwest Forest Plan (Forest Service and BLM, 1994). Through surveys for spotted owls that have occurred in the Rogue River-Siskiyou National Forest since 1990, with the majority of recent survey efforts through demographic studies, there are more than 195 pairs of NSO or resident singles documented to have occurred or are occurring in the Rogue River-Siskiyou National Forest (Rogue River-Siskiyou National Forest, 2013 GIS data layer). This is similar to the number of NSO pairs and resident singles documented on Rogue River-Siskiyou National Forest as reported in the 1994 Northwest Forest Plan (Forest Service and BLM, 1994).

The Proposed Action affects NSO habitat (high NRF, NRF, dispersal only, and capable habitat as defined by FWS in the Conservation Framework developed for the Proposed Action; see FWS, 2014) on Rogue River-Siskiyou National Forest within the West and East Cascades physiographic provinces. All NSO habitat affected by the Proposed Action on Rogue River-Siskiyou National Forest occurs within NSO home ranges; some of the NSO home ranges analyzed on Rogue River-Siskiyou National Forest are not “known” NSO sites, but sites determined to be a “best location” from survey efforts conducted for the PIpeline. Twenty NSO home ranges with a radius of 1.2 miles (15 known, 5 PCGP best location) occur within the Pipeline project area and will have NSO habitat affected, including habitat from eight NSO core areas (6 known, 2 PCGP best location) and two known nest patches. Table 3-2, below identifies the amount of NSO habitat removed by the Pipeline in Rogue River-Siskiyou National Forest. Overall, the Pipeline would remove approximately 78.18 acres of NRF habitat (high NRF and NRF, combined), which is approximately 0.03 percent of the 309,784 acres of NRF habitat available within Rogue River-Siskiyou National Forest.

Table 3-2
Summary of NSO Habitat Removed (acres)
within Rogue River-Siskiyou National Forest

NSO Habitat	Construction Right-of-Way	Temporary Extra Work Space	Total Habitat Removed
High NRF	28.55	2.03	30.58
NRF	43.61	3.99	47.60
Dispersal Only	16.69	0.48	17.17
Capable	55.92	22.83	78.75
Total NSO Habitat	**144.77**	**29.34**	**174.10**

3.2 Columbian Black-tailed Deer

The black tailed deer is listed as an indicator species because of its economic importance in Region 6 (Forest Service, 1990d). The entire Rogue River-Siskiyou National Forest is summer and/or winter range (Forest Service, 1990d) for Columbian black-tailed deer. Summer and winter range habitat are both important to the black-tailed deer since their survival depends on the condition and presence of winter range, and on early successional vegetation stages or non-forest habitat for forage in summer range (Forest Service, 1990d). Deer summer range capability indices are useful indicators for species needing non-forested habitat for survival (Forest Service, 1990d).

The following Standards and Guidelines and Management Prescriptions were identified in the Forest Plan to conserve and manage for Columbian black-tailed deer and their habitat:

Applicable Forest Plan Forest-wide Standards and Guidelines.

- Manage habitat to provide adequate forage, hiding cover, and thermal cover conditions throughout summer and winter range.
- Habitat capability levels are to be consistent with those needed to meet and sustain state big game population benchmark levels, which are the number of deer that must be produced on an ODFW Management Unit before restrictions or regulations designed to limit excessive harvest can begin to be relaxed (Forest Service, 1990d). Benchmarks must be reached prior to initiation of antlerless hunts. (Forest Service, 1990d)
- The Forest Plan allocates 67,700 acres to winter range management. Since 1990, the Forest Plan anticipated that deer winter range carrying capacity would improve as management objectives for deer winter range needs were implemented; these improvements were expected to result in a capability to support up to 16,700 deer, which is 10 percent above the ODFW benchmark level of 15,200 deer (Forest Service, 1990d) on the Forest. Big game winter range timing limitations are December 1-April 30. Construction constraints deem that there shall be no disturbance within designated habitat during that period (App. 3D, 54).

Management Prescriptions. Management Strategy (MS) 26, Restricted Riparian, and MS 28, Late Successional Reserves.

Management Strategy 26 goals are to protect the riparian habitats associated with perennial streams for wildlife, fishery, and other beneficial uses, and to protect perennial streams from harmful water temperature variations, blockages, and sediment deposits.

- Deer: Maintain summer range to provide forage, hiding, and thermal cover. Restricted operating period Apr 1-June 30 may be imposed in identified fawning or calving areas.

- Recreation-Road Natural: Manage for Retention Visual Quality Objective, by blending and shaping regeneration openings with natural terrain, and assessing visual resource impacts in all project analyses.
- Wildlife, Fish, and Plants: Maintain existing fish habitat capability. If sensitive species are found, avoidance or other mitigation shall be used for species whose viability has been identified as a concern. Specific practices are outlined for the following species: Northern Spotted Owl, osprey, goshawk, woodpeckers, elk, bald eagle, and peregrine falcon.
- Timber: Harvest is not programmed and normally would not occur.
- Water: Evaluate effects on stream courses.

Species Status in the Pipeline Project Area. Black-tailed deer are found throughout the entire Rogue River-Siskiyou National Forest. ODFW conducts surveys for black-tailed deer within portions of three Oregon Wildlife Management Units (WMU) that occur within the Rogue River-Siskiyou National Forest: Applegate, Dixon, and Rogue. Based on ODFW estimations of total deer population within three ODFW WMUs (Dixon, Applegate, and Rogue), the population of black-tailed deer was estimated at 12,000 animals in Rogue River National Forest at the time of the Rogue River National Forest Plan in 1990. The 1990 Forest Plan estimated that the black-tailed deer population was expected to increase by 15 percent per decade for the first two decades, then return to then-current growth levels and stabilize by the end of the sixth decade (Forest Service, 1990d). Trend data from ODFW indicate that the population had declined by approximately 24 percent since peak years in the early 1960s (Forest Service, 1990d). With the exception of fluctuations generated by extreme weather conditions, the 1990 deer population was described as healthy, and its numbers adequate to provide success to one out of every 4 to 5 hunters (Forest Service, 1990d).

ODFW's Rogue WMU 30 coincides with the portion of the Rogue River National Forest within which the Proposed Action is located (MPs 153.81-148.33). ODFW (2018a) has compiled harvest data on black-tailed deer within Wildlife Management Unit 30 through the 2016 (ODFW, 2018a). From 2003 through 2016, percent hunter success has been relatively consistent. Hunter effort per animal harvest from 2004 through 2014 increased slightly, but no significant trends are apparent (Table 3-3).

Thermal cover had become limiting on many areas of the forest by 1990 and for the next 20 to 30 years it was expected that forage could become limiting. As a result, the deer population was expected to remain constant for a time then drop somewhat from 2010-2030. Since deer are not as sensitive to these habitat factors as elk, actual population variations were thought to be less drastic than indicated by the habitat conditions. In 1990, the National Forest Service believed that increased demand for deer hunting might not be met in the future (Forest Service, 1990d); however, that possibility does not appear supported by harvest data in Table 3-3.

Table 3-3
Harvest Statistics for Black-Tailed Deer within the Rogue Wildlife Management Unit 30, 2003-2016

Year	Total Hunters	Total Hunter Days	Harvest			Days per Harvest	Percent Hunter Success
			Total Males (antlered)	Total Non-Males (non-antlered)	Total		
2016	9,983	not reported	1,825	28	1,853	not available	19
2015	10,079	not reported	1,851	30	1,881	not available	19
2014	10,394	72,787	1,915	13	1,928	38	19
2013	10,652	73,652	1,878	21	1,899	39	18
2012	10,537	75,374	1,858	45	1,903	40	18
2011	9128	61503	1524	15	1539	40	17
2010	9478	63782	1303	38	1341	48	14
2009	9703	63092	1631	28	1659	38	17
2008	10608	70626	2116	30	2146	33	20
2007	10326	64071	2002	31	2033	32	20
2006	9158	56285	1574	12	1586	35	17
2005	7279	44293	1326	33	1359	33	19
2004	8682	56245	1794	18	1812	31	21
2003	9478	64424	1307	134	1441	45	15

Annual reports for each WMU provided by ODFW include 1) a population index - ODFW's Trend Count for animals in the WMU, conducted along a fixed route each year, usually at the end of winter, 2) productivity (young per female from ODFW's Composition Count data reported in December), and 3) an estimate of the maximum overwinter juvenile survival rate (derived from composition count data in December and composition count data the following March). There is no significant trend ($p>0.10$) in fawns per doe (young per adult female) through 2012; however, there is a significant increasing trend in ODFW's Population Index from 1998 through 2012 in Table 3-4 ($P<0.01$). Estimated young overwinter survival relative to adult overwinter survival indicates that juvenile black-tailed deer in the Rogue Wildlife Management Unit 30 have had high overwinter survival rates relative to adult deer - estimates near or greater than 1 - since 1998 (Table 3-4). ODFW has not provided any similar, additional data for black-tailed deer since 2012 and more recent trends in population growth, productivity, and overwinter survival are unknown.

Table 3-4
Population Trends, Annual Productivity, and Estimated Overwinter Survival for Juvenile Black-tailed Deer within the Rogue Wildlife Management Unit 30, 1998-2012

Year	Population Index [1]	Young per Adult Female [2]	Young per Adult – Fall (Ratio A) [3]	Young per Adult – Spring (Ratio B) [4]	Maximum Overwinter Juvenile Survival Rate [5]
2012	10.0	0.51	0.38	0.42	1.11
2011	10.7	0.45	0.38	0.51	1.75
2010	10.4	0.39	0.29	0.50	1.93
2009	12.1	0.36	0.26	0.55	2.11
2008	10.2	0.38	0.26	0.49	1.31
2007	10.6	0.53	0.37	0.55	1.43
2006	8.1	0.43	0.38	0.61	1.22
2005	5.5	0.69	0.50	0.63	1.82

Year	Population Index [1]	Young per Adult Female [2]	Young per Adult – Fall (Ratio A) [3]	Young per Adult – Spring (Ratio B) [4]	Maximum Overwinter Juvenile Survival Rate [5]
2004	-	0.44	0.35	0.45	1.97
2003	6.5	0.29	0.23	0.38	1.10
2002	0.0	0.41	0.34	0.43	1.24
2001	6.0	0.45	0.35	0.57	1.66
2000	7.3	0.43	0.34	0.40	0.88
1999	7.1	0.53	0.45	0.57	1.63
1998	6.7	0.42	0.35	0.42	-

[1] **Population Index** is ODFW's Trend Count for the Hunt Area which is conducted along a fixed route each year, usually at the end of winter (ODFW, 2018b).

[2] **Productivity** data is young per female from ODFW's Composition Count data reported as Young per 100 Females counted in December (ODFW, 2018b).

[3] **Ratio A** (White et al., 1996) is the ratio of Young per Adult, derived from Composition Count data (Males per 100 Females and Young per 100 Females) counted in December (ODFW2018b).

[4] **Ratio B** (White et al., 1996) is the ratio of Young per Adult (Young per 100 Adults) counted in March (ODFW, 2018b).

[5] **Maximum Overwinter Juvenile Survival** is related to ratios ***A*** and ***B*** and to the following relationship of adult over-winter survival rate ($\hat{S}_a$) and juvenile over-winter survival rate ($\hat{S}_j$) by the formula (see equation 9 in Paulik and Robson, 1969): $\hat{S}_j / \hat{S}_a = \boldsymbol{B}/\boldsymbol{A}$ or $\hat{S}_j = \hat{S}_a$ ($\boldsymbol{B}/\boldsymbol{A}$). Since many of the estimates of maximum juvenile survival rates are greater than 1, they indicate survival of adults was less than juveniles over winter which is highly unlikely.

Habitat. Black-tailed deer are year-round residents of the Forest and rely upon several different successional stages of vegetation to meet their life needs. Areas with heavy canopy closure are used during all seasons. In summer, areas of heavy canopy closure are used to facilitate thermal regulation during periods of high temperatures. During winter, heavy canopy closure moderates temperatures and intercepts snowfall during winter storms. The reduction of snow depth under heavy canopy reduces energetic expenditure during movements of deer and provides areas of browse that would normally be under the snow surface. Areas with little or no overstory canopy cover are important for deer as forage areas. Forest gaps and natural openings provide optimal conditions for shrubs and forbs to grow, which deer depend on for forage. Quality deer ranges provide both forested conditions for thermal regulation and hiding/escape cover interspersed with open areas for optimal foraging conditions.

Deer winter range was considered to be below 4,000 feet elevation in 1990 (Forest Service, 1990d). Core winter range is that portion of total winter range occupied by 90 per cent of the population 90 percent of the winters. If unusually severe snow conditions make core winter range unsuitable, the deer tend to move off-Forest to lower elevation on private and BLM lands. These areas were referred to as critical winter range.

Currently forage habitat for deer is the primary limiting factor in the Rogue River-Siskiyou National Forest, constituting less than ten percent of the Forest land base. The west side of the Forest provides good forage in designated big game winter range for black-tail deer due to a preponderance of low elevation non-conifer forest lands and an active fuels and habitat enhancement program. Deer thermal and hiding cover have increased significantly across the Forest although in some areas of big game winter range still not to that amount prescribed in the Rogue River Management Plan (Forest Service, 1990d).

Black-tailed deer use of habitats in the Rogue River-Siskiyou National Forest within the vicinity of the Proposed Action are assumed to be similar to those described above, for black-tailed deer in the Umpqua National Forest. Black-tailed deer have general associations with all terrestrial habitats that are present in the Pipeline project area including forested-woodland types, grassland-shrubland types, and developed (urban and mixed environs) types (Johnson and O'Neil, 2001). Most black-tailed deer that summer in the high Cascades winter at lower elevations on the west slope, although some wintering deer may occur east of the Cascade crest (ODFW, 2003b). Winter loss of black-tailed deer is generally far less than for mule deer, because the snow does not remain on the valley floors for extended periods and a crust does not form on the surface as it does on the east side of the Cascades (ODFW, 2003b). The Proposed Action will cross 1.44 miles of Lake Creek deer winter range in the Rogue River-Siskiyou National Forest.

Forest Management Activities. Timber harvest activities have created the most impacts on deer populations. Browse created by conversion of old-growth timber to young, thrifty stands has caused a large expansion in the number of animals. However, in many cases, the amount and arrangement of thermal/hiding cover has not allowed for full utilization of the forage. Development of the road system has also had a detrimental effect due to increased harassment and hunter access (Forest Service, 1990a).

Any pest control that removes palatable grasses, forbs, and brush directly affects the suitability of the habitat; wildfire produces the same effects. However, these activities can also be beneficial if they return the vegetation to more forage-producing seral stages (Forest Service, 1990a).

Effects of Proposed Action: Direct mortality of black-tailed deer due to the Proposed Action is possible if vehicles collide with animals traveling to and from construction sites (see discussion under Umpqua National Forest, Section 1.5, above). Black-tailed deer would be expected to avoid noise from vehicles and/or increased road traffic, blasting, and aerial fly-overs. Seasonal road closures on public lands have been applied to big-game winter range within National Forest lands to minimize the effect of winter stress on deer and elk. Following reclamation of the pipeline corridor, black-tailed deer may utilize the corridor for travel and for foraging, depending on vegetation species planted and rapidity of successful revegetation. After construction, there will possibly be a secondary impact (Comer, 1982) on harvest rates with upgraded access to previously inaccessible areas; hunters are expected to achieve greater success, at least temporarily, with increased access. In addition, increased access could increase poaching of game animals and nongame wildlife on a local level (see discussions under Umpqua National Forest, Section 1.5, above).

No information has been found that identifies specific deer fawning areas or fawning habitats within the Rogue River-Siskiyou National Forest. Construction may coincide with fawning generally in late spring (May-early June). Fawning areas may be proximate to winter ranges or may be at higher elevations than winter range. If construction is in progress, parturient females will most likely avoid construction areas though the extent (distance) of avoidance cannot be estimated. Avoidance of construction areas by big game during winter and during parturition is also expected and may adversely affect animals in one or more ways, including increased energy expense if they escape from disturbances or are displaced to areas of deeper snow accumulation, use of suboptimal habitats that do not provide adequate functions (food, shelter, escape cover), and use of habitats that increase the risk of predation. The expected consequences of these responses would be decreased over-winter survival and decreased natality potentially related to embryo resorption, abortion, and/or predation of neonates (for example, see Bradshaw et al., 1998).

Construction of the Pipeline will remove 174.10 acres of forested habitat (Table 3-1) including 78.18 acres of late successional-old growth, 17.17 acres of mid-seral forest, and 78.75 acres of clearcut-regenerating forest within Rogue River-Siskiyou National Forest. This includes approximately 17.67 acres of big game winter range in the Rogue River-Siskiyou National Forest. Black-tailed deer are likely to be generally associated with the forest types affected and all structural conditions of affected forest (shrub-seedling, small tree, medium tree, large tree, giant tree, single and multi-story forests, open, moderate, and closed canopy forests). An additional 66.56 acres of forested habitat would be affected in the short-term within Uncleared Storage Areas (UCSAs). The Pipeline will remove approximately 5.62 acres of shrub, 3.25 acres of grassland, and 15.67 acres of developed urban environs. Black-tailed deer are generally associated with a variety of shrub/grassland structural conditions, grass-forb habitats, and low density urban conditions (Johnson and O'Neil, 2001). Given that black-tailed deer are such generalists, effects to any one type of structural habitat condition with replacement by another structural stage (eg. shrub-seedling, grass-forb) will not adversely affect the species.

Mitigation. The Proposed Action will cross approximately 1.44 miles of Lake Creek deer winter range in the Rogue River-Siskiyou National Forest. Timber felling will occur before April 1 and after July 15, outside of the migratory bird primary nesting season and would occur concurrent, but prior to construction. Construction and timber removal activities are scheduled to reduce impact to migratory birds nesting in standing trees, take advantage of the drier periods of the year to minimize winter construction, to reduce potential environmental impacts and construction safety risks, and ultimately reduce disturbance to black-tailed deer utilizing big game winter range. Therefore impact to wintering Columbian black-tailed deer should be minimized during timber removal and construction activities.

After construction, deer use open areas for foraging (Jageman, 1994). The pipeline right-of-way provides an opportunity for developing high quality feeding areas (Lees, 1989) for deer species, especially if noxious weeds are controlled and high quality native forage is seeded. As required by FERC's Upland Plan, PCGP consulted with the NRCS, the BLM, and the Forest Service regarding specific seeding dates and recommended seed mixtures for the Pipeline project, including important winter forage species, such as wedgeleaf ceanothus, in riparian areas and areas outside of the 30-foot maintenance corridor on National Forest lands. The recommendations have been incorporated into the ECRP. The ECRP describes the procedures that will be implemented to minimize erosion and enhance revegetation success, the procedures that will be utilized to minimize the spread of noxious weeds as a result of construction, and describes the silvicultural prescriptions that will be implemented in areas that are outside the 30-foot maintenance corridor. Seeding mixtures and inhibition of noxious weeds will enhance forage production. Restoration of construction disturbance is expected to begin once construction is completed; restoration would start in the fall and would be completed by the end of the winter season when forest, wetland, and riparian plantings would be installed. Depending on site-specific conditions, it may be necessary to continue restoration through the spring.

Vegetation management over the long-term will benefit winter range browse and forage for Columbian black-tailed deer. Vegetation within the 30-foot maintenance corridor will be periodically maintained by mowing, cutting, and trimming (either by mechanical or hand methods). In upland areas, the 30-foot maintenance corridor will be maintained in a condition where trees or shrubs greater than 6 feet tall will be controlled (cut or trimmed) within 15 feet either side of the centerline (for a total of 30 cleared feet). Maintenance activities are expected to occur approximately every 3 to 5 years depending on the growth rate of vegetation. During maintenance, vegetation will be cut/trimmed in 4 to 6-foot lengths and scattered across the

permanent easement to naturally decompose and to discourage OHV traffic, benefit wildlife habitat, and to decompose naturally.

Approximately 241 acres of forested habitat will be affected within the Rogue River-Siskiyou National Forest. However, PCGP will revegetate 194 acres of the affected area with trees to provide a similar vegetative community to what was present prior to timber clearing. The remaining 47 acres of affected forest will be converted to an herbaceous/shrub vegetative cover for the long-term within the 30-foot maintenance corridor during Pipeline operation, increasing the amount of forage available to big game adjacent to forested stands potentially used for thermal cover.

Open trenches during construction have the potential to entrap deer. Within delineated big-game winter and summer range, PCGP will leave trench segments (>5 feet wide) of the proposed alignment untrenched and herbaceously vegetated (every 0.5 mile and at visible wildlife game trails) to serve as a route (i.e., green bridge or landscape connector) for big game across the construction right-of-way until pipe is ready to be installed (Forman et al., 2003). Alternatively, PCGP will install soft plugs (backfilled trench materials) in the trench after excavation at these distances to provide wildlife passage. Additionally, 20-foot gaps will be left in spoil and topsoil stockpiles at all hard or soft plug locations and a corresponding gap in the welded pipe string will be left in these locations. Suitable ramps will be installed from the bottom of the trench to the top to prevent potential wildlife entrapment within the trench.

Forest Plan Consistency. In the Rogue River-Siskiyou National Forest, big game winter range timing limitations are December 1 to April 30. Construction activities would occur within approximately 1.44 miles of designated big game winter range in the Rogue River-Siskiyou National Forest and could occur during those timing limitations. However, PCGP would target the drier periods of the year to construct, where possible, which would minimize disturbance to black-tailed deer within designated habitat during that period. Big game travel lanes will not be blocked by construction or operation of the Proposed Action. Columbian black-tailed deer are expected to utilize the pipeline right-of-way for travel and foraging and was discussed, above.

Since there is no significant trend in fawns per doe (young per adult female) nor is the any significant trend in ODFW's Trend Count for deer in the Rogue Wildlife Management Unit 30 through 2012 **(**Table 3-4), there is no reason to expect that deer winter range carrying capacity in the Rogue River-Siskiyou National Forest would be limited by the Proposed Action. Indeed, estimated young overwinter survival relative to adult overwinter survival indicates that juvenile black-tailed deer in the Rogue Wildlife Management Unit 30 have had high overwinter survival rates relative to adults (Table 3-4) which may indicate carrying capacity objectives of the Forest are being achieved. The Proposed Action would be consistent with the Forest Plan.

3.3 Roosevelt Elk

Roosevelt elk was selected as a management indicator species because of the species economic importance and demand for elk hunting. Elk were chosen as an indicator for winter range and thermal cover. The Roosevelt elk is dependent on winter range for survival (Forest Service, 1990d). The following Standards and Guidelines and Management Prescriptions were identified in the Forest Plan to conserve and manage for Roosevelt elk and their habitat:

Applicable Forest Plan Forest-wide Standards and Guidelines.
The management of Roosevelt elk winter range is critical for the maintenance of existing herds, and even more so in order to increase the population. Winter range generally lies below 4,000

feet, but can be quite variable. It can be divided into three separate areas based on amount and type of use, which include core, critical, and peripheral areas. Core winter range is utilized by 90 percent of the animals during 90 percent of the winters. Peripheral winter range is an area used by a few animals in most winters or by large numbers during mild winters; it does little in maintaining the big game population since either few animals use it or conditions are mild so that little stress is placed on the animals. Critical winter range is the area the animals concentrate in during extremely severe winters. It is usually a small segment of the core winter range that is located at the lowest elevations or otherwise provides a special set of properties which allow survival under extreme conditions. Critical winter range is most useful in preventing total loss of a population during extremely severe winters. Under these conditions, a large proportion of the wintering animals are either trapped on less favorable areas or are otherwise unable to move to critical winter range. Sufficient numbers are able to survive on these critical winter range areas to repopulate the summer range, should large numbers of animals die on the other winter range areas (Forest Service, 1990a).

Management Prescription. *MS 26, Restricted Riparian*

- Elk: Maintain summer range to provide forage, hiding and thermal cover. Restricted operating period April 1 to June 30 may be imposed in identified fawning or calving areas.
- See description for Black-tailed deer, Section 2.1, above.

Species Status in the Pipeline Project Area. The historic elk population in the vicinity of the Rogue River-Siskiyou National Forest was affected by the loss of cover on much of the lands beyond the forest boundaries, which resulted in the loss of much winter range capability off the Forest. This relative lack of cover appears to inhibit migration to the even lower elevation areas that might be capable of supporting the animals; therefore, elk are wintering at higher elevations than they historically may have, resulting in winter range being a limiting factor to further growth of the present elk herds. The opportunity for further recolonization of the remaining habitat on the Dead Indian Plateau as well as within the Siskiyou Mountains portion of the Forest still remains (Forest Service, 1990d).

In the early 1980s, lower cow/calf ratios and reduced calf-survival rates due to late calf crops occurred. Because of the decline, restrictions were placed on the hunting season and a cooperative road closure program was instituted. The result was an improved bull/cow ratio (11 to 12 bulls/100 cows) for the years following the changes (Forest Service, 1990d). As a result of continued herd expansion into previously unoccupied habitat, the elk population was expected to increase at about 5 percent per year, with occupancy of all available range in next 20 to 30 years, from 2010 through 2030. However, it was not expected that the increases will meet hunter demands because increased restrictions and regulations have been placed upon the hunting public to reduce the pressure on the existing herd (Forest Service, 1990d).

The Rogue River-Siskiyou National Forest falls within portions of six wildlife management units: Sixes, Powers, Chetco, Applegate, Dixon, and Rogue. Elk are found throughout the Rogue River-Siskiyou National Forest, except within the Applegate Management Area. Data from ODFW's elk census shows annual fluctuations (ODFW, 2012), but in general, show a steady increase in elk numbers throughout the 1980's. Elk numbers peaked in the early 1990's and remained relatively stable until the early 2000's when they show a slight decline.

ODFW's Rogue WMU 30 coincides with the portion of the Rogue River-Siskiyou National Forest within which the Proposed Action is located (MPs 153.81-148.33). .ODFW (2018a) has compiled harvest data for Roosevelt elk within WMU 30 through the 2016 season (ODFW, 2018a). ODFW

harvest data from 2003 through 2016 indicate that days per harvest of Roosevelt elk through 2014 and percent hunter success through 2016 had been relatively consistent, showing no significant trends (Table 3-5).

Table 3-5
Harvest Statistics for Roosevelt Elk within the Rogue Wildlife Management Unit 30, 2003-2011

Year	Total Hunters	Total Hunter Days	Harvest			Days per Harvest	Percent Hunter Success
			Total Males (antlered)	Total Non-Males (non-antlered)	Total		
2016	2869	not reported	89	41	130	not available	5
2015	3267	not reported	114	60	174	not available	5
2014	3442	19940	139	57	196	102	6
2013	3607	20459	121	15	136	150	4
2012	3736	21843	157	69	226	97	6
2011	3193	18163	134	63	197	92	6
2010	3142	18753	109	90	199	94	6
2009	3244	18299	130	97	227	81	7
2008	3974	21753	145	119	264	82	7
2007	3645	18790	144	106	250	75	7
2006	3280	17125	167	76	243	70	7
2005	3289	16703	156	50	206	81	6
2004	3651	21971	142	64	206	107	6
2003	4248	24286	198	125	323	75	8

As of 1990, the population had been increasing 5 to 8 percent per year, with an estimated existing population of 900 animals. Expansion depends on the condition and availability of winter range, both on and off the National Forest, and the quality of habitat available on summer range. A predictive model, assuming adequate core winter range and based upon seral stages and road use factors, indicates a capability to support about 1,800 elk on the Prospect and Butte Falls Districts. If elk occupied all available habitat on Rogue River-Siskiyou National Forest, a capability to support over 3,000 elk was predicted (Forest Service, 1990d).

Although population data for Roosevelt elk in Wildlife Management Unit 30 are limited, the number of calves per adult cow (young per adult female) appears to have been significantly declining since 1998 (Figure 3-1). No population indices are available beyond 2004. Productivity (calf per cow) in the Rogue WMU shows a significant ($p<0.05$) declining trend (Figure 3-1) from 1998 through 2016, consistent with a decreasing population growth rate.

Based on management of winter range under guidelines in the Forest Plan, improved winter range conditions and a better balance in winter and summer range could result in a capability to support up to 2,700 elk (higher than the ODFW benchmark level of 1,750 animals) within 5 or 6 decades past 1990 (Forest Service, 1990d). .

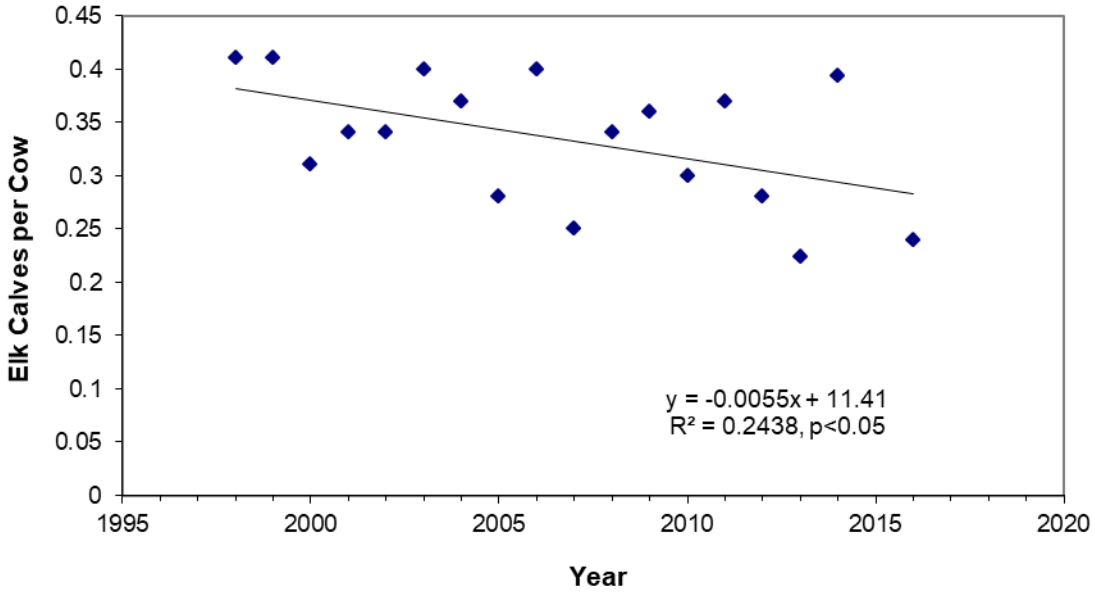

Figure 3-1
Trend in Productivity (Calves per Cow) for Roosevelt Elk in the Rogue Wildlife Management Unit 30 which Coincides with the Pipeline in the Rogue River-Siskiyou National Forest (data from ODFW, 2018b)

Habitat. The Roosevelt elk is a grazing and browsing animal (Forest Service, 1990d). It forages on ground/shrub or understory vegetation (Johnson and O'Neil, 2001). It is dependent on winter range for survival, and benefits from early successional stages for forage throughout its range (Forest Service, 1990d). Thermal cover is important (Forest Service, 1990d). During winters of heavy snowfall, elk in the Cascades move to lower elevations in November and December, and move back up in March and April for spring green-up. Altitudinal movements occur in the Cascade Range, but rarely is snow depth sufficient to cause movements in the Oregon Coast Range (Johnson and O'Neil, 2001).

Winter range is usually within forested sites which provide protection against weather, as well rich with lichens and other plants used as forage (ODFW, 2003b); however, in Jackson County, winter range also consists of other habitat types such as grassy meadows, recent clearcuts, industrial forest lands, agricultural fields, orchards, and urban edges. Most elk range is on BLM and National Forest Service lands (ODFW, 2003b); however, within the Pipeline project area, most winter range occurs on private lands (Forest Service, 1990d). There is insufficient critical elk winter range in the Rogue River-Siskiyou National Forest to carry the ODFW benchmark level of 2,000 animals during severe winters, resulting in increased dependence on private land pastures as elk winter range with resulting conflicts from loss of needed livestock forage and/or damage to property or tree seedlings (Forest Service, 1990a). Since inception of the NWFP (Forest Service and BLM, 1994), the Rogue River National Forest has emphasized retention of both nesting/roosting/foraging (NRF) and dispersal habitats for northern spotted owl. An increase in NSO NRF and dispersal habitat has also provided additional optimal thermal cover for elk.

The Forest supports about 204,800 acres of elk winter range mostly located in the Butte Falls and Prospect Ranger Districts. Of this, approximately 67,700 acres has been identified as core winter range. In good condition, core winter range can relieve some of the burden from the critical winter

range areas, since fewer animals will die even in the extreme winters. All critical winter range in the Forest is located within the core winter range (Forest Service, 1990d). The Proposed Action will cross 1.44 miles of elk winter range but not affect core winter range within the Forest.

Roosevelt elk have general associations with Montane Mixed Conifer and Southwest Oregon Mixed Conifer-Hardwood forested types, Westside Grasslands, and may be present in Urban and Mixed Environs (Johnson and O'Neil, 2001). They have no apparent association with Shrub-Steppe habitats (Johnson and O'Neil, 2001) that will be affected by the Proposed Action within the Rogue River-Siskiyou National Forest.

Forest Management Activities. Current timber harvesting has created a large amount of available forage but has also decreased available thermal and hiding cover. Total cover has remained at or above adequate levels, although the distribution is not great, with large distances between cover patches in some areas, and thermal cover shortages in other areas. This may be limiting some sub-populations to 20 percent of their potential. During warm summers, heat build-up on an exposed animal creates a heavy thermal load which takes energy to eliminate. This energy could have been stored as fat for winter (Forest Service, 1990a).

Much of the land adjacent to the forest is capable of being winter range. Due to harvest practices on these adjacent lands, much of the winter range carrying capacity has been lost. Much of the forest's summertime elk population historically wintered on these adjacent lands. As the population increases, it is expected that there will be increased conflicts with private landowners, resulting in increased pressure on the remaining forest winter range (Forest Service, 1990a).

Due to past timber harvest, an imbalance in forage and cover is likely to occur from 2010 to 2030. At that time, existing harvest areas will likely have reached the pole seral stage and will be shading out most forage production, and there will not be sufficient remaining older stands to be harvested to provide adequate replacement forage areas (Forest Service, 1990a). Forage needed to meet deer and elk needs on winter range portion of range allotments is reserved for wildlife, which could result in restrictions in grazing allotments if forage production is inadequate. In 1990, there were problems in some riparian zones and meadows, and it was felt that the conflicts would increase in subsequent years (Forest Service, 1990a).

Any pest management activities that remove grass or browse species in summer or winter range can affect the elk. Wildfire creates habitat if sufficient thermal and hiding cover remain; fire suppression has decreased elk habitat to some extent over the last 50 years since it has allowed the early seral stages to mature, thereby reducing forage supply. However, controlled fire activities after timber harvest have created favorable seral stages for expansion of the population. The most critical habitat problems for summer range are: road development, loss of forage areas, and difficulties in managing the road system to lessen impacts on elk (Forest Service, 1990a).

Numerous studies have shown that Roosevelt elk are sensitive to human disturbances such as motorized travel on and off roads (Rowland et al., 2000). Roads are generally avoided by elk when they are open, but are heavily utilized by elk as travel corridors when closed (ODFW, 2003b).

Effects of the Proposed Action. Direct mortality of Roosevelt elk due to the Proposed Action is possible if vehicles collide with animals traveling to and from construction sites (see discussion under Umpqua National Forest, Section 1.4, above). Elk would be expected to avoid noise from vehicles and/or increased road traffic, blasting, and aerial fly-overs. Seasonal road closures on public lands have been applied to big-game winter range within National Forest lands to minimize

the effect of winter stress on deer and elk. Following reclamation of the pipeline corridor, Roosevelt elk may utilize the corridor for travel and for foraging (Brusnyk and Westworth, 1985), depending on vegetation species planted and rapidity of successful revegetation. After construction, there will possibly be a secondary impact (Comer, 1982) on harvest rates with upgraded access to previously inaccessible areas; hunters are expected to achieve greater success, at least temporarily, with increased access. In addition, increased access could increase poaching of game animals and nongame wildlife on a local level (see discussions under Umpqua National Forest, Section 1.4, above).

Unlike big game winter ranges, no information has been provided that identifies specific elk calving areas or habitats. Even so, with elk habitats distributed throughout the Pipeline project, construction may coincide with calving times, generally in late spring (May to early June). Calving areas may be proximate to winter ranges or may be at higher elevations than winter range. If construction is in progress, parturient females will most likely avoid construction areas though the extent (distance) of avoidance cannot be estimated. Avoidance of construction areas by big game during winter and during parturition is also expected and may adversely affect animals in one or more ways, including increased energy expense if they escape from disturbances or are displaced to areas of deeper snow accumulation, use of suboptimal habitats that do not provide adequate functions (food, shelter, escape cover), and use of habitats that increase the risk of predation. The expected consequences of these responses would be decreased over-winter survival and decreased natality potentially related to embryo resorption, abortion, and/or predation of neonates (for example, see Bradshaw et al., 1998).

Construction will remove 174.10 acres of Montane Mixed Conifer Forest and Southwest Oregon Mixed Conifer-Hardwood Forest within Rogue River-Siskiyou National Forest (Table 3-1), both of which have general associations with Roosevelt elk. Effects to those two forest types include removing 78.18 acres of late successional-old growth, 17.17 acres of mid-seral forest, and 78.75 acres of clearcut-regenerating forest. Roosevelt elk are likely to be generally associated with the forest types affected and all structural conditions of affected forest (shrub-seedling, small tree, medium tree, large tree, giant tree, single and multi-story forest, open, moderate, and closed canopy forests). An additional 66.56 acres of forested habitat would be affected in the short-term within Uncleared Storage Areas (UCSAs). The Pipeline will remove approximately 5.62 acres of shrub, 3.25 acres of grassland, and 15.67 acres of developed urban environs. Roosevelt elk are generally associated with a variety of shrub/grassland structural conditions, grass-forb habitats, and low density urban conditions (Johnson and O'Neil, 2001). Given that Roosevelt elk are such generalists, effects to any one type of structural habitat condition with replacement by another structural stage (e.g. shrub-seedling, grass-forb) will not adversely affect the species.

Mitigation. The Proposed Action will cross approximately 1.44 miles of Lake Creek winter range in the Rogue River-Siskiyou National Forest. Timber felling will occur before April 1 and after July 15, outside of the migratory bird primary nesting season and would occur concurrent, but prior to construction. Construction and timber removal activities are scheduled to take advantage of the drier periods of the year to minimize winter construction, to reduce potential environmental impacts and construction safety risks, and ultimately reduce disturbance to Roosevelt elk utilizing big game winter range. Therefore impact to wintering Roosevelt elk should be minimized during timber removal and construction activities.

Open trenches during construction have the potential to entrap elk. Within delineated big-game winter and summer range, PCGP will leave trench segments (>5 feet wide) of the proposed alignment untrenched and herbaceously vegetated (every 0.5 mile and at visible wildlife game trails) to serve as a route (i.e., green bridge or landscape connector) for big game across the

construction right-of-way until pipe is ready to be installed (Forman et al., 2003). Alternatively, PCGP will install soft plugs (backfilled trench materials) in the trench after excavation at these distances to provide wildlife passage. Additionally, 20-foot gaps will be left in spoil and topsoil stockpiles at all hard or soft plug locations and a corresponding gap in the welded pipe string will be left in these locations. Suitable ramps will be installed from the bottom of the trench to the top to prevent potential wildlife entrapment within the trench.

After construction, elk tend to use pipeline rights-of-way for feeding areas, especially when hunting is not occurring (Lees, 1989). The pipeline right-of-way provides an opportunity for developing high quality feeding areas (Lees, 1989) for elk species, especially if noxious weeds are controlled and high quality native forage is seeded. Big-game winter range disturbed during construction will be revegetated with preferred elk forage species as recommended by ODFW, BLM, and Forest Service, including important winter forage species, such as wedgeleaf ceanothus, in riparian areas and areas outside of the 30-foot maintenance corridor on National Forest lands.

The recommendations have been incorporated into the ECRP. The ECRP describes the procedures that will be implemented to minimize erosion and enhance revegetation success, describes the procedures that will be utilized to minimize the spread of noxious weeds as a result of construction, and describes the silvicultural prescriptions that will be implemented in areas that are outside the permanent easement. Seeding mixtures and inhibition of noxious weeds will enhance forage production.

Vegetation within the 30-foot wide maintenance corridor will be periodically maintained by mowing, cutting, and trimming (either by mechanical or hand methods). In upland areas, the 30-foot maintenance corridor will be maintained in a condition where trees or shrubs greater than 6 feet tall will be controlled (cut or trimmed) within 15 feet either side of the centerline (for a total of 30 cleared feet). Maintenance activities are expected to occur approximately every 3-5 years depending on the growth rate of vegetation. During maintenance, vegetation will be cut/trimmed in 4 to 6-foot lengths and scattered across the permanent easement to naturally decompose and to discourage OHV traffic, benefit wildlife habitat, and to decompose naturally. Vegetation management over the long-term will benefit winter range forage for Roosevelt elk.

Approximately 241 acres of forested habitat will be affected within the Rogue River-Siskiyou National Forest. However, PCGP will revegetate 194 acres of the affected area with trees to eventually provide a similar vegetative community to what was present prior to timber clearing. The remaining 47 acres of affected forest will be converted to an herbaceous/shrub vegetative cover for the long-term within the 30-foot maintenance corridor during Pipeline operation, increasing the amount of forage available to big game adjacent to forested stands potentially used for thermal cover.

Forest Plan Consistency. In the Rogue River-Siskiyou National Forest, big game winter range timing limitations are December 1 to April 30. Construction activities would occur within approximately 1.44 miles of designated big game winter range in the Rogue River-Siskiyou National Forest and could occur during those timing limitations. However, PCGP would target the drier periods of the year to construct, where possible, which would minimize disturbance to Roosevelt elk within designated habitat during that period. Additionally, big game travel lanes will not be blocked by construction or operation of the Proposed Action.

Based on management of winter range under guidelines in the Forest Plan, improved winter range conditions and a better balance in winter and summer range could result in a capability to support

up to 2,700 elk (higher than the ODFW benchmark level of 1,750 animals) within 5 or 6 decades past 1990 (Forest Service, 1990d). However, the population productivity shown in Figure 3-1 does not indicate that positive population growth rate has occurred. Roosevelt elk are expected to utilize the pipeline right-of-way for travel and foraging. The Proposed Action would be consistent with the Forest Plan.

3.4 American (Pine) Marten

The Pine marten is an indicator species for all species dependent upon mature and old-growth habitat (Forest Service, 1990d). Pine martens represent those species utilizing mature conifer forests which need mature habitat areas spaced closer than 5 to 6 miles apart. They are not generally found at elevations below 4,000 feet in the Forest and do not appear to have an upper elevation restriction, which makes it an especially important indicator for those species capable of utilizing high elevation habitat or that are less mobile than either the northern spotted owl or pileated woodpecker (Forest Service, 1990a).

The following Standards and Guidelines and Management Prescriptions were identified in the Forest Plan to conserve and manage for pine martens and their habitat:

Applicable Forest Plan Forest-wide Standards and Guidelines. *None specified for MS 26, but these are the general guides for the Forest:*

- Habitat capability objectives have been set in each Management Area, ranging from 40 percent of potential population capability in Areas programmed for intensive timber harvest, to 100 percent of potential capability in Areas with less intensive or no scheduled timber production (Forest Service, 1990d).
- The pine marten uses seral stages III-IV, closed sapling pole, large mature, and old growth, with seral stages V and VI its principal habitat. In 1986, the maximum dispersal distance between habitat areas was recommended to be one habitat for every 4,000-5,000 acres. Juvenile marten dispersal up to 25 miles has been observed (Forest Service, 1990d).
- Home ranges are from 160 acres for females with the males ranging up to 15 miles in their activities. A contiguous area of 160 acres (composed of multi-layered stands with a crown closure equal to or greater than 50 percent in mature or old-growth) is considered the minimum necessary (Forest Service, 1990d).

Management Prescriptions. Based on distributional requirements, management requirements are met with the establishment of 29 pine marten areas above 4,000 feet. The combined habitat networks for the spotted owl, pileated woodpecker, and pine marten, along with intertwined riparian, minimum management and reserved areas, serve as interlocking habitat system for all species utilizing older forest and mature habitat (Forest Service, 1990d).

Species Status in the Pipeline Project Area. Past extensive logging and trapping for pelts led to extirpation in some areas of Oregon; however, martens have been re-introduced to Oregon. In the Rogue River-Siskiyou National Forest, marten are known to occur on the High Cascades, Wild Rivers, Gold Beach and Powers Ranger Districts. There are few and only undocumented records or sighting from the Siskiyou Mountains, namely along the Siskiyou Crest from Mt. Ashland through the Applegate Valley to the Illinois Valley.

Population capabilities were estimated at 250 pairs in 1990 (Forest Service, 1990d). Populations and the mature habitat dependent species they represent are expected to drop 10 to 20 percent

in the first 3 to 5 decades, before returning to 1990 or slightly greater levels in later decades (Forest Service, 1990d). In 1990, there were no comprehensive population surveys. Sightings by the Forest Service have been mapped (with one exception, all sightings were at 4,200 to 6,500 feet elevation) (Forest Service, 1990d). The High Cascades Ranger District conducted numerous presence/absence surveys for forest carnivores throughout the District during the 1990's and 2000's. Throughout these efforts, marten have been found to be prevalent at elevations 4,000 feet and higher. However, an estimate of how many pairs is not available.

ODFW maintains records on Oregon furbearer harvest and catch/unit effort. These records include information on marten in the southern Oregon Cascades and Coast Ranges. Catch/unit effort and total kill is widely variable since 1990, with peaks in the late 1990's. No trend (positive or negative) in population numbers is apparent based on this information (see Table 3-6). Populations in high-elevation habitats are probably stable, but loss of habitat due to human encroachment in low and mid-elevation areas has resulted in population declines and local extirpations (Johnson and O'Neil, 2001).

Table 3-6
Annual County Harvest Summary from ODFW for
Rogue River-Siskiyou National Forest

Forest	County	Total # of martens harvested (1969-present)	Range of years harvest was reported	Range of harvested marten/ year
Rogue River NF	Douglas	167	1971-1992	2-47 /year
	Jackson	47	1973-1994	1-12 /year
	Josephine	0	0	0
	Klamath	525	1969-1995	1-66 per year
	Subtotal	739		
Siskiyou NF	Coos	10	1969-1988	1-4 /year
	Curry	11	1969-1989	1-3 /year
	Josephine	0	0	0
	Subtotal	21		

Habitat. American marten are typically associated with late-seral coniferous forests and closed canopies, large trees, and abundant snags and down wood (Zielinski et al., 2001). Thomas et al. (1993) and FEMAT (1993) also report a strong relationship of marten with riparian areas.

Marten use a variety of structures for rest and den sites. Resting and denning sites offer protection from predation and thermal stress; thus, availability of quality denning sites likely increases the rates of survival and fecundity in marten (Raphael and Jones, 1997). A breeding female pine marten can be supported on 160 acres of quality habitat. Female home range is estimated at 160 acres, although research varies on the necessary size of the area. Pine martens require dead and down material for foraging, cover, and denning, and six down logs/acre is the minimum down material requirement (Forest Service, 1990a). Denning can also take place in slash, snags, and live trees. Densities of snags are relatively high in Montane Mixed Conifer Forests, late-seral stands and naturally provide more dead wood habitat across the landscape than the other habitat types. Montane Mixed Conifer Forests likely provides the best habitat for marten. Only a small portion of the landscape in the lodgepole pine forest, small/medium tree stands are capable of providing dead wood habitat for marten. In Oregon and Washington, lodgepole pine rarely grows large enough to provide denning or resting sites for marten. However, high density piles of smaller

down logs may provide subnivean access points and resting sites (Bull and Blumton, 1999, Bull and Heater, 2000; Jones and Raphael, 1991; Raphael and Jones, 1997).

In addition to providing rest and den sites, down wood is an important component of marten habitat because the primary prey of martens is small mammals associated with down wood. These small mammals include voles (*Microtus sp.*) red-backed voles (*Clethrionomys gapperi*), snowshoe hares (*Lepus americanus*) and squirrels in northeast Oregon (Bull and Blumton, 1999; Bull, 2000). Subnivean (under snow) spaces created by logs provide marten with access to prey during the winter (Bull and Blumton, 1999, Buskirk and Ruggiero, 1994, Sherburne and Bissonette, 1994). Pine martens also eat insects, birds, fruits, and nuts (Forest Service, 1990a).

The marten has a home range of approximately 450 acres. A minimum contiguous area of 160 acres with a crown closure equal to or greater than 50 percent in seral stages V and VI is considered necessary. A maximum spacing of habitat areas (to allow interaction with adjacent animals) is considered to be three miles. Based on distributional requirements, the management requirements of managing habitat to maintain viable populations of wildlife is met with the establishment of 93 pine marten areas above 4,000 feet in elevation (Forest Service, 1990d).

Currently there is far more marten denning and resting habitat available and more habitat within reserve land allocations for marten than was planned for in the original Rogue River National Forest Management Plan. To determine current habitat available for pine marten in the Rogue River-Siskiyou National Forest, highly suitable habitat identified within the NSO habitat model created by Davis et al. (2016) was used as a surrogate for pine marten habitat since both species are an indicator for the same mature/old-growth habitat. According to NSO habitat model (highly suitable habitat), suitable habitat for marten in the Forest is currently approximately 125,939 acres; of that, 83,308 acres (66 percent) are in reserve land allocations with no programmed timber harvest. In addition, there are ninety-five 100-acre spotted owl core areas totaling 9,500 acres identified outside of LSRs on the Cascade side of the Forest that also provide for suitable habitat for marten. It is very likely that the forest is providing a sufficient amount of habitat and in a spatial juxtaposition for far more marten pairs than the 93 originally thought to be needed across the Forest to provide for long term viability for this species. The forest believes that the population trend for this species is likely stable and that population viability will be provided for within reserve lands in the forest.

Pine martens are associated with the following habitat types that occur within the Rogue River-Siskiyou National Forest and which will be affected by construction of the Pipeline: they are closely associated with Montane Mixed Confer Forest and occurrence is uncertain in Southwest Oregon Mixed Conifer-Hardwood Forest (Johnson and O'Neil, 2001).

Forest Management Activities. Pest management should not bother pine martens since they usually occur in recently cut-over areas which they use infrequently. Wildfire would have a serious effect (Forest Service, 1990a) on pine martens by destroying ground and overhead cover and consuming dead and down material.

Effects of the Proposed Action. Within Montane Mixed Confer Forest, pine martens may feed and breed within various forest structural conditions including small tree, medium tree, large tree, and giant tree conditions, single and multi-story, and open moderate and closed canopies, but only if snags, down logs, and/or rock outcrops are present for denning (Johnson and O'Neil, 2001). Removal of approximately 50.77 acres of Montane Mixed Confer Forest over approximately 3.6 miles in the eastern portion of Rogue River-Siskiyou National Forest, of which more than half of the acres crossed are early seral forest (10.04 acres of late successional-old

growth forest, 6.88 acres of mid-seral forest, and 33.85 acres of clearcut-regenerating forest) would affect the equivalent of approximately one-third a female home range (160 acres). It is not expected that removal of 50.77 acres of Montane Mixed Conifer Forest would affect the population of martens on Rogue River-Siskiyou National Forest.

Parturition takes place in March and April, and mating occurs in June through early August. If pine marten home ranges are assumed to be circular, the diameter of a 160-acre home range would be 3,000 feet. Blasting at one edge of that home range (assuming 200 feet of intervening tree cover) would attenuate to 32 dBA at the far edge of the home range and would attenuate to ambient noise (assumed to be 40 dBA) 1,390 feet away. Noise due to construction would be a short term effect (restricted to the period of constriction) to pine martens and expected to affect them only if their home ranges were on or very close to the construction right-of-way.

Mitigation. Mitigation measures that would minimize impacts to pine martens include planting trees within the right-of-way after construction. Conifers would be planted to within 15 feet of each side of the centerline. After tree planting, there will be approximately 12.92 acres of former Montane Mixed Confer Forest (3.3 acres of late successional-old growth, 2.39 acres of mid-seral forest, and 7.22 acres of clear cut-regenerating forest) that will remain in an herbaceous and/or shrub state within the 30-foot maintenance corridor during the life of the Pipeline (Table 3-1).

Approximately 1 mile of forested habitat on Rogue River-Siskiyou National Forest occurs within 0.25 mile of NSO activity centers and will be harvested outside of the NSO breeding season and should not affect breeding or parturition activities of pine martens. Timber removal greater than 0.25 mile of NSO activity centers and construction could occur during the breeding and parturition dates for American marten (March through August); however, the majority of construction within Montane Mixed Conifer Forest occurs within clearcut and regenerating forest (34 acres) and should not affect pine martens denning or resting spots, if present. Also, at least 1 mile of construction within 0.25 mile of NSO activity centers will occur after the NSO critical breeding period (March 1 through July 15) and so should further minimize effects to pine marten, if present. Noise from blasting, if it is required during construction, will be minimized through application of various measures. Mitigation measures commonly applied to blasting of this type include drilling small (2.5-inch) charge holes, stemming the blast holes with sand and placing inert material on top of the blast area (Michael Minor & Associates, 2008).

To mitigate for loss of downed wood and snags within the construction right-of-way, PCGP will create snags in large trees strategically left on the edge of the construction right-of-way by topping and or girdling trees. Those trees will eventually contribute to downed wood along the right-of-way. Previously, PCGP had agreed to fund other projects proposed by the Forest Service in the Rogue River - Siskiyou National Forest that would provide benefits to American marten within the Rogue River - Siskiyou National Forest. The Forest Service will be reviewing these projects to verify their relevance to the current proposed Pipeline and implementation of these previously proposed projects or similar will be included in the CMP. Projects previously agreed to included creating snags and placing large wood in habitats adjacent to the proposed Pipeline to meet the management objectives of snag densities and enhance areas deficient in coarse woody material. The proposal to create snags and place large wood (previously proposed up to 1,100 acres) would accelerate the development of late successional habitat characteristics of structure and diversity (snags/large wood) and would create structure by placing large wood across the corridor for use by pine martens and other small wildlife species (large wood). The project would also reduce localized fuel loads while improving habitat in deficient stands (large wood) and provide long-term structure in the event of fire since larger logs maintain moisture longer and are less likely to be fully consumed by fire.

Additionally, PCGP agreed to fund or undertake other projects proposed by the Forest Service in the Rogue River-Siskiyou National Forest such as decommissioning 53 to 57.5 miles of roads, commercial and/or pre-commercial thinning on up to 1,240 acres to accelerate development of late successional and old growth habitat characteristics, among other objectives, and reallocating 593 acres from matrix to LSR designation so that forested habitat within former matrix lands will be managed to obtain late successional forest characteristics. Those additional projects would provide benefits to pine martens within the Rogue River - Siskiyou National Forest.

Forest Plan Consistency. Implementation of the mitigation measures is expected to increase potential population capabilities for pine martens in areas that would otherwise be subject to intensive timber harvest and would provide for additional interlocking habitats for species utilizing older forest and mature habitat. In these respects, the Proposed Action would be consistent with the Forest Plan.

3.5 Pileated Woodpecker

The pileated woodpecker is an indicator species for all species dependent upon mature habitat (Forest Service, 1990d). Pileated woodpeckers represent primary cavity-creating and cavity-dwelling species that use large, standing dead trees and mature/old-growth timber when nesting, roosting, and foraging (Forest Service, 1990d). The pileated woodpecker represents over 160 wildlife species utilizing mature forest habitat (Forest Service, 1990a).

The following Standards and Guidelines and Management Prescriptions were identified in the Forest Plan to conserve and manage for pileated woodpeckers and their habitat:

Applicable Forest Plan Forest-wide Standards and Guidelines. Nothing is specified in MS 26 for the pileated woodpecker, although there are specifications for woodpeckers generally, as described in the following section. These are general for the Forest:

- Habitat areas should be 300 acres in size, distributed at least every five and one-half miles, with no programmed timber harvest (Forest Service, 1990d).
- Older forest habitat of 300 acres (trees having diameters of 25 inches dbh or greater) are considered necessary for each pair. Areas should be within 5 miles of each other, center to center, and evenly spaced to allow interaction of birds between suitable territories (Forest Service, 1990a).

Management Prescriptions. Specifications for the pileated woodpecker (from "A Report on Minimum Management Requirements for Forest Planning on the National Forests of the Pacific Northwest Region, USDA Forest Service," June 1986) include a five-mile maximum dispersal distance to one habitat area for every 12,000 to 13,000 acres. The size of areas used by pairs during nesting season has ranged from 320 acres in eastern Oregon to 1,357 acres in western Oregon, and the management requirement calls for 300 acres of old growth or mature timber containing at least 45 snags greater than 20 inches, plus 300 acres of feeding area (Forest Service, 1990a).

Downed logs serve as important sources of food and 300 acres of mature and old-growth timber (trees having diameters of 21-inches DBH or greater) are considered necessary for each pair. Areas should be within 5 miles of each other, center-to-center, and evenly spaced over the Forest to allow interaction of the birds between suitable territories. Based on distributional requirements, the MR of managing habitat to maintain viable populations of wildlife is met with the establishment of 57 pileated woodpecker areas (Forest Service, 1990a).

When possible, 300 contiguous acres of conifers in seral stage V or VI should be maintained. If not possible, habitat may be arranged in blocks of no less than 50 acres and no more than one quarter mile apart (Forest Service, 1990d)

There are timing limitations from March 1 to July 31, as well as construction constraints, calling for no disturbance within 1,320 feet of active pileated woodpecker nests (Forest Service, 1990d).

Species Status in the Pipeline Project Area. The Forest Service has no historical trend data for the pileated woodpecker; however, the trend of mature and old-growth habitat has been downward, with an estimated 74 percent loss since mid-1800s. Until the early 1970s, few snags, large down woody material or green replacement trees were left in treated stands, and snags were actively cut to avoid fire hazard. As a result, habitat capability is probably less than the trend in mature and old-growth habitat would indicate. However, as long as sufficient large diameter dead trees and downed material are present, pileated woodpeckers appear to be less sensitive to modifications of mature habitat than some other mature habitat dependent species (Forest Service, 1990a).

As of 1990, there were no population surveys. Some non-mature seral stages can provide part of a woodpecker's needs, and a predictive model recognizing varying population densities by seral stage was developed. This model indicates that a population of approximately 900 birds may be supportable. Based on distributional requirements, the Management Requirements for the Forest are met with nine pileated woodpecker areas (Forest Service, 1990a).

The population capability in 1990 was estimated at 930 pileated woodpecker pairs (Forest Service, 1990d). Populations and the mature habitat dependent species they represent were expected to drop 10 to 20 percent in the first 3 to 5 decades after the Plan, before returning to 1990 or slightly greater levels in later decades (Forest Service, 1990d). In June 1998, a pileated woodpecker was recorded just west of the Forest Service Boundary, approximately 1.7 miles from the Proposed Action (BLM, 2006).

The same data that were collected on 17 National Biological Survey BBS routes (Pardieck et al., 2017) that are within approximately 50 miles of the Rogue River-Siskiyou National Forest and Pipeline and used to evaluate the regional population trend for BCR 5 are discussed in Section 1.1. During a 20-year period from 1997 through 2016, pileated woodpeckers appear to be relatively stable (neither increasing nor decreasing on BBS routes) on BBS routes within the Pipeline vicinity including the Rogue River-Siskiyou National Forest in BCR 5 (Figure 2-1)

Habitat. Pileated woodpeckers are found primarily in dense mixed-conifer forests or in deciduous tree stands in valley bottoms. They use mature and older, closed canopy stands for nesting and roosting, but may use younger (40-70 years), closed-canopy stands for foraging if large snags are available; large snags and decadent trees are critical habitat components for pileated woodpeckers; down logs do not appear to be an important foraging substrate for pileated woodpeckers on the west side of Oregon and Washington (Hartwig et al. 2004, Mellen et al. 1992, Raley and Aubry 2006). A new nest cavity is excavated each spring, usually in a dead tree, by each pair. Nest cavities are quite large (mean diameter of 8 inches and depth of 22 inches) and are excavated at an average height of 50 feet above the ground. A pair shares and defends the territory all year, and home ranges are large (Marshall et al., 2006).

In the Rogue River-Siskiyou National Forest, pileated woodpeckers forage exclusively on carpenter ants and wood-boring beetle larvae, mostly in decayed wood (Forest Service, 1990a). Older forest habitat meets foraging needs, and other areas next to and including clearcuts with

snags and large down woody material are also used (Forest Service, 1990d). Downed logs are important substrates from which food is obtained. For foraging, the most important things are the presence of the correct sizes and numbers of snags and down logs. The pileated woodpecker, as the largest cavity excavator, is important to cavity users that are incapable of creating their own cavities (Forest Service, 1990a).

Currently, there is far more pileated woodpecker habitat available and more habitat within reserve land allocations for pileated woodpeckers than was planned for in the original 1990 Rogue River Resource Management Plan (Forest Service, 1990d). To determine current habitat available for pileated woodpeckers in Rogue River National Forest, the NSO suitable nesting habitat created by Davis et al. (2016) was used as a surrogate for pileated woodpecker habitat since both species are an indicator for the same mature/old-growth habitat. In addition to the NSO suitable nesting habitat, snag habitat has also been identified as an indicator for pileated woodpeckers. To quantify current snag habitat, fire perimeters and documented tree mortality from the Region 6 Aerial Insect and Disease surveys from the past 10 years (2008 - 2017) were counted as suitable snag habitat for pileated woodpeckers to forage in (Table 2-3). Using both the NSO habitat model and snag habitat created by wildfire and insects, there are 246,763 acres of current habitat; of that, 160,718 acres (65 percent) are in reserve land allocations with no programmed timber harvest. There are still one hundred and fifty-three 100-acre spotted owl core areas totaling 15,300 acres identified outside of LSRs for the Rogue River National Forest. These core areas also provide suitable habitat for Pileated woodpecker. It is very likely that the Rogue River-Siskiyou National Forest is providing habitat for more pileated woodpecker pairs than the 57 originally thought to be needed across the Forest to provide for long term viability for this species. As a result, it is assumed that the population trend for this species is trending up and that viability will be provided for within reserve lands in the Rogue River-Siskiyou National Forest.

Pileated woodpeckers are generally associated with Montane Mixed Conifer Forest and Southwest Oregon Mixed Conifer-Hardwood Forests (Johnson and O'Neil, 2001) that coincide with the Proposed Action (Table 3-1). Since they are dependent on downed wood and snags, pileated woodpeckers would be most likely to inhabit the old growth or late successional stands (≥80 years old) of those forests included in Table 3-1. However research suggests that only a small portion of the landscape in the Southwest Oregon Mixed Conifer-Hardwood Forest, late-seral stands are likely capable of providing nesting and roosting habitat for pileated woodpecker based on snag densities on unharvested plots (see Mellen-McLean et al., 2009).

Forest Management Activities. Pest management that includes spray would have a detrimental effect. Wildfire would destroy nesting and foraging habitat, but also creates new snag habitats and attracts insect infestations (Forest Service, 1990a).

Timber harvest has the most significant effect on habitat for this woodpecker. Forest fragmentation reduces population density and makes birds more vulnerable to predation. Harvesting and prescribed burning that eliminates or reduces the number of snags, logs, and cover are detrimental (Marshall et al., 2006).

Effects of the Proposed Action. Pileated woodpeckers could be negatively impacted during construction of the Pipeline through the same direct and indirect effects that were discussed in Section 1.1 above, for the Umpqua National Forest. Trees will be felled before April 1 and after July 15, outside of the primary migratory bird nesting season; felling trees at these time periods will avoid directly impacting active nests during the nesting season. However, other timber removal activities (timber removal, brushing) and construction of the Proposed Action could occur during the breeding season of pileated woodpeckers (March 1 through July 31) and disturb

nesting pileated woodpeckers if located within 0.25 mile of the Proposed Action. Clearing the right-of-way will modify habitat, changing the seral stage and tree species makeup of occupied forests. Construction will remove 10.04 acres of late successional-old growth Montane Mixed Conifer Forest and 68.14 acres of late successional-old growth Southwest Oregon Mixed Conifer-Hardwood Forests (Table 3-1). Also, 35.51 acres of late successional-old growth will be affected within UCSAs, an expected short-term disturbance. Additional potential long-term effects to pileated woodpeckers will be removal of 17.17 acres of mid-seral conifer-hardwood forest (≥40 years but ≤80 years old), thereby setting back seral development that would be expected to eventually provide suitable habitat elements for pileated woodpeckers, including downed wood and snags.

The amount of late successional-old growth habitat that would be removed by the Pipeline is not expected to have an impact on the local or regional population of pileated woodpeckers which have mean home ranges of 478 hectares or 1,180 acres in western Oregon (Mellen, 1987; Mellen et al., 1992). If all of the impacted late successional-old growth (78.18 acres) occurred within a bird's or pair's home range, less than 6.5 percent of one home range would be affected. More likely, the Proposed Action would span several home ranges and the overall effect to any single bird or pair would be less than 6.5 percent removal.

If pileated woodpecker home ranges are assumed to be circular, the diameter of a 1,180-acre home range would be 8,090 feet. Blasting at one edge of that home range would attenuate to 30 dBA at the far edge of the home range and would attenuate to ambient noise (assumed to be 40 dBA) 4,630 feet away or a distance equal to 57 percent the diameter of a home range. Noise due to construction would be a short term effect to pileated woodpeckers and would be expected to affect them within only a portion of their home ranges.

Mitigation. Mitigation measures that would minimize potential impacts to pileated woodpeckers include planting trees within the right-of-way after construction. Conifers would be planted to within 15 feet of each side of the centerline. After tree planting, there will be 46.71 acres of former forest (23.17 acres of late successional-old growth, 5.46 acres of mid-seral forest, and 18.07 acres of clear cut-regenerating forest) that will remain in an herbaceous and/or shrub state within the 30-foot maintenance corridor during the life of the Pipeline (Table 3-1).

Timber felling will occur before April 1 and after July 15, outside of the primary migratory bird nesting season. Other timber removal activities (i.e., timber removal) and construction of the Proposed Action could occur during the breeding season of pileated woodpeckers (March 1 through July 31) and disturb nesting pileated woodpeckers if located within 0.25 mile of the Proposed Action. However, disturbance would be minimized in at least 1 mile of the Proposed Action on Rogue River-Siskiyou National Forest where NSO activity centers occur within 0.25 mile of the Proposed Action and construction activities would not occur during the NSO critical breeding period (March 1 through July 15). In this same area of NSO presence, timber harvest would occur outside of the entire NSO breeding season (after September 30 but before March 1). Felling trees during this time period will avoid directly impacting young birds during the nesting season. Noise from blasting, if it is required during construction, will be minimized through application of various measures. Mitigation measures commonly applied to blasting of this type include drilling small (2.5-inch) charge holes, stemming the blast holes with sand and placing inert material on top of the blast area (Michael Minor & Associates, 2008).

To mitigate for loss of cavities and snags within the construction right-of-way, PCGP will create snags in large trees strategically left on the edge of the construction right-of-way by topping and or girdling trees. Previously, PCGP had agreed to fund other projects proposed by the Forest

Service in the Rogue River - Siskiyou National Forest that would provide benefits to pileated woodpeckers within the Rogue River - Siskiyou National Forest. The Forest Service will be reviewing these projects to verify their relevance to the current proposed Pipeline and implementation of these previously proposed projects or similar will be included in the CMP. Projects previously agreed to included creating snags and placing large wood in habitats adjacent to the proposed Pipeline to meet the management objectives of snag densities and enhance areas deficient in coarse woody material. The proposal to create snags and place large wood (previously proposed up to 1,100 acres) would accelerate the development of late successional habitat characteristics of structure and diversity (snags/large wood) including suitable nesting structures for pileated woodpeckers. The project would also reduce localized fuel loads while improving habitat in deficient stands (large wood) and provide long-term structure in the event of fire since larger logs maintain moisture longer and are less likely to be fully consumed by fire.

Additionally, PCGP previously proposed to fund or undertake other projects proposed by the Forest Service in the Rogue River-Siskiyou National Forest such as decommissioning 53-57.5 miles of roads, commercial and/or pre-commercial thinning on up to 1,240 acres to accelerate development of late successional and old growth habitat characteristic among other objectives, and reallocating 593 acres from matrix to LSR designation so that forested habitat within former matrix lands will be managed to obtain late successional forest characteristics. Those additional projects would provide benefits to pileated within the Rogue River-Siskiyou National Forest. During construction, potential impact to nesting pileated woodpeckers and other species by predatory corvids will be addressed by assuring that all contractors practice appropriate trash containment and removal.

PCGP has also prepared a Migratory Bird Conservation Plan that identifies additional measures that would benefit pileated woodpeckers.

Forest Plan Consistency. A viability assessment was completed by the Forest Ecosystem Management Assessment Team (FEMAT, 1993). The viability outcome for the pileated woodpecker was 100 percent likelihood of Outcome A – "Habitat is of sufficient quality, distribution, and abundance to allow the species population to stabilize, well distributed across federal lands" (Forest Service and BLM, 1994). This outcome determination was based on provisions of: 1) a large system of late-successional reserves, 2) standards and guidelines for riparian reserves, and 3) retention of green trees, snags, and coarse woody debris within the matrix. The Forest Service has been implementing the NWFP and monitoring late-successional habitat trends since 1994. The 10-year monitoring report (Haynes et al. 2006) states "…it appears that the status and trends in abundance, diversity, and ecological functions of older forests are generally consistent with expectations of the Plan. The total area of late-successional and old-growth forest (older forests) has increased at a rate that is somewhat higher than expected, and losses from wildfires are in line with what was anticipated." As a result, projects consistent with the NWFP should be expected to maintain viability of late-successional associated species such as the pileated woodpecker.

Implementation of the mitigation measures is expected to increase potential population capabilities for pileated woodpeckers in areas that would otherwise be subject to intensive timber harvest and would provide for additional habitats for species utilizing older forest and mature habitat. In these respects, the Proposed Action would be consistent with the Forest Plan. Although some timber felling and construction (at least 1 mile where NSO occur within 0.25 mile of the Proposed Action; before April 1 and after July 15 – outside of the migratory bird primary nesting season) would occur outside of the pileated woodpecker nesting season, most other timber clearing activities and construction could occur during the pileated woodpecker nesting

season (nesting season: March 1 – July 31), potentially within 1,320 feet of an active pileated woodpecker nest. If that occurred, the action would not be consistent with the Forest Plan. See PCGP's Migratory Bird Conservation Plan that describes measures that would benefit pileated woodpeckers.

3.6 Primary Cavity Excavators (nesters)

Primary cavity excavators represent those animals which require dead and defective woody material for nesting, roosting, and foraging. They are the common (northern) flicker (*Colaptes auratus*), hairy woodpecker, and downy woodpecker. This also includes the pileated woodpecker, which is discussed separately (Forest Service, 1990d). Snags and down logs, fairly uniformly distributed, provide critical habitat (Forest Service, 1990d).

The following Standards and Guidelines and Management Prescriptions were identified in the Forest Plan to conserve and manage for primary cavity excavators and their habitat:

Applicable Forest Plan Forest-wide Standards and Guidelines.

- To satisfy cavity nester habitat requirements at 60 percent of their potential maximum population, about 200 snags (ranging from 11 inch diameter to over 25 inch diameter) are needed per 100 acres. Snags must be provided continuously through time, and usable snag life is considered to be 20 to 30 years depending on the tree species (Forest Service, 1990a).

Woodpeckers Management Prescriptions. *MS 26, Restricted Riparian*

- For other details on MS 26, see Deer.
- Leave sufficient wildlife trees in coniferous forests to provide for 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 as follows:

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 this does not exist, the proper number will be selected from the next lower class. Material that satisfies the need for down woody material recruitment will come from existing down material that is a result of a silvicultural treatment and from trees that are designated to meet standing wildlife tree requirements. The long-term LWM goal is 10 to 20 pieces of class I and II logs per acre, and all existing class III, IV, and V, except for incidental amounts.

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 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 stand being treated.

Down woody material will be included as part of the silvicultural prescription for each stand, with information for the prescription provided by a wildlife biologist site by site. A certified silviculturist will validate the data and include it in the preparation of the final prescription. The logging system required, reforestation needs, slash disposal requirements, and site preparation needs should be compatible with tree distribution needs.

Primary cavity excavator habitat will be met on areas no larger than 60 acres, including adjacent harvest units, in order 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 do not exceed

60 acres. Where past harvest units were very large, adjacent stands within 900 feet would be managed at higher wildlife tree levels to bring the overall area to the 40 percent level. When past harvest units were so large that these methods cannot bring the area to the 40 percent level, the remaining shortage will not be provided for, but will be recorded and tracked. 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, until 5 to 7 years after Pipeline completion, in order to capture any mortality that may occur during that time (Forest Service, 1990d).

Species Status in the Pipeline Project Area. In 1990, it was thought that there was a population capability of 49,000 cavity excavator pairs (woodpeckers other than pileated woodpeckers) in the Forest (Forest Service, 1990d). There was no comprehensive inventory, although they are assumed to be highly correlated to snag levels (Forest Service, 1990a). Based on the 1990 assessment, woodpecker populations (as based on mixes of forest habitat types) would remain relatively constant through the fourth decade and then would increase to 100 percent of populations existing previous to the Plan in the fifth decade (Forest Service, 1990d). It was also expected that habitat capability would remain relatively stable or slightly rise through the fifth decade because more snags would be designated to remain than in the past (Forest Service, 1990d).

The historic trend estimates show that woodpeckers seem to be decreasing due to loss of snag habitat through timber harvest and firewood cutting activities. The viable population that would preserve the gene pool is undetermined. The habitat needed to maintain primary cavity excavators at 20 percent of their potential population (minimum viable level) is considered to be 45 snags per 100 acres. The habitat to maintain viable population levels where the species have an opportunity to interact within their environment is 135 snags per 100 acres, ranging in sizes from 11-inch dbh to 25-inch or greater dbh, which equates to 40 percent of their potential population level. Based on these parameters, a population model predicts an existing population of over 60,000 other woodpeckers (Forest Service, 1990a). In 1994 and 1998, a hairy woodpecker was documented just outside Rogue River-Siskiyou Forest Service boundaries, approximately 2.6 to 2.8 miles from the Proposed Action (BLM, 2006). In unmanaged forested areas, the total cavity excavator population is limited by territorial needs, not by the availability of wildlife trees (snags). When the FEIS was written, there was a wide range of cavity excavator population capability, from 100 percent in areas not under managed rotation to zero in some areas harvested before the 1980s (Forest Service, 1990a).

The same data that were collected on 17 National Biological Survey BBS routes (Pardieck et al. 2017) that are within BCR 5 in approximately 50 miles of the Proposed Action and Rogue River-Siskiyou National Forest and used to evaluate the regional population trends are discussed in Section 2.2. Numbers of northern (common) flicker, hairy woodpecker, and downy woodpecker that were reported on each route were compiled and averaged (numbers per route) for each year, 1997 through 2016 (Table 3-7) to develop a population index.

Table 3-7
Data Compiled for 20-years and Trends of Population Indices (Numbers Counted per BBS Route per Year) for BCR 5 of Primary Cavity Excavator MIS in the Vicinity of Rogue River-Siskiyou National Forest and the Pipeline

Cavity Nesting Species	Data Compiled for 20 Years, 1993-2012			
	Average Number of Routes per Year[1]	Average Annual Count per Route [1]	Population Index Trend	Comments
Common (Northern) Flicker	10.75	3.68	No trend	none
Hairy Woodpecker	10.45	1.10	Significantly decreasing (P < 0.01)	none
Downy Woodpecker	8.45	0.71	Insufficient data	Too few observations per year

[1] Data from BBS routes in Bird Conservation Region 5 within 50 miles of the Proposed Action.

During the 20-year period (1997-2016), an average of 3.68 northern flickers was observed per BBS route (observed on average of 10.75 routes per year) each year in BCR 5 in approximately 50 miles of Rogue River-Siskiyou National Forest and the Proposed Action. Over the past 20 years, hairy woodpecker populations appear to be significantly decreasing (P < 0.01) on BBS routes within the vicinity of Rogue River-Siskiyou National Forest and the Proposed Action (Table 3-7 and Figure 3-2). Northern flickers are also decreasing in BCR 5 within the vicinity of the Rogue River-Siskiyou National Forest and the Proposed Action, but no significant trend is detectible reviewing both the long-term trend (20-year trend) (Table 3-7). In addition to pileated woodpeckers discussed above, northern flickers and hairy woodpeckers are the only other species of cavity nesters included as a MIS with sufficient data to estimate 20-year population trends, indexed as annual counts per route.

Habitat. All the primary cavity nester MIS species require snags of appropriate size, species, condition, and density, but these snags must be provided in the right habitat type. Sub-sections below, for each species summarizes the general habitat type for each species.

Hairy Woodpecker Habitat. In Oregon, the hairy woodpecker can be found in both dry and wet coniferous forests at low to mid-elevations, with the exception of juniper forests. They are found primarily in mixed-conifer and ponderosa pine forests. Hairy woodpeckers also use deciduous forest and riparian areas, especially if adjacent to coniferous forest. Although hairy woodpeckers have been reported to use forested stands at various seral stages (Marshall et al., 2003; Wahl et al., 2005), on the west side of the Cascades they occur in higher densities in mature and old-growth stands. They are common throughout most of their range, although most common in burns or in areas with trees that are dead from or infested with mountain pine beetles, and uncommon to fairly common along the coast and in western interior valleys. They prefer to nest in dead trees with light to moderate decay, and few consistent seasonal movements are known (Marshall et al., 2006).

Hairy woodpeckers are generally associated with the following habitat types that will be affected within the Rogue River-Siskiyou forest: Montane Mixed Conifer Forest, Southwest Oregon Mixed Conifer-Hardwood Forests, and Urban and Mixed Environs. They are present in Westside Grasslands but are expected to feed and breed within the habitats with which they are generally associated (Johnson and O'Neil, 2001). Using DecAID version 2.1 (Mellen-McLean et al., 2009), general snag characteristics used by hairy woodpeckers for each habitat type could be determined. Within forest types affected by the Proposed Action, hairy woodpeckers are generally associated with moderate to hard snag decay, with the exception of Southwest Oregon Mixed Conifer-Hardwood Forest where all classes of snag decay are used, within Douglas-fir,

ponderosa pine, and western hemlock species. Snag size and density of snags per acre are variable, but the hairy woodpecker tends to be associated with smaller snag sizes that the other MIS species.

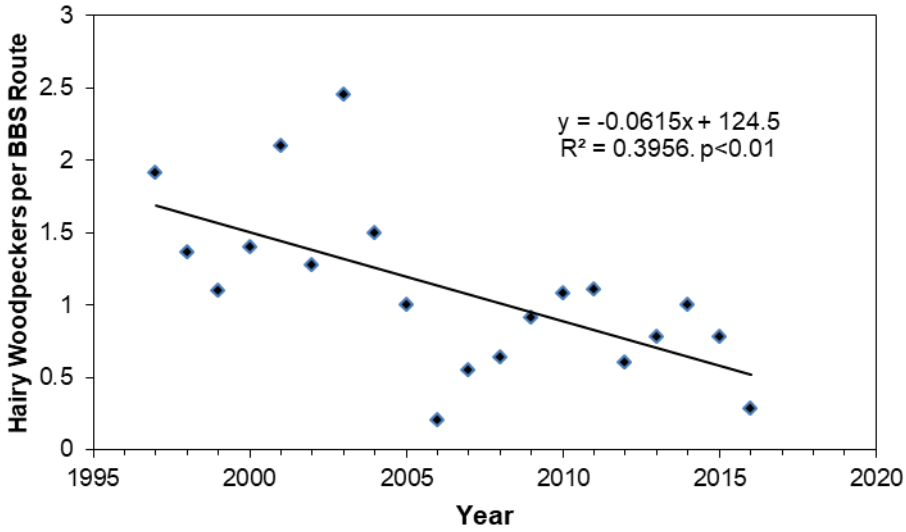

Figure 3-2
20-year Trend in Hairy Woodpeckers Counted per BBS Route
in BCR 5 in the Vicinity of Rogue River-Siskiyou National Forest and the Pipeline

Downy Woodpecker Habitat. The downy woodpecker is found at low to moderate elevations in deciduous (alder, cottonwood, willow, aspen, and oaks) and mixed deciduous-coniferous forests, and is most abundant in riparian areas and red alder. They show a preference for decayed wood for nesting. Some local movements occur in fall/winter as some individuals move to lower elevations. They nest primarily in dead trees (Marshall et al., 2006; Wahl et al., 2005).

Downy woodpeckers are generally associated with the following habitat types that will be affected within the Rogue River-Siskiyou forest: Southwest Oregon Mixed Conifer-Hardwood Forests, and Urban and Mixed Environs. They are present in Westside Grasslands but are expected to feed and breed within the habitats with which they are generally associated (Johnson and O'Neil, 2001). Using DecAID version 2.1 (Mellen-McLean et al., 2009), general snag characteristics used by downy woodpeckers for each habitat type could be determined. Within forest types affected by the Proposed Action, downy woodpeckers are generally associated with moderate to hard snag decay within Douglas-fir, red alder, ponderosa pine, and golden chinquapin tree species. Snag size and density of snags per acre are variable.

Northern Flicker Habitat. The northern flicker is the most ubiquitous woodpecker in Oregon including the vicinity of the Proposed Action (Table 3-7). Northern flickers are most abundant in open forests and forest edges adjacent to open country. They typically avoid dense forest, and prefer to nest in trees with some decay. Some flickers move to higher elevations in spring (Marshall et al., 2006).

Northern flickers are generally associated with the following habitat types that will be affected within the Rogue River-Siskiyou forest: Montane Mixed Conifer Forest, Southwest Oregon Mixed Conifer-Hardwood Forests, Westside Grasslands, and Urban and Mixed Environs. They are present in Shrub-steppe but are expected to feed and breed within the habitats with which they

are generally associated (Johnson and O'Neil, 2001). Using DecAID version 2.1 (Mellen-McLean et al., 2009), general snag characteristics used by northern flickers for each habitat type could be determined. Within forest types affected by the Proposed Action, northern flickers are generally associated with soft to moderate snag decay, with the exception of Southwest Oregon Mixed Conifer-Hardwood Forest where all classes of snag decay are used, within Douglas-fir, ponderosa pine, western hemlock, and oak species. Snag size and density of snags per acre are variable, but the northern flicker tends to be associated with larger snag sizes than the other two species.

Forest Management Activities. Depending on the target species, pest management would serve to remove a part of the species' food choice. Wildfire destroys nesting and foraging habitat, but also creates new snag habitat and weakens other trees to the point where they become infected with disease and insects, increasing the food supply. Timber harvesting and firewood cutting are the major activities that affect woodpeckers. The removal of snags and down/dead material would continue the downward trend in population levels (Forest Service, 1990a).

Effects of the Proposed Action. Primary Cavity Excavators could be negatively impacted during construction of the Pipeline through the same direct and indirect impacts that were discussed above for the pileated woodpecker (Section 2.2), for the Umpqua National Forest.

Clearing the right-of-way will modify habitat, changing the seral stage and tree species makeup of occupied forests. Similar to effects to pileated woodpeckers discussed above in Section 2.4, construction will remove a total of 78.18 acres of late successional-old growth Montane Mixed Conifer Forest and Southwest Oregon Mixed Conifer-Hardwood Forests in Rogue River-Siskiyou National Forest (Table 3-1). Additional potential long-term effects to Primary Cavity Excavators will be removal of 17.17 acres of mid-seral conifer-hardwood forest (≥40 years but ≤80 years old), thereby setting back seral development that would be expected to eventually provide suitable habitat elements including snags.

Unlike the large home ranges of pileated woodpeckers, those of the other Primary Cavity Excavator MIS are relatively small at 10 ha (25 acres) for the downy and hairy woodpeckers and 50 ha (124 acres) for the northern flicker (Johnson and O'Neil, 2001). While the amount of late successional-old growth habitat that would be removed by the Proposed Action is not expected to impact local or regional populations of Primary Cavity Excavators, home ranges of several individuals or pairs could be affected.

If Primary Cavity Excavator MIS' home ranges are assumed to be circular, the diameter of a 25-acre home range would be 1,170 feet and that of a 124-acre home range would be 2,600 feet. Blasting at one edge of a home range would attenuate to 55 dBA (at 1,170 feet) or 46 dBA (at 2,600 feet) at the far edges of the home range, depending on home range size. Noise due to construction would be a short term effect to Primary Cavity Excavators and expected to affect them through home ranges since noise levels would be above ambient levels (assumed to be 40 dBA) throughout species' home ranges that are adjacent to the construction right-of-way.

Mitigation. The same mitigation measures that were discussed in Section 3.5 for pileated woodpeckers would also apply to and benefit primary cavity excavators. PCGP has also prepared a Migratory Bird Conservation Plan that identifies additional measures that would benefit primary cavity nesters.

Forest Plan Consistency. Implementation of the mitigation measures is expected to increase potential population capabilities for primary cavity excavators in areas that would otherwise be subject to intensive timber harvest and would provide for additional habitats for species utilizing

older forest and mature habitat. In these respects, the Proposed Action would be consistent with the Forest Plan.

Timber felling will occur before April 1 and after July 15, outside of the migratory bird primary nesting season; additionally, some timber felling and construction (at least 1 mile where NSO occur within 0.25 mile of the Proposed Action) would occur outside of the primary cavity nester breeding seasons. However, some timber felling, and most timber removal and construction activities could occur during the respective nesting season (nesting season: downy woodpecker April 15 to August 31, hairy woodpecker March 1 to August 31, and northern flicker March 15 to August 31; Johnson and O'Neil, 2001), potentially within 1,320 feet of an active primary cavity nester nest. If that occurred, the action would not be consistent with the Forest Plan. See PCGP's Migratory Bird Conservation Plan that describes measures that would benefit primary cavity nesters.

4.0 FREMONT-WINEMA NATIONAL FOREST

Species. The MIS for the Fremont-Winema National Forest include the three-toed woodpecker, pine marten, northern spotted owl, pileated woodpecker, resident trout, mule deer, bald eagle and northern goshawk (Forest Service, 1990e). The bald eagle was listed as threatened or endangered species requiring special management at the time of the Forest Plan's release, but has since been delisted. However, it is included in this discussion because it still remains an indicator species under the current Forest Plan. Old growth communities are used by the northern spotted owl, pileated woodpecker, northern goshawk, three-toed woodpecker, and pine marten. (Forest Service, 1990e). However, the northern spotted owl is now listed under the Endangered Species Act and its status is covered extensively under separate cover in the Biological Assessment and is not discussed here.

Management areas 3A, Scenic Management-Foreground Retention, 3B, Scenic Management-Foreground Partial Retention, 3C, Scenic Management-Middleground Partial Retention, and 18 will be affected by the Pipeline.

Habitats. The anticipated Future Condition which was expected in 1990 to have been met by 2000 is that mature and old-growth habitat would decrease but be maintained at or above levels determined to be needed for viable wildlife populations by the Region 6 guide. The condition of the riparian area and the habitat effectiveness for historic big game winter range was expected to have improved. Summer range habitat effectiveness for deer was expected to be at 1990 levels or higher. It was not anticipated that mule deer populations would increase above 1990 levels when based on the assumption of a direct relationship between deer production and habitat. A mule deer study to determine causes of decline would have been completed. The Forest would have provided habitat to meet bald eagle recovery objectives. (Forest Service, 1990e).

It was predicated that fifty years past the time of the 1990 report, riparian areas and streams would have been improved to provide for increased fish production by the third decade, and the fish program would consist primarily of reconstruction and maintenance of improvements. Deer production and populations would remain low. Plans would have been implemented for the recovery of threatened and endangered species and for the management of sensitive species. (Forest Service, 1990e).

MIS in the Fremont-Winema National Forest are associated with a variety of habitats found throughout the forest. However, the Pipeline will affect only those habitats included in Table 4-1, below. In Table 4-1, the areas (acres) of existing forested habitats (Southwest Oregon Mixed Conifer-Hardwood Forest and Ponderosa Pine Forest and Woodlands) within one or more seral stages (clearcut-regenerating forest, mid-seral forest, late successional-old growth forest) that will be removed during construction and affected during operation are provided in addition to all other affected habitat type categories. Effects from the Proposed Action have been summarized by component during construction and during operation. Generally, most long-term disturbance is due to a 30-foot wide corridor, centered on the pipeline, that is maintained in a herbaceous and/or shrub stated for the life of the Pipeline. Table 4-1 is referenced in discussions for each MIS in the sections, below.

The forested habitats (Johnson and O'Neil, 2001) correspond to vegetation categories described by the Oregon Gap Analysis Project (Oregon Gap; Kagan et al., 1999) and generally mapped within 100 meters of the Pipeline project. For Southwest Oregon Mixed Conifer-Hardwood Forest, the corresponding vegetation categories include 1) Douglas-fir-White Fir/Tanoak-Madrone Mixed

Forest, and 2) Douglas-fir Dominant-Mixed Conifer Forest (Kagan et al., 1999) and were discussed above for the Umpqua National Forest. Likewise, Montane Mixed Conifer habitat (Johnson and O'Neil, 2001) in Table 4-1 was discussed above for the Rogue River-Siskiyou National Forest. Descriptions of Forested and Non-Forested Wetlands were provided in those sections under the Umpqua National Forest and a description of Westside Grasslands was provided for the Rogue River-Siskiyou National Forest. However, Eastside Grasslands also occur within the Fremont-Winema National Forest:

Grasslands (east of Cascades)/Forest-Grassland Mosaic: This type is a mosaic of bunchgrass grasses and conifer forest in the east Cascades. Ponderosa pine, Douglas-fir, white fir, and incense cedar are common conifers, with Idaho fescue generally the dominant grass. Other grasses that can form co-dominances are bluebunch wheatgrass, junegrass, Sandberg bluegrass, and western needlegrass. In stands heavily grazed, cheatgrass and bottlebrush squirreltail can be dominant. Found at mid to low elevations (Kagan et al., 1999).

Table 4-1
Summary of Construction and Operation-Related Disturbance (acres [1]) to Corresponding Wildlife Habitat Categories (Johnson and O'Neil, 2001) in the Fremont-Winema National Forest

Component	Forest –Woodland Seral Stage [2]	Forest-Woodland			Riparian		Grasslands	Roads	Open Water	Total
		Montane Mixed Conifer Forest	Southwest Oregon Mixed Conifer-	Forest-Woodland Sub-Total	Forested Wetland	Non-Forested Wetland				
CONSTRUCTION DISTURBANCE										
Pipeline Facilities										
Construction Right-of-Way	**L-O**	5.77	30.67	36.44	0.26		0.69	1.38	0.07	68.62
	M-S	2.49	3.94	6.43						
	C-R	14.62	8.74	23.36						
	Tot	22.88	43.35	66.23						
Hydrostatic Discharge Sites	**L-O**									0
	M-S									
	C-R									
	Tot									
Rock Source/ Disposal	**L-O**									0
	M-S									
	C-R									
	Tot									
Temporary Extra Work Areas	**L-O**	0.53	4.13	4.66			0.22	1.58		12.04
	M-S	0.29	1.1	1.39						
	C-R	3.54	0.64	4.18						
	Tot	4.37	5.88	10.25						
	L-O	2.96	3.12	6.08				0.06		11.56
	M-S	0.92	0.17	1.09						

Component	Forest –Woodland Seral Stage [2]	Forest-Woodland			Riparian		Grasslands	Roads	Open Water	Total
		Montane Mixed Conifer Forest	Southwest Oregon Mixed Conifer-	Forest-Woodland Sub-Total	Forested Wetland	Non-Forested Wetland				
Uncleared Storage Areas [3]	C-R	3.23	1.10	4.33						
	Tot	7.11	4.39	11.5						
Total Construction Disturbance	L-O	9.27	37.92	47.19	0.26		0.91	3.02	0.07	92.23
	M-S	3.7	5.21	8.91						
	C-R	21.39	10.48	31.87						
	Tot	34.35	53.61	87.96						
OPERATION DISTURBANCE										
Pipeline Facilities										
30-foot Maintenance Corridor	L-O	1.84	9.91	11.75	0.1		0.26	0.28	0.02	22.02
	M-S	0.84	1.24	2.08						
	C-R	4.73	2.81	7.54						
	Tot	7.4	13.96	21.36						
Total Operation Disturbance	L-O	1.84	9.91	11.75	0.1		0.26	0.28	0.02	22.02
	M-S	0.84	1.24	2.08						
	C-R	4.73	2.81	7.54						
	Tot	7.4	13.96	21.36						

[1] Acres disturbed were evaluated using GIS; footprints for each component (temporary construction right-of-way, temporary extra work areas, temporary access roads, uncleared storage areas, pipe storage yards, aboveground facilities, permanent easement, and 30-foot maintenance corridor) were overlaid on the digitized vegetation coverage.

[2] Forest-Woodland Seral Stages are L-O, Late Succession/Old Growth assumed to be ≥80 years old; M-S, Mid-Seral assumed to be ≥40 but ≤80 years old; C-R, Clearcut-Regenerating Forest assumed to be ≤40 years old.

[3] Small brush or trees may be cleared by a rubber-tired rotary or flail motor (brush hog) or by hand with machetes/chainsaws. No soil disturbance will occur. A rubber-tired or track hoe will be utilized to lay the discharge line and to remove the saturated haybales or filter bags upon completion of hydrostatic discharge.

4.1 Northern Spotted Owl

The NSO was selected as a MIS for mature and old growth habitat in the 1990 Fremont-Winema National Forest Plan (Forest Service, 1990e). The NSO was proposed for listing under the Endangered Species Act (ESA) when the Fremont-Winema National Forest's Plan was signed in 1990, and was officially listed as Threatened in 1992. The Northwest Forest Plan (BLM and Forest Service, 1994) amended Fremont-Winema's Forest Plan (Forest Service, 1990e), and was designed to ensure the population viability of the NSO. Since the NSO is now listed under the Endangered Species Act, it is covered extensively under separate cover in the Biological Assessment prepared for the Proposed Action. A summary of the status of NSOs and their habitat on Fremont-Winema National Forest is included here, including effects to NSO habitat from the Pipeline. Additional information can be reviewed in the Biological Assessment.

Fremont-Winema National Forest occurs within the East Cascades physiographic province. To assess the current condition of NSO habitat in the Fremont-Winema National Forest, a new

dataset was used to determine NSO habitat. In 2016, the improved 2012 GNN dataset was used to assess suitable NRF habitat for spotted owls within the NWFP area (see Davis et al. 2016 and https://www.fs.fed.us/r6/reo/monitoring/data/). This model applied to the Fremont-Winema National Forest predicts that there is approximately 85,150 acres of suitable NSO NRF habitat available. Through surveys for spotted owls that have occurred in the Fremont-Winema National Forest since 1990, with the majority of recent survey efforts through demographic studies, there are approximately 51 NSO pairs and/or resident singles that have been documented to occur or are occurring in the Fremont-Winema National Forest (Fremont-Winema Forest, 2006 GIS data layer); approximately 38 NSOs are monitored annually through NSO demographic studies on Fremont-Winema National Forest.

The Proposed Action affects NSO habitat (high NRF, NRF, dispersal only, and capable habitat as defined by FWS in the Conservation Framework developed for the Proposed Action; see FWS, 2014) on Fremont-Winema National Forest within the East Cascades physiographic province. Approximately 75 percent of NSO habitat affected from the Proposed Action on Fremont-Winema National Forest occurs within NSO home ranges (Table 4-2). Three known NSO home ranges with a radius of 1.2 miles occur within the Pipeline project area and will have NSO habitat affected, including habitat from one NSO core area and nest patch. Table 4-2, below identifies the amount of NSO habitat removed by the Proposed Action in Fremont-Winema National Forest. Overall, the Pipeline would remove approximately 41.10 acres of NRF habitat (high NRF and NRF, combined), which is approximately 0.05 percent of the 85,150 acres of NRF habitat available within Fremont-Winema National Forest.

Table 4-2
Summary of NSO Habitat Removed (acres) within Fremont-Winema National Forest

NSO Habitat	Location	Construction Right-of-Way	Temporary Extra Work Space	Total Habitat Removed
High NRF	Within Home Range	3.46	0.27	3.72
	Outside Home Range	1.26	0.45	1.71
	High NRF Total	4.72	0.71	5.43
NRF	Within Home Range	22.16	2.38	24.54
	Outside Home Range	9.57	1.57	11.13
	NRF Total	31.73	3.95	35.67
Dispersal Only	Within Home Range	2.49	0.29	2.78
	Outside Home Range	3.94	1.10	5.04
	Dispersal Only Total	6.42	1.40	7.82
Capable	Within Home Range	23.06	4.16	27.22
	Outside Home Range	0.29	0.02	0.32
	Capable Total	23.35	4.19	27.54
Total NSO Habitat	Within Home Range	52.76	8.10	60.86
	Outside Home Range	15.86	3.94	19.80
	Overall NSO Habitat	68.62	12.04	80.66

4.2 Pileated Woodpecker

The pileated woodpecker is an indicator species for the Winema National Forest for old-growth and mature mixed conifer habitats. The Proposed Action will not affect any of Fremont-Winema National Forest management areas designated for pileated woodpeckers. The following Standards and Guidelines and Management Prescriptions were identified in the Forest Plan to conserve and manage for pileated woodpeckers and their habitat:

Management Area 7 (Forest Service, 1990e):

- Provide suitable mature and old-growth nesting and foraging habitat for at least 28 pairs of pileated woodpeckers.
- Habitat areas should be a minimum of 300 acres of old-growth and/or mature mixed conifer, ponderosa pine and associated species as breeding and primary foraging habitat for one pair of pileated woodpeckers; large aspen or cottonwood trees in riparian areas can also be considered. Habitat areas shall be dispersed throughout suitable habitat not more than 5 miles apart from center of one area to the center of another area.
- Habitat should be contiguous, otherwise shall be at least 50 acres in size and not more than 0.25 mile apart.
- Within each 300-acre primary breeding area, a minimum average of two hard snags per acre greater than 12 inches DBH, including: 42 suitable nesting snags (hard) greater than 20 inches DBH within 300-acre breeding area, and 558 hard snags greater than 12 inches DBH.
- Disturbing human activities within 0.25 mile of an active pileated woodpecker nest site shall be discouraged or minimized from Macy 1 through July 31.

Habitat. Pileated woodpeckers occur within late-seral stages of the subalpine, montane, lower montane forests including: grand fir-white-fir, interior Douglas-fir, western larch, western white pine, western redcedar-western hemlock, Engelmann spruce-subalpine fir, and Pacific silver fir-mountain hemlock. Special habitat features are snags, down logs, and large hollow trees (Wisdom et al. 2000).

Pileated woodpeckers are generally associated with Montane Mixed Conifer Forest and Southwest Oregon Mixed Conifer-Hardwood Forests (Johnson and O'Neil, 2001) that coincide with the Pipeline (Table 4-1). Since they are dependent on downed wood and snags, pileated woodpeckers would be most likely to inhabit the old growth or late successional stands (≥80 years old) of those forests included in Table 4-1. However research suggests that only a small portion of the landscape in the Southwest Oregon Mixed Conifer-Hardwood Forest, late-seral stands are likely capable of providing nesting and roosting habitat for pileated woodpecker based on snag densities on unharvested plots (see Mellen-McLean et al., 2009).

Species' Status in the Pipeline Project Area. The Fremont-Winema National Forest occurs within both BCR 5 and BCR 9. In BCR 5, the past 20-year trend indicates relatively stable population with no significant trend in the vicinity (50 miles) of the Proposed Action and Fremont-Winema National Forest (see Section 2.2 and Figure 2-1). Pileated woodpeckers have also been documented in BCR 9; however, there are too few BBS routes where the species was observed and not enough data to determine a trend for this species in BCR 9 for the past 20 years.

This species has not been documented within or within the vicinity of the proposed Pipeline on Fremont-Winema National Forest per queries from existing, available GIS databases.

Effects of the Proposed Pipeline. Pileated woodpeckers could be negatively impacted during construction through the same direct and indirect effects that were discussed in Section 1.1 above, for the Umpqua National Forest. Clearing the right-of-way will modify habitat, changing the seral stage and tree species makeup of occupied forests. Construction will remove 6.31 acres of late successional-old growth Montane Mixed Conifer Forest and 34.8 acres of late successional-old growth Southwest Oregon Mixed Conifer-Hardwood Forests (Table 4-1). Also, 6.08 acres of late successional-old growth will be affected within UCSAs, an expected short-term disturbance. Additional potential long-term effects to pileated woodpeckers will be removal of 7.82 acres of mid-seral conifer-hardwood forest (≥40 years but ≤80 years old), thereby setting

back seral development that would be expected to eventually provide suitable habitat elements for pileated woodpeckers, including downed wood and snags. No habitat within Management Area 7 would be affected.

The amount of late successional-old growth habitat that would be removed by the Proposed Action is not expected to have an impact on the local or regional population of pileated woodpeckers which have mean home ranges of 478 hectares or 1,180 acres in western Oregon (Mellen, 1987; Mellen et al., 1992). If all of the impacted late successional-old growth (40 acres) occurred within a bird's or pair's home range, less than 3 percent of one home range would be affected. More likely, the Proposed Action would span several home ranges and the overall effect to any single bird or pair would be less than 3 percent removal.

If pileated woodpecker home ranges are assumed to be circular, the diameter of a 1,180-acre home range would be 8,090 feet. Blasting at one edge of that home range would attenuate to 30 dBA at the far edge of the home range and would attenuate to ambient noise (assumed to be 40 dBA) 4,630 feet away or a distance equal to 57 percent the diameter of a home range. Noise due to construction would be a short term effect to pileated woodpeckers and would be expected to affect them within only a portion of their home ranges.

Mitigation. Mitigation measures that would minimize impacts to pileated woodpeckers include planting trees within the right-of-way after construction. Conifers would be planted to within 15 feet of each side of the centerline. After tree planting, there will be 21.36 acres of former forest (11.75 acres of late successional-old growth, 2.08 acres of mid-seral forest, and 7.54 acres of clear cut-regenerating forest) that will remain in an herbaceous and/or shrub state within the 30-foot maintenance corridor during the life of the Pipeline (Table 4-1).

Timber removal and construction of the Proposed Action could occur during the breeding season of pileated woodpeckers (March 1 through July 31) and disturb nesting pileated woodpeckers if located within 0.25 mile of the Proposed Action. However, disturbance would be minimized in at least 0.3 mile of the Proposed Action on Fremont-Winema National Forest where an NSO activity center occurs within 0.25 mile of the Proposed Action and construction activities would not occur during the NSO critical breeding period (March 1 through July 15). In this same area of NSO presence, timber felling would occur outside of the entire NSO breeding season (after September 30 but before March 1); outside of this area, PCGP would fell trees before April 1 and after July 15, outside of the migratory bird primary nesting season. Felling trees during these time periods will avoid directly impacting young birds during the nesting season. Noise from blasting, if it is required during construction, will be minimized through application of various measures. Mitigation measures commonly applied to blasting of this type include drilling small (2.5-inch) charge holes, stemming the blast holes with sand and placing inert material on top of the blast area (Michael Minor & Associates, 2008).

To mitigate for loss of cavities and snags within the construction right-of-way, PCGP will create snags in large trees strategically left on the edge of the construction right-of-way by topping and or girdling trees. In addition, PCGP had previously agreed to fund other projects proposed by the Forest Service in the Fremont-Winema National Forest that included decommissioning 21.4 to 29.21 miles of roads, and stand density and fuel treatments of 113 acres to accelerate development of late successional and old growth habitat characteristic among other objectives. The Forest Service will be reviewing these projects to verify their relevance to the current proposed Pipeline. Implementation of these or similar projects would provide benefits to pileated woodpeckers within the Fremont-Winema National Forest. Proposed projects will be included in the CMP. During construction, potential impact to nesting pileated woodpeckers and other

species by predatory corvids will be addressed by assuring that all contractors practice appropriate trash containment and removal.

PCGP has also prepared a Migratory Bird Conservation Plan that identifies additional measures that would benefit pileated woodpeckers.

Forest Plan Consistency. The Proposed Action will not affect any of Fremont-Winema National Forest's management areas designated for the species. No further analyses or discussion is warranted (Forest Service, 1990e).

4.3 Northern Goshawk

The northern goshawk is the largest North American accipiter and was chosen as a management indicator species due to its association with mature and late and old-growth ponderosa and mixed conifer forest structural stages for nesting. The Proposed Action will not affect any of Fremont-Winema National Forest management areas designated for the northern goshawk. The following Standards and Guidelines and Management Prescriptions were identified in the Forest Plan to conserve and manage for northern goshawks and their habitat:

Management Area 7 (Forest Service, 1990e):

- Provide suitable mature and old-growth nesting and foraging habitat for at least 87 pairs of northern goshawks.
- A minimum of 60 acres of contiguous old-growth and/or mature mixed conifer, ponderosa pine and associated species, ponderosa pine, and lodgepole pine communities shall be provided as primary breeding and foraging habitat for one pair of northern goshawks.
- Habitat areas shall be dispersed throughout suitable habitat, not more than 5 miles apart from the center of one area to the center of another area.
- Disturbing human activities within 0.25 mile of any active northern goshawk nest shall be discouraged or minimized from March 1 through August 31.

Habitat. The northern goshawk's home range encompasses about 6,000 acres and is composed of a nest core area, post-fledging area (PFA), and a foraging area. Various forest structural stages are associated with the components of the home range. Nest areas often occur on north aspects, along stream zones or other areas where a dense forest canopy and late successional / old-growth forest conditions are present. Preferred nest stands have a minimum of 40 percent canopy closure; and the nest sites within these stands have greater than 60 percent canopy closure (Reynolds et al., 1991). Goshawks often use stands of old growth forest as nesting sites (DuBois et al., 1987). PFAs usually resemble the nest area, but also include a variety of forest types and conditions where hiding cover (for the young) and prey availability is present (Reynolds et al., 1991). Foraging areas may be as closely tied to prey availability as to habitat structure and composition. These areas often contain a mixture of various forest structural stages with snags, downed logs, large trees, and small openings with an herbaceous and/or shrubby understory present.

Northern goshawks are generally associated with Montane Mixed Conifer Forest and Southwest Oregon Mixed Conifer-Hardwood Forests (Johnson and O'Neil, 2001) that coincide with the Pipeline (Table 4-1). They are dependent on old growth or late successional stands (≥80 years old) of those forests included in Table 4-1. Goshawks are closely associated with Ponderosa Pine Forest and Woodlands (Johnson and O'Neil, 2001), which would not be affected by the Proposed Action.

Species' Status in the Pipeline Project Area. Northern goshawks have been documented at nine locations within approximately 3.5 miles (diameter of a home range) of the Proposed Action, including two locations within 0.5 mile (Forest Service, 2006 GIS data). A breeding site was also documented in 1992 north of the Pipeline in Fremont-Winema National Forest approximately 1.5 miles away (ORBIC, 2017). BBS routes in the vicinity of the Fremont-Winema National Forest and the Proposed Action have not detected goshawks during survey efforts.

Effects of the Proposed Pipeline. Northern goshawks could be negatively impacted during construction. Direct mortality of young could occur if nest trees are cleared prior to young fledging. Since nesting and roosting lasts from March 1 through August 31, tree felling during those periods could directly impact young birds. While adults would be able to escape temporary disturbances, adult birds could abandon nests, leaving eggs and chicks vulnerable to predation and the elements. However, tree felling before April 1 and after July 15 (outside of the migratory bird primary nesting season) and from October 1 to the end of February (after the breeding period for northern spotted owls) within 0.25 mile of one known NSO activity center on Fremont-Winema National Forest will likely avoid or minimize impact to nesting goshawks in that area, if present.

Clearing the right-of-way will modify habitat, changing the seral stage and tree species makeup of occupied forests. Construction will remove 6.31 acres of late successional-old growth Montane Mixed Conifer Forest and 34.80 acres of late successional-old growth Southwest Oregon Mixed Conifer-Hardwood Forests (Table 4-1). Also, 6.08 acres of late successional-old growth will be affected within UCSAs, an expected short-term disturbance. Additional potential long-term effects to northern goshawks will be removal of 7.82 acres of mid-seral conifer-hardwood forest (≥40 years but ≤80 years old), thereby setting back seral development that would be expected to eventually provide suitable habitat elements for northern goshawks. No habitat within Management Area 7 would be affected.

The amount of late successional-old growth habitat that would be removed is not expected to have an impact on the local or regional population of northern goshawks which have mean home ranges of 6,000 in western Oregon. If all of the impacted late successional-old growth (40 acres) occurred within a bird's or pair's home range, less than 0.1 percent of one home range would be affected. More likely, the Proposed Action would span several home ranges and the overall effect to any single bird or pair would be less than 0.1 percent removal.

If northern goshawk home ranges are assumed to be circular, the diameter of a 6,000-acre home range would be 3.5 miles (18,242 feet). Blasting at one edge of that home range would attenuate to 30 dBA at the far edge of the home range and would attenuate to ambient noise (assumed to be 40 dBA) 4,630 feet away or a distance equal to 25 percent the diameter of a home range. Noise due to construction would be a short term effect to northern goshawks and would be expected to affect them within only a portion of their home ranges, if nesting near the Proposed Action. Two nests have been documented (1992 and 1993; Forest Service, 2006 GIS data) approximately 0.5 mile from the Pipeline; if these sites are still present, it is not expected that noise associated with the Proposed Action would affect nesting goshawks.

Mitigation. Mitigation measures that would minimize impacts to northern goshawks include planting trees within the right-of-way after construction. Conifers would be planted to within 15 feet of each side of the centerline. After tree planting, there will be 21.36 acres of former forest (11.75 acres of late successional-old growth, 2.08 acres of mid-seral forest, and 7.54 acres of clear cut-regenerating forest) that will remain in an herbaceous and/or shrub state within the 30-foot maintenance corridor during the life of the Pipeline (Table 4-1).

Timber removal and construction of the Proposed Action could occur during the breeding season of northern goshawk (March 1 through August 31) and disturb nesting goshawks if located within 0.25 mile of the Proposed Action. However, disturbance would be minimized in at least 0.3 mile of the Proposed Action on Fremont-Winema National Forest where an NSO activity center occurs within 0.25 mile of the Proposed Action and construction activities would not occur during the NSO critical breeding period (March 1 through July 15). In this same area of NSO presence, timber felling would occur outside of the entire NSO breeding season (after September 30 but before March 1); outside of this area, PCGP would fell trees before April 1 and after July 15, outside of the migratory bird primary nesting season. Felling trees during these time periods will avoid directly impacting young birds during the nesting season. Noise from blasting, if it is required during construction, will be minimized through application of various measures. Mitigation measures commonly applied to blasting of this type include drilling small (2.5-inch) charge holes, stemming the blast holes with sand and placing inert material on top of the blast area (Michael Minor & Associates, 2008).

Previously, PCGP had agreed to fund projects proposed by the Forest Service in the Fremont-Winema National Forest that included decommissioning 21.4 to 29.21 miles of roads, and stand density and fuel treatments of 113 acres to accelerate development of late successional and old growth habitat characteristic among other objectives. The Forest Service will be reviewing these projects to verify their relevance to the current proposed Pipeline. Implementation of these or similar projects could provide benefits to northern goshawks within the Fremont-Winema National Forest. Proposed projects will be included in the CMP. During construction, potential impact to nesting goshawks and other species by predatory corvids will be addressed by assuring that all contractors practice appropriate trash containment and removal.

PCGP has also prepared a Migratory Bird Conservation Plan that identifies additional measures that would benefit northern goshawks.

Forest Plan Consistency. The Proposed Action will not affect any of Fremont-Winema National Forest's management areas designated for the species. No further analyses or discussion is warranted (Forest Service, 1990e).

4.4 Three-Toed Woodpecker or Black-backed Woodpecker

The three-toed woodpecker is an indicator species for the Fremont-Winema National Forest; however, the Fremont-Winema National Forest is considered to be outside of the range of three-toed woodpeckers. Therefore, the black-backed woodpecker has been substituted for three-toed woodpecker as an MIS species since they have similar habitat requirements. Black-backed woodpecker is an indicator of overmature and mature lodgepole pine forests.

The Proposed Action will not affect any of Fremont-Winema National Forest management areas designated for the three-toed woodpecker [black-backed woodpecker]. The following Standards and Guidelines and Management Prescriptions were identified in the Forest Plan to conserve and manage for three-toed woodpecker and their habitat and could be assumed to be similar for the black-backed woodpecker:

Management Area 7 (Forest Service, 1990e):

- Provide suitable mature and old-growth nesting and foraging habitat for at least 215 pairs of three-toed woodpeckers

- A minimum of 75 acres of contiguous old-growth and/or mature lodgepole pine or subalpine fir shall be provided as primary breeding and foraging habitat for one pair of three-toed woodpeckers
- Habitat area shall be dispersed throughout suitable habitat, not more than 25 miles apart from the center of one area to the center of another area
- Within 75-acre primary breeding area, a minimum average of 2 hard snags per acre greater than 10 inches DBH shall be maintained including 45 suitable nesting snags (hard) greater than 12 inches DBH and 105 hard snags greater than 10 inches DBH.
- Disturbing human activities within 0.25 mile of an active three-toed woodpecker nest site shall be discouraged or minimized from April 15 through July 15 [black-backed woodpeckers nesting range from April 1 through August 15; Adamus et al., 2001].

Habitat. Black-backed woodpeckers occur in conifer forest with snags, especially recently burned or bark-beetle killed forests. They nest in live trees with heart rot or dead trees, and can use smaller trees for nest cavities. Their main diet is larvae of wood-boring beetles gathered from under bark of trees.

Black-backed woodpeckers are generally associated with Montane Mixed Conifer Forest and Southwest Oregon Mixed Conifer-Hardwood Forests (Johnson and O'Neil, 2001) that coincide with the Proposed Action (Table 4-1). They are dependent on old growth or late successional stands (≥80 years old) of those forests included in Table 4-1.

Species' Status in the Pipeline Project Area. In Oregon, black-backed woodpeckers occur at high elevations of the west Cascades, is more widespread on the east slope of the Cascades with its center of abundance lodgepole pine forests from Bend to Klamath Falls, is uncommon in the Blue Mountains, and occasionally seen in the Siskiyou Mountains (Marshall et al., 2003). The closest documentation of black-backed woodpecker is greater than 8 miles southwest of the Proposed Action.

Data have been collected on 17 BBS routes in BCR 5 and 16 BBS routes in BCR 9 (Pardieck et al., 2017) that are within the region of the Fremont-Winema National Forest and the Proposed Action; no BBS routes occur on Fremont-Winema National Forest. No three-toed woodpeckers were included in any of the BBS observations on the compiled routes. No black-backed woodpeckers were reported in BBS routes compiled in BCR 5; however, six BBS routes compiled for BCR 9 have documented black-backed woodpeckers in the past 20 years, including one route located in the Forest. During the 20-year period 1997-2016, an average of 3.75 black-backed woodpeckers was reported on 4.35 routes reporting each year for an average of 0.84 birds per BBS route per year in BCR 9.. However, there is insufficient data to estimate 20-year population trends for this species within the region of the Proposed Action on Fremont-Winema National Forest.

Effects of the Proposed Pipeline. Black-backed woodpeckers could be negatively impacted during construction through the same direct and indirect effects that were discussed in Section 1.1 above, for the Umpqua National Forest. Clearing the right-of-way will modify habitat, changing the seral stage and tree species makeup of occupied forests. Construction will remove 6.31 acres of late successional-old growth Montane Mixed Conifer Forest and 34.80 acres of late successional-old growth Southwest Oregon Mixed Conifer-Hardwood Forests (Table 4-1). Also, 6.08 acres of late successional-old growth will be affected within UCSAs, an expected short-term disturbance. Additional potential long-term effects to black-backed woodpeckers will be removal of 7.82 acres of mid-seral conifer-hardwood forest (≥40 years but ≤80 years old), thereby setting back seral development that would be expected to eventually provide suitable habitat elements

for black-backed woodpeckers, including downed wood and snags. No habitat within Management Area 7 identified for three-toed woodpeckers [black-backed woodpeckers] would be affected.

The amount of late successional-old growth habitat that would be removed is not expected to have an impact on the local or regional population of black-backed woodpeckers which have an average home range of 550 hectares or 1,360 acres (Johnson and O'Neil, 2001). If all of the impacted late successional-old growth (40 acres) occurred within a bird's or pair's home range, less than 3 percent of one home range would be affected. More likely, the Proposed Action would span several home ranges and the overall effect to any single bird or pair would be less than 3 percent removal.

If black-backed woodpecker home ranges are assumed to be circular, the diameter of a 1,360-acre home range would be 8,685 feet. Blasting at one edge of that home range would attenuate to 30 dBA at the far edge of the home range and would attenuate to ambient noise (assumed to be 40 dBA) 4,630 feet away or a distance equal approximately half (53 percent) the diameter of a home range. Noise due to construction would be a short term effect to black-backed woodpeckers and would be expected to affect them within only a portion of their home ranges.

Mitigation. Mitigation measures that would minimize impacts to black-backed woodpeckers include planting trees within the right-of-way after construction. Conifers would be planted to within 15 feet of each side of the centerline. After tree planting, there will be 21.36 acres of former forest (11.75 acres of late successional-old growth, 2.08 acres of mid-seral forest, and 7.54 acres of clear cut-regenerating forest) that will remain in an herbaceous and/or shrub state within the 30-foot maintenance corridor during the life of the Pipeline (Table 4-1).

Timber removal and construction of the Proposed Action could occur during the breeding season of black-backed woodpeckers (April 1 through August 15; Adamus et al., 2001) and disturb nesting black-backed woodpeckers if located within 0.25 mile of the Proposed Action. However, disturbance would be minimized in at least 0.3 mile of the Proposed Action on Fremont-Winema National Forest where an NSO activity center occurs within 0.25 mile of the Proposed Action and construction activities would not occur during the NSO critical breeding period (March 1 through July 15). In this same area of NSO presence, timber harvest would occur outside of the entire NSO breeding season (after September 30 but before March 1); outside of this area, timber felling ill occur before April 1 and after July 15, outside of the migratory bird primary nesting season. Felling trees during this time period will minimize or avoid directly impacting young birds during the nesting season. Noise from blasting, if it is required during construction, will be minimized through application of various measures. Mitigation measures commonly applied to blasting of this type include drilling small (2.5-inch) charge holes, stemming the blast holes with sand and placing inert material on top of the blast area (Michael Minor & Associates, 2008).

To mitigate for loss of cavities and snags within the construction right-of-way, PCGP will create snags in large trees strategically left on the edge of the construction right-of-way by topping and or girdling trees. Previously, PCGP had agreed to fund projects proposed by the Forest Service in the Fremont-Winema National Forest that include decommissioning 21.4 to 29.21 miles of roads, and stand density and fuel treatments of 113 acres to accelerate development of late successional and old growth habitat characteristic among other objectives. The Forest Service will be reviewing these projects to verify their relevance to the current proposed Pipeline. Implementation of these or similar projects would provide benefits to black-backed woodpeckers within the Fremont-Winema National Forest. Proposed projects will be included in the CMP. During construction, potential impact to nesting black-backed woodpeckers and other species by

predatory corvids will be addressed by assuring that all contractors practice appropriate trash containment and removal.

PCGP has also prepared a Migratory Bird Conservation Plan that identifies additional measures that would benefit black-backed woodpeckers.

Forest Plan Consistency. The Proposed Action will not affect any of Fremont-Winema National Forest's management areas designated for three-toed woodpeckers [black-backed woodpeckers]. No further analyses or discussion is warranted (Forest Service, 1990e).

4.5 American (Pine) Marten

The pine marten was selected as an indicator species due to its close association with late successional mixed conifer and lodgepole pine forests (Forest Service, 1990f). Pine martens represent those species utilizing mature conifer forests which need mature habitat areas spaced closer than 5 to 6 miles apart. They are not generally found below 4,000 feet in the forest and do not appear to have an upper elevation restriction, which makes it an especially important indicator for those species capable of utilizing high elevation habitat or that are less mobile than either the spotted owl or pileated woodpecker (Forest Service, 1990f).

The following Standards and Guidelines and Management Prescriptions were identified in the Forest Plan to conserve and manage for pine martens and their habitat:

Management Prescriptions. The monitoring objective for the pine marten is to assure that habitat that will meet or exceed the Forest share of that needed to meet viable populations of pine marten is provided and maintained. This applies to all management areas through which the Pipeline will pass, which includes 3A, 3B, and 3C (Forest Service, 1990e).

MA3A emphasizes the retention of natural-appearing foreground areas.

- Lands: For lands visible for up to 0.25 miles from selected travelways, waterbodies, or public use areas, only forms, lines, colors, and textures found in the characteristic landscape will be allowed. Natural appearing forms, colors, and textures dominate.
- Vegetation may be manipulated through enhancing large diameter trees, scattering large trees among other size classes, or creating small openings with natural appearing edges. Trees with distinctive bark and tree form characteristics, including occasional snags, are very evident. Large tree character should be maintained in the foreground retention area in all species except lodgepole pines, and should be distributed in groupings.
- Project evidence such as slash should not be noticeable one year after work completion.
- Fire suppression methods in the immediate foreground should use low-impact methods (Forest Service, 1990e).

MA3B emphasizes attractive scenery slightly altered from a natural condition as viewed in the foreground.

- Activities may repeat or introduce form, line, color, or texture common or not to the characteristics landscape, but changes in size, amount, intensity, direction, and pattern must remain visually subordinate.
- Lands: For lands visible for up to 0.25 miles from selected travelways, waterbodies, or public use areas, only forms, lines, colors, and textures found in the characteristic landscape will be allowed. Details such as individual tree shape, color, size, species mix, and related vegetation are the focus.

- The desired future condition emphasizes and maintains perpetually large tree character, except lodgepole pine, through large-diameter trees in groupings or scattering individually large trees among other tree size classes. Small openings with natural-appearing edges may be created. Trees with distinctive bark and tree form characteristics, with occasional snags, are very evident. Management activities may be noticeable.
- Project evidence such as slash should not be noticeable two to three years after work completion, and large tree character should be retained in the foreground area. Hand tools are preferred for fire suppression in the immediate foreground (Forest Service, 1990e).

MA3C emphasizes attractive scenery slightly altered from a natural condition as viewed in the middleground.

- Activities may repeat or introduce form, line, color, or texture common or not to the characteristics landscape, but changes in size, amount, intensity, direction, and pattern must remain visually subordinate.
- Lands: For lands visible for 0.25 to 5 miles from selected travelways, waterbodies, or public use areas, textures or forms are the focus, with groups or stands of trees similar as a unit compared to others that differ in size, texture, or pattern. Continuous canopy is typical, with variety provided by natural openings, rimrock, or rock outcrops.
- The desired future condition calls for masses or vegetation as evident, with a mosaic created by varying canopy levels with natural-appearing edges and forested ridgelines.
- Activities may introduce changes in form, line, color, or texture that are found infrequently or not at all in the characteristic landscape, but must remain subordinate to the visual strength of the characteristic landscape (Forest Service, 1990e).

The monitoring questions and thresholds of concern are as follows:

- is habitat in reserved sites meeting the needs of the pine marten in regard to structure, function, and size as per assumptions; the threshold of concern for this question occurs when more than 10 percent of marten habitat sites have less than 95 percent suitable habitat.
- is the distribution of pine marten habitat meeting species needs, and are areas occupied by pine martens being isolated from genetic interchange by management activities.
- the threshold of concern for all three monitoring questions occurs when more than a 10 percent reduction in the distributional area of pine martens after five years of baseline information is developed (Forest Service, 1990e).

Species Status in the Pipeline Project Area. Past extensive logging and trapping for pelts led to extirpation in some areas of Oregon; however, martens have been re-introduced to Oregon. Due to the loss of mature forest habitat, pine marten populations may be declining in Oregon (Csuti et al., 2001). Pine marten populations in high-elevation habitats are probably stable, but loss of habitat due to human encroachment in low and mid-elevation areas has resulted in population declines and local extirpations (Johnson and O'Neil, 2001). No specific information for species presence is available for Fremont-Winema National Forest.

Habitat. The American marten is associated with forested habitats at any elevation, but will wander through openings and even up into alpine areas. American marten are typically associated with late-seral coniferous forests with closed canopies, large trees, and abundant snags and down wood (Zielinski et al., 2001), but they will use openings in forests if there are sufficient downed logs to provide cover. The type of forest is less important to martens than the forest structure, although they are not found in dry woodlands (Csuti et al., 2001). Wisdom et al.

(2000; Appendix 1, Table 1) list subalpine and montane forests in old multi- and single-story, and unmanaged young multi-story structural stages as providing source habitat for American marten in the Columbia Basin. Lower montane forests are not listed as source habitat (Wisdom et al., 2000). Snags and down logs are identified as special habitat features of source habitat for the marten (Appendix 1, Table 2) (Wisdom, 2000). Down logs provide habitat for prey and subnivean access points. Raphael and Jones (1997) found that down wood and slash piles were important resting and denning structures in the eastern Cascades of central Oregon. Large slash piles and trees with branches that reach to the ground are also important to provide access through the snow during the winter (Forest Service, 1990e).

In the Cascades, marten selected sites with higher canopy closure during snow periods than during snow-free periods (Raphael and Jones, 1997). In Oregon, canopy closure at rest sites in lodgepole pine dominated stands averaged 36% in snow periods and 27% in snow-free periods (Raphael and Jones, 1997). Slauson et al. (2007) also found that larger patch sizes of habitat were important for marten occurrence. Marten used patches over 100 ha (247 acres) at higher rates than availability (Slauson et al., 2007). At the 1-km radius scale, a 10% increase in the amount of logged area was associated with a 23% decrease in marten occurrence (Slauson et al., 2007). Martens were not detected at any sample unit with more than 50% of the area logged in the 1-km radius circle (Slauson et al., 2007).

Pine martens are primarily carnivorous (Csuti et al., 2001) and diet on a variety of mammalian species. They feed on rodents and opportunistically on other small mammals and birds. Winter food sources are critical to marten survival as they carry very little fat reserves on their bodies. (Forest Service, 1990e). Martens will forage underground, on the ground, and on shrub or understory vegetation (Johnson and O'Neil, 2001).

The dens of pine martens are located in trees or underground. They often have multiple dens which they move between during the rearing season (Forest Service, 1990e). Denning takes place in coarse woody debris, slash, snags, and live trees. Parturition takes place in March and April, and mating occurs in June through early August.

Pine martens are associated with the following habitat types that occur within the Fremont-Winema National Forest and which will be affected by construction: they are closely associated with Montane Mixed Confer Forest and occurrence is uncertain in Southwest Oregon Mixed Conifer-Hardwood Forest (Johnson and O'Neil, 2001). They may be present in Eastside Riparian Wetlands at high elevations (Johnson and O'Neil, 2001). Presence of pine martens would depend on appropriate structural conditions including snags, down logs, and rock outcrops (Johnson and O'Neil, 2001).

Forest Management Activities. Fire can negatively affect marten habitat by destroying ground and overhead cover and consuming dead and down material. Recreation activity within the Fremont-Winema National Forest was not considered to be heavy enough to influence this species now or in the foreseeable future, at the time of the Forest Plan completion. Trapping of these fur bearing animals over the last 20 years has been light and localized to small areas. Broad wildlife coordination guidelines which address leaving snags, down material, unit size, shape, and spatial distribution, apply to timber sales and result in the maintenance of habitat.

Effects of the Proposed Action. Within Montane Mixed Conifer Forest and Southwest Oregon Mixed Conifer-Hardwood Forest, pine martens may be present within suitable structural conditions including small tree, medium tree, large tree, and giant tree conditions, singly and multi-story and open moderate and closed canopies, but only if snags, down logs, and/or rock outcrops

are present for denning (Johnson and O'Neil, 2001). Removal of 27.24 acres of Montane Mixed Conifer Forest (6.31 acres of late successional-old growth forest, 2.78 acres of mid-seral forest, and 18.16 acres of clearcut-regenerating forest) and 49.22 acres of Southwest Oregon Mixed Conifer-Hardwood Forest (34.80 acres of late successional-old growth forest, 5.04 acres of mid-seral forest, and 9.38 acres of clearcut-regenerating forest) would affect less habitat than the equivalent of one-half of a female home range (160 acres – see discussion above under the Rogue River-Siskiyou National Forest). However, given the lack of association between pine martens and the forested types affected in the Fremont-Winema National Forest, effects to the species could occur but are not likely.

Mitigation. Mitigation measures that would minimize impacts to pine martens include planting trees within the right-of-way after construction. Conifers would be planted to within 15 feet of each side of the centerline. After tree planting, there will be 7.40 acres of former Montane Mixed Conifer and 13.96 acres of former Southwest Oregon Mixed Conifer-Hardwood Forest that will remain in an herbaceous state – the maintenance corridor - during the life of the Pipeline (Table 4-1).

To mitigate for loss of downed wood and snags within the construction right-of-way, PCGP had previously agreed to fund the Forest Service to treat approximately 113 acres by thinning forest and creating small openings adjacent to pipeline corridor along Clover Creek corridor and Dead Indian Road crossing. The projects would include fuel treatments. The treatments would accelerate the development of late successional habitat characteristics of structure. The Forest Service will be reviewing these projects to verify their relevance to the current proposed Pipeline. Implementation of these or similar projects would provide benefits to pine martens within the Fremont-Winema National Forest if they occur. Proposed projects will be included in the CMP.

Forest Plan Consistency. Implementation of the mitigation measures is expected to provide forest structure and function for pine martens in areas that would otherwise be subject to intensive timber harvest. In these respects, the Proposed Action would be consistent with the Forest Plan.

4.6 Bald Eagle

The bald eagle was chosen as a management indicator species for the Forest because it was classified as a threatened species under the ESA (Forest Service, 1990f). However, the species is no longer listed under the Act and was moved to the Region 6 Sensitive Species List as required by the USDA (see discussion under Section 2.7, above, Umpqua National Forest).

The following Standards and Guidelines and Management Prescriptions were identified in the Forest Plan to conserve and manage for bald eagles and their habitat:

Applicable Forest Plan Forest-wide Standards and Guidelines. The monitoring objective for the bald eagle is to assure that recovery plan objectives are being met (Forest Service, 1990e). The following are monitoring questions and thresholds of concern for the bald eagle:

- is the bald eagle population approaching recovery objectives? The threshold of concern for this question occurring when more than a 10 percent decline of the bald eagle population in the Klamath Basin.
- are all known and identified potential nest sites protected in accordance with the Recovery Plan and has a site plan for each next been written? The threshold of concern for this question occurs when any site is not protected, and/or when there are more than 10 percent of sites with unfinished site plans two years after implementation.

- For both of these first two questions, concern would occur when an active nest site is unoccupied two years in succession; if this happens, the causes must be determined and the situation corrected, if possible.
- Other monitoring questions include: are nest sites producing young; is the winter roost receiving use, with concern if the decrease of winter roost use is greater than 20 percent over the previous two years average; is management of bald eagle replacement habitat producing stand conditions that meet objectives for large trees, with concern if silviculturally treated replacement areas are not releasing or achieving growth rates as anticipated five years after implementation; and is replacement area habitat receiving use by the bald eagle, with concern if there is no use of the replacement area within ten years of implementation (Forest Service, 1990e).

Management Prescriptions. All management areas through which the Pipeline will pass are to be monitored for the bald eagle, which includes 3A, 3B, and 3C. See description for Pine Marten, above. The nesting and roosting season is January 1 through August 31, and the required protection zone is 440 yards (Forest Service, 1990e).

Species Status in the Pipeline Project Area. There are two bald eagle nests within the Fremont-Winema National Forest (Fish Lake 543 and Fish Lake 1227) in the vicinity of the Pipeline but each is farther than one mile away. One nest was recently used in 2006 and the other, an alternate nest site, was used in 2003. The National Audubon Society (2017) has conducted Christmas Bird Counts (CBC) annually within the Klamath Falls Count Circle through 2016. The Klamath Falls Count Circle is 1.6 miles from the Pipeline and 21.7 miles from where the Pipeline crosses the Fremont-Winema National Forest. Bald eagles have been observed each year within the Klamath Falls CBC and are reported as numbers counted per observational hour. Since 1992, the number of bald eagles counted per hour has significantly increased ($p<0.01$), shown in Figure 4-1 (National Audubon Society, 2017). Wintering bald eagles have likewise been significantly increasing along the Pacific and within the Great Basin (see Steenhof et al., 2008). A similar increase in wintering bald eagles is expected in the Fremont-Winema National Forest. Bald eagles are fairly common breeders at Upper Klamath Lake.

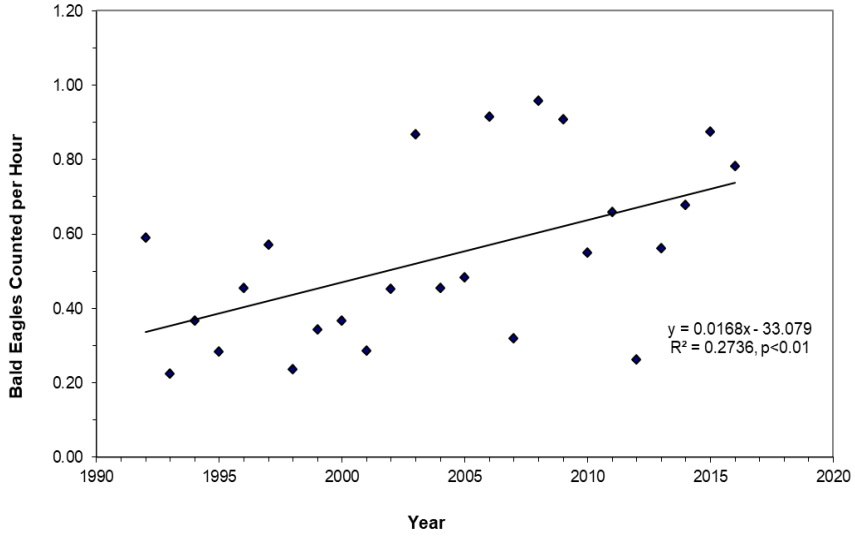

Figure 4-1
Bald Eagles Counted per Hour during National Audubon Society's Christmas Bird Count in the Klamath Falls Count Circle 1992- 2016 (data from National Audubon Society, 2017).

Habitat. The bald eagle is a year-round resident when food is available. Essential habitat elements of the bald eagle are nest sites, communal night roosts, foraging areas, and perch sites. Nests consist of bulky stick platforms built in the super-canopy of trees, or less frequently on cliffs. They are typically constructed within one mile of appropriate foraging habitat, which includes rivers and large (typically 90 surface acres or greater) lakes and reservoirs. All nests observed in Oregon have been in trees, primarily Sitka spruce and Douglas-fir west of the Cascades, and ponderosa pine, Douglas-fir, and sugar pine in eastern Oregon. Nests are usually built in live trees, but they will reuse the nest after the tree dies (Marshall, et al., 2006). Large snags, dead-topped trees, and live open-limbed trees within the nest stand is important for providing perch sites for the adults and landing sites for the fledglings. Bald eagles are sit-and-wait predators, which predominantly capture prey from perches over water; ideal perches are large trees and snags within 330 feet (100 meters) of water (Anthony et al., 1995). When they are not breeding, they may congregate where food is abundant, even away from water.

Bald eagles are associated most habitats within the Fremont-Winema National Forest in proximity to waterbodies, including Southwest Oregon Mixed Conifer-Hardwood Forest and Montane Mixed Conifer Forest.

Effects of the Proposed Action. Potential effects to bald eagles by the Proposed Action within the Fremont-Winema National Forest are expected to be the same as described above for effects in the Umpqua National Forest. Habitat destruction through logging, road construction, and recreational development has in the past had the most affect on this species throughout its range. Recent public awareness and concerns have reduced this kind of detriment, at least on public lands. Unintentional harassment or malicious destruction of nests and shooting eagles does occur, although it has not been a problem on this Forest. Public awareness has benefited this species. The current management for this species requires, as a minimum, preparing a site-specific management plan for each bald eagle site. Plans will be coordinated and reviewed with the FWS (Forest Service, 1990f). One bald eagle nest located in the Fremont-Winema National Forest is just beyond one mile from the Proposed Action. However, because the nesting pair is beyond 1 mile of the Pipeline, no effects to the nesting bald eagle pair is expected.

Mitigation. No mitigation specifically targeting impact to bald eagles is proposed in the Fremont-Winema National Forest.

Forest Plan Consistency. The Proposed Action will be consistent with Forest Plan Standards and Guidelines to meet the requirements of the Endangered Species Act of 1973, related to management of bald eagles.

4.7 Mule Deer

The mule deer is listed as an indicator species because of its economic importance (Forest Service, 1990e). Summer and winter range habitat are both important to the mule deer since their survival depends on the condition and presence of winter range, and on early successional vegetation stages or non-forest habitat for forage in summer range (Forest Service, 1990f). Deer summer range capability indices are useful indicators for species needing non-forested habitat for survival (Forest Service, 1990f).

The following Standards and Guidelines and Management Prescriptions were identified in the Forest Plan to conserve and manage for mule deer and their habitat:

Applicable Forest Plan Forest-wide Standards and Guidelines. Mule deer habitat is supposed to be managed, taking into account 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 will 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 some projects; for example, with timber sales, grazing plans, road construction and water development (Forest Service, 1990e).

The Forest is supposed to 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. All cover also will be hiding cover, whenever possible. A short-term 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. To provide adequate diversity of forage structure for deer, activities shall be planned to achieve multiple age classes in the brush vegetative component. Wildlife forage will be allocated to meet the needs of big game first, and then to meet the needs of other animals. (Forest Service, 1990e).

The monitoring objectives for the mule deer are to assure that habitat objectives are met, and to validate habitat assumptions. The monitoring questions and thresholds of concern are:

- what is the relationship between habitat and population, and what is the habitat variable that most limits the population of mule deer, with a decline exceeding 10 percent of 1990 populations of mule deer on any management unit influenced by the Forest being of concern, as well as a cumulative decrease of habitat suitability greater than 5 percent over five years and/or a cumulative decrease of habitat suitability index factors greater than 5 percent over five years being of concern.
- what are the cumulative effects of open roads, alterations in cover, alterations of forage, livestock competition, water developments, and cover/forage distribution on deer habitat suitability, and what is the primary cause of the decline of herds in the area, with the thresholds of concern the same as mentioned previously.
- what is the longevity of mule deer habitat structural and nonstructural improvements, with concern shown when the functional or structural failure rate of structural or nonstructural habitat improvements exceeding 10 percent over five years and/or failure to maintain 95 percent of structural improvements over five years, with minor maintenance expected and not considered a failure (Forest Service, 1990e).

Management Prescriptions. This affects all management areas through which the Pipeline will pass, which includes 3A, 3B, and 3C (Forest Service, 1990e). See management descriptions for Pine Marten, above.

Species Status in the Pipeline Project Area. Long-term, systematically collected data are available for this species, collected annually by the ODFW. Data are collected on population trends, sex ratios, winter mortality, and harvest. Within Fremont-Winema National Forest, seven ODFW Management Units occur: Fort Rock, Silver Lake, Sprague, Klamath Falls, Interstate, Rogue, and Keno. ODFW's Keno Hunt Management Unit 31 coincides with the portion of the Fremont-Winema National Forest within which the Proposed Action is located (MPs 168.85-175.38). ODFW (2018a) has compiled harvest data on mule deer within Wildlife Management Unit 31 through the 2016 season (ODFW, 2018a). Total mule deer harvest appears to be cyclic and has increased within the WMU from 2003 through 2007 and again from 2008 through 2011 and 2012 through 2016. During the same period of time, the same cyclic pattern has been

observed where percent hunter success has increased through 2014 and the number of days per mule deer harvested has decreased through 2016, although no significant trends were observed (Table 4-3).

Table 4-3
Harvest Statistics for Mule Deer within the Keno Wildlife Management Unit 31, 2003-2016

Year	Total Hunters	Total Hunter Days	Harvest			Days per Harvest	Percent Hunter Success
			Total Males (antlered)	Total Non-Males (non-antlered)	Total		
2016	1504	not reported	443	1	444	not available	30
2015	1446	not reported	396	1	397	not available	27
2014	1340	8177	426	1	427	19	32
2013	1366	8296	489	0	489	17	36
2012	1205	7329	372	0	372	20	31
2011	1153	7095	495	0	495	14	43
2010	1181	7861	259	0	259	30	22
2009	1139	7138	270	0	270	26	24
2008	1007	6468	218	0	218	30	22
2007	1241	7951	472	0	472	17	38
2006	1146	6216	373	0	373	17	33
2005	1208	7528	366	0	366	21	30
2004	1101	7432	292	0	292	25	27
2003	1185	6343	223	0	223	28	19

Harvest data for Keno WMU 31 suggests that the mule deer population could be cyclic and as it increases, hunter success increases with decreased levels of effort. Annual reports for each WMU provided by ODFW include 1) a population index - ODFW's Trend Count for animals in the WMU (ODFW, 2018b), conducted along a fixed route each year, usually at the end of winter, 2) productivity (young per female from ODFW's Composition Count data reported in December), and 3) an estimate of the maximum overwinter juvenile survival rate (derived from composition count data in December and composition count data the following March). There is no significant trend in fawns per doe (young per adult female) nor is there any significant trend in ODFW's Trend Count in Table 4-4. Estimated young overwinter survival relative to adult overwinter survival indicates that juvenile mule deer in the Keno Wildlife Management Unit 30 have had moderate to high overwinter survival rates relative to adult deer since estimates ranged from 0.52 to 1.44 (Table 4-4).

Table 4-4
Population Trends, Annual Productivity, and Estimated Overwinter Survival for Juvenile Mule Deer within the Keno Wildlife Management Unit 31, 1998-2012

Year	Population Index [1]	Young per Adult Female [2]	Young per Adult – Fall (Ratio A) [3]	Young per Adult – Spring (Ratio B) [4]	Maximum Overwinter Juvenile Survival Rate [5]
2012	5.1	0.69	0.58	0.33	0.65
2011	-	0.64	0.51	-	-
2010	1.5	0.68	0.60	0.41	0.74
2009	4.1	0.66	0.56	0.53	1.44

2008	5.6	0.42	0.37	-	-
2007	6.0	0.63	0.53	0.38	0.80
2006	-	0.58	0.48	0.30	0.54
2005	2.0	0.64	0.55	0.50	0.98
2004	5.0	0.60	0.51	0.33	0.92
2003	5.5	0.48	0.36	0.32	0.52
2002	5.6	0.75	0.61	0.35	-
2001	5.6	-	-	0.33	0.76
2000	4.9	0.53	0.44	0.33	0.63
1999	3.9	0.61	0.53	0.50	0.90
1998	3.7	0.63	0.56	0.47	-

[1] **Population Index** is ODFW's Trend Count for the Hunt Area which is conducted along a fixed route each year, usually at the end of winter (ODFW, 2018b).
[2] **Productivity** data is young per female from ODFW's Composition Count data reported as Young per 100 Females counted in December (ODFW, 2018b).
[3] **Ratio A** (White et al., 1996) is the ratio of Young per Adult, derived from Composition Count data (Males per 100 Females and Young per 100 Females) counted in December (ODFW, 2018b).
[4] **Ratio B** (White et al., 1996) is the ratio of Young per Adult (Young per 100 Adults) counted in March (ODFW, 2018b).
[5] **Maximum Overwinter Juvenile Survival** is related to ratios ***A*** and ***B*** and to the following relationship of adult over-winter survival rate ($\hat{S}_a$) and juvenile over-winter survival rate ($\hat{S}_j$) by the formula (see equation 9 in Paulik and Robson, 1969): $\hat{S}_j / \hat{S}_a = \boldsymbol{B}/\boldsymbol{A}$ or $\hat{S}_j = \hat{S}_a$ ($\boldsymbol{B}/\boldsymbol{A}$). Since many of the estimates of maximum juvenile survival rates are greater than 1, they indicate survival of adults was less than juveniles over winter which is highly unlikely.

Although population data for mule deer in Wildlife Management Unit 31 are limited, the number of fawns per doe appears to have been declining since 2002 although the trend is not significant (Figure 4-2).

Habitat. Optimal mule deer habitat is generally described as a mix of hiding, thermal, and fawning cover, and foraging habitat. They are found throughout Oregon, east of Cascades and ranges into Cascades in summer. They spend summer at higher elevations and move back to lower elevations during winter though not all populations exhibit marked movements (Johnson, and O'Neil, 2001). Mule deer in central Oregon are a migratory group of animals that roam a vast mountainous summer range and crowd into relatively small winter ranges (Dealy, 1971). Currently, they are confined mainly to open woods or isolated mountain ranges (Csuti et al., 2001).

Mule deer are browsers and grazers. Bitterbrush is an important component of summer range habitat; Gay (1998) found that bitterbrush along with other non-sprouting shrubs dominate summer deer diets in pumice influenced zones. Bitterbrush is a very valuable browse species for the diets of mule deer because the twigs and leaves contain high levels of protein (Clark and Britton, unk.). Grasses and forbs compose the bulk of spring diets.

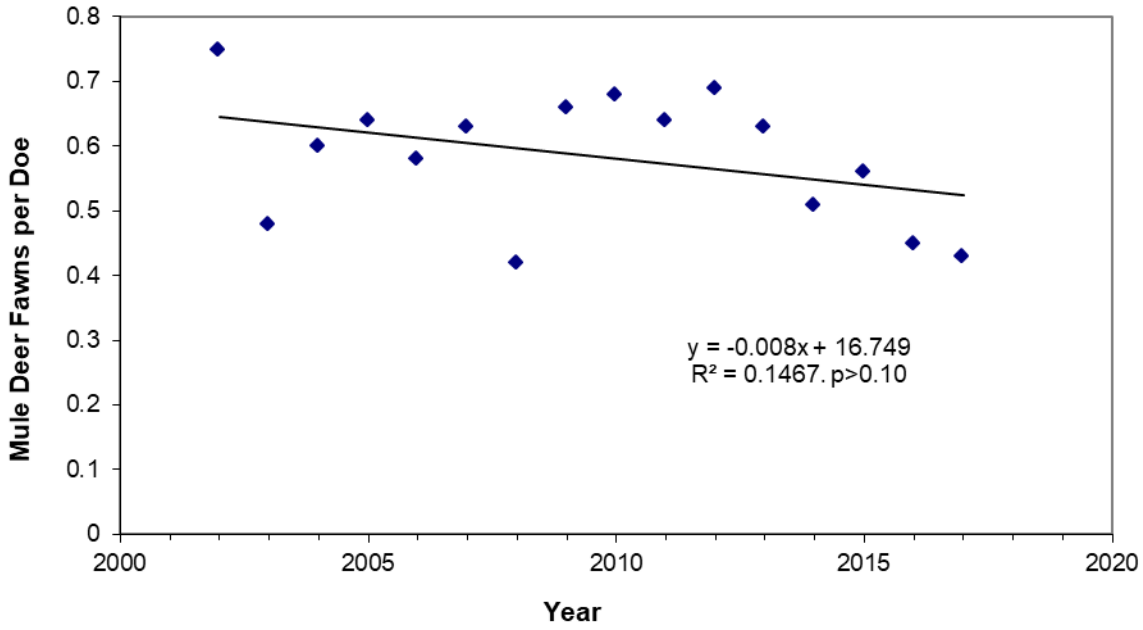

Figure 4-2
Trend in Productivity (Fawns per Doe) for Mule Deer in the Keno Wildlife Management Unit 31 which Coincides with the Pipeline in the Fremont-Winema National Forest (data from ODFW, 2018b)

Summer thermal cover minimizes metabolic and time costs associated with heat dissipation (Demarchi and Bunnel, 1993). Thermal cover can be provided by shrubs, juniper woodlands, or physical objects such as boulders and ledges (Peek et al., 1999). Hiding cover habitat is used for escape and protection from predators and humans (Peek et al., 1999). Optimal hiding cover is defined as that which is within 600 feet (183m) of cover (cover being defined as a stand that is at least 60 percent cover), and can hide 90 percent of a deer at 200 feet, which omits less dense vegetation types that deer also recognize as cover (Gay, 1998).

Mule deer are generally associated with most of the habitats crossed by the Proposed Action within Fremont-Winema National Forest including Montane Mixed Conifer Forest, Southwest Oregon Mixed Conifer-Hardwood Forest, Eastside (Interior) Riparian-Wetlands where structural conditions provide for cover, and Eastside (Interior) Grasslands generally used for feeding (Johnson, and O'Neil, 2001). No mule deer wintering ranges would be crossed within the Fremont-Winema National Forest.

Effects of the Proposed Action. Effects to mule deer in the Fremont-Winema National Forest are expected to be similar to effects to Columbian black-tailed deer described above for the Umpqua National Forest. Direct mortality of mule deer due to the Proposed Action is possible if vehicles collide with animals traveling to and from construction sites (see discussion under Umpqua National Forest, Section 1.5, above). Mule deer would be expected to avoid noise from vehicles and/or increased road traffic, blasting, and aerial fly-overs. Following reclamation of the pipeline corridor, mule deer may utilize the corridor for travel and for foraging, depending on vegetation species planted and rapidity of successful revegetation. After construction, there will possibly be a secondary impact (Comer, 1982) on harvest rates with upgraded access to previously inaccessible areas; hunters are expected to achieve greater success, at least temporarily, with increased access. In addition, increased access could increase poaching of game animals and

nongame wildlife on a local level (see discussions under Umpqua National Forest, Section 1.5, above). The Proposed Action will remove 76.46 acres of Montane Mixed Conifer Forest and Southwest Oregon Mixed Conifer-Hardwood Forest, 0.26 acres of Forested Wetlands, and 0.91 acre of Eastside Grasslands (Table 4-1).

Mitigation. The pipeline right-of-way provides an opportunity for developing high quality feeding areas (Lees, 1989) for deer species, especially if noxious weeds are controlled and high quality native forage is seeded. As required by FERC's Upland Plan, PCGP consulted with the NRCS, the BLM, and the Forest Service regarding specific seeding dates and recommended seed mixtures for the Pipeline project, including important winter forage species, such as wedgeleaf ceanothus, in riparian areas and areas outside of the 30-foot maintenance corridor on National Forest lands. The ECRP describes the procedures that will be implemented to minimize erosion and enhance revegetation success, the procedures that will be utilized to minimize the spread of noxious weeds as a result of construction, and the silvicultural prescriptions that will be implemented in areas that are outside the permanent easement. Seeding mixtures and inhibition of noxious weeds will enhance forage production.

Vegetation management over the long-term will benefit winter range browse and forage for mule deer. Vegetation within the 30-foot maintenance corridor will be periodically maintained by mowing, cutting, and trimming (either by mechanical or hand methods). In upland areas, the 30-foot maintenance corridor will be maintained in a condition where trees or shrubs greater than 6 feet tall will be controlled (cut or trimmed) within 15 feet either side of the centerline (for a total of 30 cleared feet). Maintenance activities are expected to occur approximately every 3-5 years depending on the growth rate of vegetation. During maintenance, vegetation will be cut/trimmed in 4 to 6-foot lengths and scattered across the permanent easement to naturally decompose and to discourage OHV traffic, benefit wildlife habitat, and to decompose naturally.

Open trenches during construction have the potential to entrap deer. Within delineated big-game winter and summer range, PCGP will leave trench segments (>5 feet wide) of the proposed alignment untrenched and herbaceously vegetated (every 0.5 mile and at visible wildlife game trails) to serve as a route (i.e., green bridge or landscape connector) for big game across the construction right-of-way until pipe is ready to be installed (Forman et al., 2003). Alternatively, PCGP will install soft plugs (backfilled trench materials) in the trench after excavation at these distances to provide wildlife passage. Additionally, 20-foot gaps will be left in spoil and topsoil stockpiles at all hard or soft plug locations and a corresponding gap in the welded pipe string will be left in these locations. Suitable ramps will be installed from the bottom of the trench to the top to prevent potential wildlife entrapment within the trench.

Previously, PCGP had agreed to fund projects proposed by the Forest Service in the Fremont-Winema National Forest that included erecting 6 miles of let-down fence along Clover Creek Road and installing 3 cattle guards within the Forest. Fencing would protect wetland and riparian areas from livestock within the Spencer Creek Watershed. PCGP had also agreed to fund the Forest Service to treat approximately 113 acres by thinning forest and creating small openings adjacent to pipeline corridor along Clover Creek corridor and Dead Indian Road crossing. The projects would include fuel treatments. The Forest Service will be reviewing these projects to verify their relevance to the current proposed Pipeline. Implementation of these or similar projects would accelerate the development of late successional habitat characteristics of structure while reducing risks of stand-replacing wildfires. Proposed projects will be included in the CMP.

Forest Plan Consistency. The Proposed Action will result in forest removal but revegetation within the right-of-way following construction will create early seral forest that will eventually provide

forage, thermal and hiding cover and the 30-wide maintenance corridor will provide for travel and forage for the life of the Pipeline. The Proposed Action and mitigation projects proposed within the Fremont-Winema National Forest will be consistent with the Forest Plan.

4.8 Resident Trout

Resident trout are indicator species for riparian and aquatic ecosystems. All trout species in the Fremont-Winema National Forest that are desirable are considered as MIS. This includes native redband trout, native bull trout, and the introduced game fish; rainbow trout, brook trout, brown trout, and lake trout. Trout habitat requirements are narrow enough to represent nearly all other fish species. Trout as a group are moderately reliable in representing favorable habitat for other fish species and the presence, or potential of, other species.

The following Standards and Guidelines and Management Prescriptions were identified in the Forest Plan to conserve and manage for resident trout and their habitat:

Applicable Forest Plan Forest-wide Standards and Guidelines. The monitoring element is for fish habitat generally, and is not specified for resident trout. Monitoring questions and thresholds of concern include:

- is fish habitat capability increasing to the 80 percent level, and is the fish population changing in terms of numbers, species composition, or age structure, with the threshold of concern being any decline over three years or more of fish numbers or numbers of fish species.
- what are the effects of fish habitat improvement structures on stream channel configuration, large woody material, and fish populations, with concern with any decline in pool volume, area, or average maximum depth of Class I or Class II streams.
- what is the longevity of stream habitat structures, with concern when functional or structural failure rate of habitat improvement structures exceeding 20 percent over five years, with minor maintenance expected and not considered failure.
- what are the cumulative effects of activities on fish habitat capability and the aquatic ecosystem, with concern when a one scale-class reduction in the community tolerance quotient for macroinvertebrates as measured at established critical reach stations by basin.

Management Prescriptions. *MA 18-Fish and Aquatic Habitat and* all Management Areas through which the Pipeline will pass, which includes 3A, 3B, and 3C. See Pine Marten.

Streams shall be managed to maintain or to improve the present level of native fish habitat capability (Forest Service, 1990e).

Habitat. Within the Fremont-Winema National Forest, the Pipeline crosses one perennial stream (Spencer Creek supports resident trout) and four intermittent tributary streams (fish presence is unknown for three and assumed for the fourth) within the Spencer Creek Fifth Field Watershed. Riparian zones associated with Spencer Creek and the tributaries that will be crossed are forested with late successional-old growth forest, mid-seral forest, and regenerating forest (Table 4-5).

Table 4-5
Summary of Habitats Removed by the Proposed Action from Riparian Zones Extending One-Site Potential Tree Height From Stream Banks and Riparian Reserves in the Fremont-Winema National Forest

Fifth Field Watershed (Hydrologic Unit Code) and Riparian Zone	Forested Habitat [1]					Other Habitat [1]						Total Riparian Zone Impact(acres)
	Late Successional - Old Growth	Mid-Seral Forest	Regenerating Forest	Clearcut Forest	Forest Total	Forested Wetland	Non-Forested Wetland	Unaltered Non-Forested Habitat	Agriculture	Altered Habitat	Other Total	
Spencer Creek (HU 1710030206)												
One Site Potential Tree Height (187 feet) and Riparian Reserve	1.59	0.34	1.82	0	**3.74**	0	0.26	0.04	0	0.13	0.42	**4.16**

Species Status in the Pipeline Project Area. Oregon Department of Fish and Wildlife (ODFW) has conducted stream surveys and population surveys, downstream of the Pipeline project, and have identified Spencer Creek as a critical spawning area for Klamath River Redband trout (BLM, 2008). However, ODFW (2012b) determined that the distribution of redband trout in Spencer Creek does not extend upstream from Buck Lake, including the reach that will be crossed by the Proposed Action.

Effects of the Proposed Action. Construction of the Proposed Action will remove a total of 3.74 acres of forested vegetation within one site-potential tree height of all riparian zones crossed and within Riparian Reserves crossed in the Fremont-Winema National Forest (Table 4-5). Effects to salmonids, to instream habitats, and to riparian zones during construction and operation were analyzed and discussed in detail in the Biological Assessment and summarized above in Section 2.8 for the Umpqua National Forest. The same effects are expected for stream crossed within the Fremont-Winema National Forest.

Effects of the Proposed Action on a population of Oregon spotted frogs inhabiting Buck Lake were included in the Biological Assessment. Effects due to crossing Spencer Creek included potential impacts by acoustic shock from blasting, turbidity generated during instream construction, introduction of nonnative species and pathogens, accidental release of petroleum products, and application of herbicides. None of the potential impacts was found to adversely affect Oregon spotted frogs in Buck Lake. The same conclusion would apply to redband trout. PCGP would follow the ODFW recommended in-water construction window for Spencer Creek and other fish-bearing waterbodies in this area (July 1 through September 30; ODFW, 2008), which would minimize effects to redband trout.

Mitigation. Conservation measures to mitigate effects to salmonids within streams impacted by construction have been provided and discussed in the Biological Assessment for the Proposed Action and summarized in Section 2.8 for the Umpqua National Forest. The mitigation measures would be implemented within the Fremont-Winema National Forest.

Previously, PCGP had agreed to fund other projects proposed by the Forest Service on Fremont-Winema National Forest that included erecting 6 miles of let-down fence along Clover Creek Road and installing 3 cattle guards within the Forest. Fencing would protect wetland and riparian areas from livestock within the Spencer Creek Watershed. PCGP had also agreed to fund the Forest Service to treat 500 acres by thinning forest and creating small openings adjacent to pipeline

corridor along Clover Creek corridor and Dead Indian Road crossing. The projects would include fuel treatments. Funding would also be used to restore stream contours, improve riparian vegetation, and replace culvert, if needed, at one site. The Forest Service will be reviewing these projects to verify their relevance to the current proposed Pipeline. Implementation of these or similar projects would accelerate the development of late successional habitat characteristics of structure while reducing risks of stand-replacing wildfires. Proposed projects will be included in the CMP.

Forest Plan Consistency. The Proposed Action and proposed mitigation measures will maintain present level of native fish habitat capability and be consistent with the Forest Plan.

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