

# ENVIRONMENTAL ASSESSMENT

Upper Beaver Falls Hydroelectric Project—FERC Project No. 2593-031

Lower Beaver Falls Hydroelectric Project—FERC Project No. 2823-020

New York

Federal Energy Regulatory Commission  
Office of Energy Projects  
Division of Hydropower Licensing  
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Washington, D.C. 20426

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## ACRONYMS AND ABBREVIATIONS

Advisory Council	Advisory Council on Historic Preservation
APE	area of potential effects
ATV	all-terrain vehicle
BMP	best management practices
C.F.R.	Code of Federal Regulation
cfs	cubic feet per second
Commission	Federal Energy Regulatory Commission
CRIS	Cultural Resource Information System
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
D2SI	Division of Dam Safety and Inspections
EA	Environmental Assessment
ESA	Endangered Species Act
°F	degrees Fahrenheit
FERC	Federal Energy Regulatory Commission
FPA	Federal Power Act
FWS	U.S. Fish and Wildlife Service
gpd	gallons per day
HPMP	Historic Properties Management Plan
Interior	U.S. Department of Interior
kV	kilovolt
kW	kilowatt
kWh	kilowatt-hour
μS	micro-Siemens
mg/L	milligrams per Liter
mm	millimeters
mgd	million gallons per day
MW	megawatt
MWh	megawatt-hour
National Register	National Register of Historic Places
New York DEC	New York State Department of Environmental Conservation
NHPA	National Historic Preservation Act of 1966
NTU	turbidity
NWI	National Wetlands Inventory
Recreation Association	Beaver River Recreation Association
SHPO	State Historic Preservation Officer
TDS	total dissolved solids
TL	total length
WI/PWL	Waterbody Inventory/Priority Waterbodies List
WQC	water quality certification

## **ENVIRONMENTAL ASSESSMENT**

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Office of Energy Projects  
Division of Hydropower Licensing  
Washington, D.C.

**Upper Beaver Falls Hydroelectric Project  
FERC Project No. 2593-031 – New York**

**Lower Beaver Falls Hydroelectric Project  
FERC Project No. 2823-020 – New York**

### **1.0 INTRODUCTION**

#### **1.1 APPLICATION**

On December 30, 2015, Algonquin Power (Beaver Falls), LLC (Beaver Falls LLC) filed an application for a subsequent license to consolidate, operate, and maintain the 1.5-megawatt (MW) Upper Beaver Falls Hydroelectric Project No. 2593, and the 1-MW Lower Beaver Falls Hydroelectric Project No. 2823 (Upper and Lower Beaver Falls projects) under a single license. The subsequent license would be under FERC Project No. 2593, and include two developments: the Upper Development (FERC Project No. 2593) and the Lower Development (formerly FERC Project No. 2823). The combined Beaver Falls Project would generate an estimated 14,300 megawatt-hours (MWh) of energy annually. The two developments are located on the Beaver River in Lewis County, New York with the Lower Development dam being approximately 600 feet downstream of the Upper Development dam (figure 1 and figure 2). The project does not occupy federal land.

#### **1.2 PURPOSE OF ACTION AND NEED FOR POWER**

##### **1.2.1 Purpose of Action**

The purpose of the Beaver Falls Project is to continue to provide a source of hydroelectric power. Therefore, under the provisions of the Federal Power Act (FPA), the Commission must decide whether to issue a license to Beaver Falls LLC for the project and what conditions should be placed on any license issued. In deciding whether to issue a license for a hydroelectric project, the Commission must determine that the project will be best adapted to a comprehensive plan for improving or developing a

waterway. In addition to the power and developmental purposes for which licenses are issued (such as flood control, irrigation, or water supply), the Commission must give equal consideration to the purposes of: (1) energy conservation; (2) the protection of, mitigation of damage to, and enhancement of fish and wildlife resources; (3) the protection of recreational opportunities; and (4) the preservation of other aspects of environmental quality.

This Environmental Assessment (EA) has been prepared in compliance with the National Environmental Policy Act of 1969 to assess the environmental and economic effects associated with operating the project, alternatives to the proposed project, and makes recommendations on whether to issue a subsequent license, and if so, recommends terms and conditions to become part of any license issued.

In this EA, we assess the environmental and economic effects of: (a) continued project operation as proposed in the application and as specified in the Beaver Falls Hydroelectric Project Offer of Settlement<sup>1</sup> (Settlement Agreement) (proposed action); (b) the proposed action with additional or modified measures (staff alternative); and (c) no action. We also make recommendations to the Commission on whether to issue a subsequent license for the combined project, and if so, what conditions should be included in any subsequent license issued. The primary issues associated with relicensing the project are the effects of continued operation on: (1) water management (e.g., minimum flows within the bypassed reaches); (2) aquatic resources; and (3) recreation.

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<sup>1</sup> On August 24, 2017, Beaver Falls LLC filed the Beaver Falls Hydroelectric Project Offer of Settlement (Settlement Agreement), on behalf of itself, the U.S. Fish and Wildlife Service, and New York State Department of Environmental Conservation.

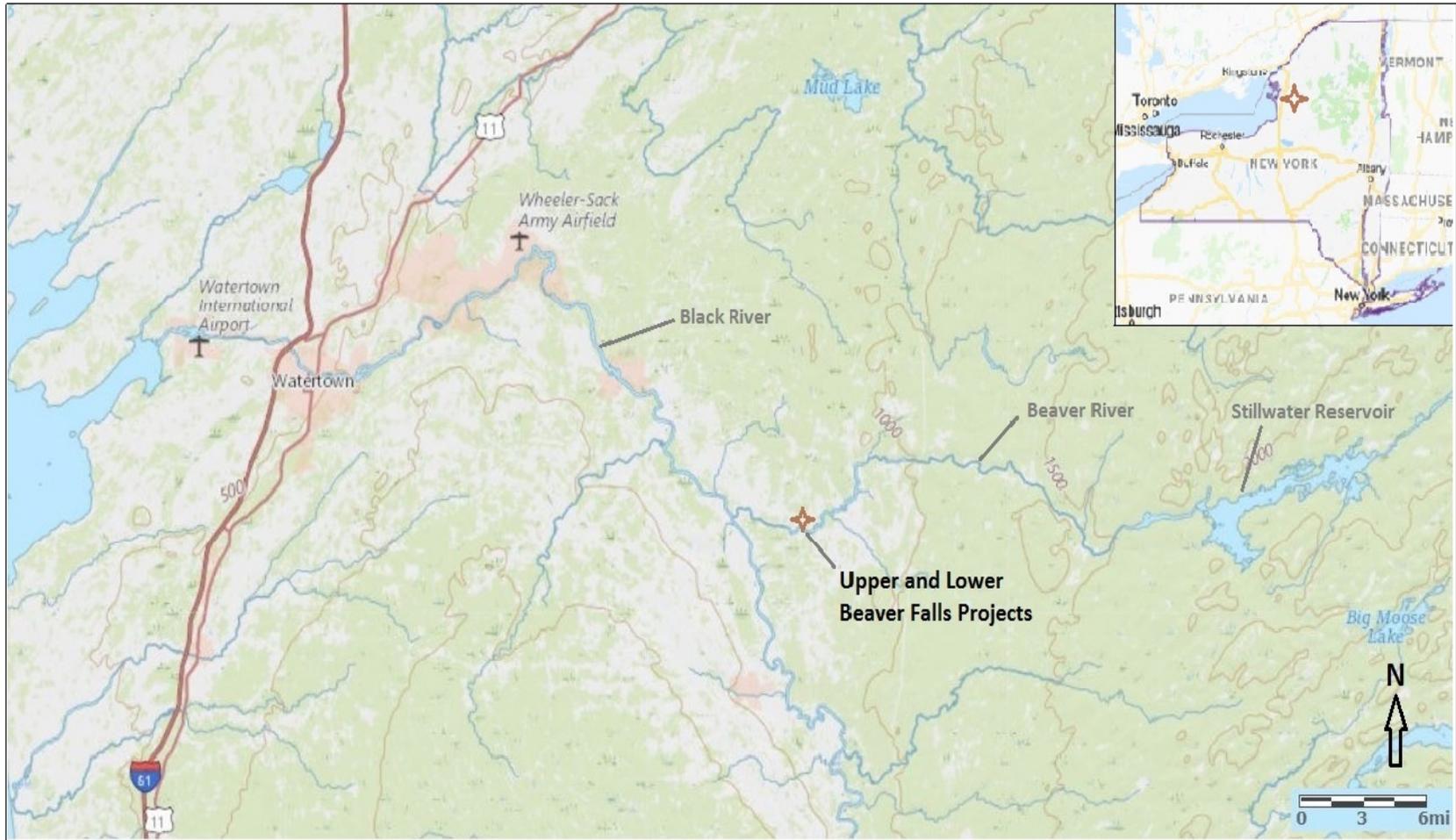


Figure 1. General location of the existing Upper and Lower Beaver Falls projects (Source: Environmental Systems Research Institute, and Google, as modified by staff).



Figure 2. Project location and facilities of the existing Upper and Lower Beaver Falls projects (Source: Google Earth 2018, as modified by staff).

## **1.2.2 Need for Power**

The Upper and Lower Beaver Falls projects provide hydroelectric generation to meet part of the State of New York's power requirements, resource diversity, and capacity needs. The projects have a combined installed capacity of 2.5 MW and generate an average of about 14,300 MWh per year.

The North American Electric Reliability Corporation (NERC) annually forecasts electrical supply and demand nationally and regionally for a 10-year period. The projects are located in the Northeast Power Coordinating Council (NPCC)-New York region of NERC. According to NERC's 2017 forecast (NERC, 2018), from 2018 to 2027, summer peak demand in the region is expected to grow at an annual rate of 0.11 percent.

Power generated by the combined Beaver Falls Project would continue to help meet a need for power in the NPCC-New York region in both the short- and long-term. The project provides power that displaces generation from non-renewable resources and contributes to a diversified generation mix. Displacing the operation of non-renewable facilities may avoid some power plant emissions, thus creating an environmental benefit.

## **1.3 STATUTORY AND REGULATORY REQUIREMENTS**

Any license for the combined Beaver Falls Project is subject to numerous requirements under the FPA and other applicable statutes. The major regulatory and statutory requirements are described below.

### **1.3.1 Federal Power Act**

#### **1.3.1.1 Section 18 Fishway Prescriptions**

Section 18 of the FPA states that the Commission is to require the construction, operation, and maintenance by a licensee of such fishways as may be prescribed by the Secretary of the U.S. Department of Commerce or the Secretary of the U.S. Department of the Interior (Interior). On April 5, 2018, Interior requests that the Commission reserve its authority to require fishways under section 18 that may be prescribed by Interior during the term of the license.

#### **1.3.1.2 Section 10(j) Recommendations**

Under section 10(j) of the FPA, each hydroelectric license issued by the Commission must include conditions based on recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, or enhancement of fish and wildlife resources affected by the projects. The Commission is required to include these conditions unless it determines that they are inconsistent with the purposes and

requirements of the FPA or other applicable law. Before rejecting or modifying an agency recommendation, the Commission is required to attempt to resolve any such inconsistency with the agency, giving due weight to the recommendations, expertise, and statutory responsibilities of such agency.

On April 5, 2018, Interior timely filed seven recommendations under section 10(j), as summarized in section 5.3, *Recommendations of Fish and Wildlife Agencies*. In section 5.3, we also discuss how we address the agency's recommendations and comply with section 10(j).

### **1.3.2 Clean Water Act**

Under section 401 of the Clean Water Act (CWA), a license applicant must obtain either water quality certification (certification) from the appropriate state pollution control agency verifying that any discharge from a project would comply with applicable provisions of the CWA, or a waiver of certification by the appropriate state agency. The appropriate state agency's failure to act on a request for certification within a reasonable period of time, not exceed to one year, after receipt of such request constitutes a waiver.

On December 21, 2017, Beaver Falls LLC applied to New York DEC for a section 401 certification for the project. New York DEC received this request on the same date. New York DEC has not yet acted on the application.

### **1.3.3 Endangered Species Act**

Section 7 of the Endangered Species Act (ESA) requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species, or result in the destruction or adverse modification of the critical habitat of such species. On March 7, 2018, Commission staff requested an official species list for the project through the U.S. Fish and Wildlife Service's (FWS) Information for Planning and Conservation (IPaC) system, which indicates that one federally listed species, the threatened northern long-eared bat (*Myotis septentrionalis*), has the potential to occur at the project.<sup>2</sup>

Our analysis of project effects on threatened and endangered species is presented in section 3.3.4, *Threatened and Endangered Species*, and our recommendations are included in section 5.1, *Comprehensive Development and Recommended Alternative*. Based on available information, we conclude that relicensing the combined Beaver Falls Project, with implementation of the proposed measures in Beaver Falls LLC's Bat and Avian Protection Plan, is not likely to adversely affect the northern long-eared bat. By

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<sup>2</sup> See March 8, 2018, official species list memorandum.

letter filed April 5, 2018, FWS determined that any take that may occur incidental to the Beaver Falls Project is not prohibited under the final 4(d) rule<sup>3</sup> and that no further ESA coordination or consultation is required.

### **1.3.4 Coastal Zone Management Act**

Under section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA), 16 U.S.C. §1456(3)(A), the Commission cannot issue a license for a project within or affecting a state's coastal zone unless the state's coastal zone management agency concurs with the license applicant's certification of consistency with the state's CZMA program, or the agency's concurrence is conclusively presumed by its failure to act within 6 months of its receipt of the applicant's certification.

In an e-mail dated March 9, 2015 and filed with Beaver Falls LLC's August 3, 2016 additional information response, the New York State Department of State indicated that the Beaver Falls Project is not located within New York State's coastal area, and that it does not anticipate that the project would have an effect on coastal uses or resources within New York State's coastal area.

### **1.3.5 National Historic Preservation Act**

Section 106 of the National Historic Preservation Act (NHPA), 54 U.S.C. § 306108, requires that every federal agency "take into account" how each of its undertakings could affect historic properties. Historic properties are districts, sites, buildings, structures, traditional cultural properties, and objects significant in American history, architecture, engineering, and culture that are eligible for inclusion on the National Register of Historic Places (National Register).

During pre-filing consultation, Beaver Falls LLC was requested by the New York State Historic Preservation Office (New York SHPO) to conduct an architectural survey and an archaeological survey to evaluate the eligibility of project facilities for listing on the National Register. On January 9, 2018, Beaver Falls LLC filed an Archaeological Shoreline Monitoring Survey report and a Historic Architectural Survey report with the Commission. The archaeological survey concluded that shoreline erosion was not occurring at the developments and because there were no known archaeological sites

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<sup>3</sup> On January 14, 2016, FWS issued a final 4(d) rule that prohibits the following activities in areas of the country impacted by white-nose syndrome: incidental take within a hibernation site; tree removal within 0.25 mile of a known, occupied hibernaculum; and cutting or destroying known occupied maternity roost trees, or any other trees within 150 feet of that maternity roost tree, during the pup-rearing season (June 1 through July 31) (FWS, 2016b).

along the shorelines of either reservoir, cultural resources were not being affected by project operation. Based on the results of the survey, Beaver Falls LLC proposed to conduct a shoreline inspection in 5 years and if there were no changes, future inspections would be reevaluated. The architectural survey did not include the Lower Development because it is less than 50 years old. In the architectural survey, Beaver Falls LLC concludes that the Upper Development does not meet any of the eligibility criteria necessary for listing in the National Register and that project operation would have no effect on historic properties.

In a letter dated August 8, 2017, filed with the cultural resources survey reports, the New York SHPO concurred that the Upper Development did not meet the criteria for listing in the National Register. In a letter filed July 9, 2018, the New York SHPO determined that no historic properties would be affected by relicensing the project with the condition that the shoreline be inspected again in 5 years to determine if any changes have occurred. If no changes are discovered, the New York SHPO recommends that further shoreline evaluations be reconsidered. In our analysis of project effects in section 3.3.6, *Cultural Resources*, and our recommendations in section 5.1, *Comprehensive Development and Recommended Alternative*, staff concludes that operation of the project would not affect cultural resources and that future surveys are not necessary.

As a result of these findings, the drafting of a historic properties management plan (HPMP) or a programmatic agreement to resolve adverse effects to historic properties would not be necessary. However, any future discoveries of cultural or historic resources made by Beaver Falls LLC could require consultation with the New York SHPO.

## **1.4 PUBLIC REVIEW AND COMMENT**

The Commission's regulations (18 C.F.R. [Code of Federal Regulation], §§ 5.1 – 5.16) require that applicants consult with appropriate resource agencies, tribes, and other entities before filing an application for a license. This consultation is the first step in complying with the Fish and Wildlife Coordination Act, ESA, NHPA, and other federal statutes. Pre-filing consultation must be complete and documented according to the Commission's regulations.

### **1.4.1 Scoping**

Before preparing this EA, we conducted scoping to determine what issues and alternatives should be addressed. We issued an initial scoping document (SD1) on November 9, 2016. It was noticed in the Federal Register on November 17, 2016. Two scoping meetings were held on December 13, 2016, to obtain comments on the projects. A court reporter recorded all comments and statements made at the scoping meetings, and these are part of the Commission's public record for the projects. No entities filed

written comments on SD1; by letter dated February 8, 2018, we indicated that staff would use SD1 to prepare the EA.

### **1.4.2 Interventions**

On February 8, 2018, the Commission issued a notice accepting Beaver Falls LLC's application for a subsequent major license for the combined Beaver Falls Project. This notice set April 9, 2018, as the deadline for filing protests and motions to intervene. The following entities filed notices of intervention or motions to intervene (none in opposition to the projects):

<u>Intervenor</u>	<u>Date Filed</u>
New York DEC	February 12, 2018
Interior	April 2, 2018

### **1.4.3 Comments on the Application**

On February 8, 2018, the Commission issued a Ready for Environmental Analysis (REA) notice for the combined Beaver Falls Project, and requested comments, recommendations, terms, and conditions. The following entities filed comments, terms and conditions, recommendations, or prescriptions:

<u>Commenting Entity</u>	<u>Date Filed</u>
Interior	April 5, 2018

Beaver Falls LLC filed reply comments on April 18, 2018 to provide an update on the project's WQC application.

## **2.0 PROPOSED ACTION AND ALTERNATIVES**

### **2.1 NO-ACTION ALTERNATIVE**

Under the no-action alternative, the projects would continue to operate as individual projects (Upper and Lower Beaver Falls projects) under the terms and conditions of the existing licenses, and no new environmental protection, mitigation, or enhancement measures would be implemented. We use this alternative to establish baseline environmental conditions for comparison with other alternatives.

### **2.1.1 Existing Project Facilities and Project Boundary**

The Upper and Lower Beaver Falls projects are located on the Beaver River, where the Upper Beaver Falls Hydroelectric Project (Upper Project) is approximately 600 feet upstream of the Lower Beaver Falls Hydroelectric Project (Lower Project). The Lower Project is approximately 4 miles upstream from the Beaver River's confluence with the Black River (figure 1 and figure 2).

The Upper Project consists of: (1) a 328-foot-long concrete gravity dam with a maximum height of 25 feet, including a 295-foot-long overflow spillway; (2) a 48-acre reservoir with a storage capacity of 800 acre-feet at elevation 799.4 feet North American Vertical Datum of 1988 (NAVD 88); (3) a 17-foot-high, 26.5-foot-wide, 27.5-foot-long intake structure with a steel trash rack; (4) a 90-foot-long, 16-foot-wide, 8-foot-high concrete penstock; (5) a powerhouse containing one turbine-generator with a nameplate rating of 1,500 kilowatts (kW); (6) a tailrace excavated in the riverbed; (7) a 2,120-foot-long, 2.4-kilovolt (kV) transmission line connecting to a regional grid via a substation; and (8) other appurtenances.

The Lower Project consists of: (1) a 400-foot-long concrete gravity dam with a maximum height of 14 feet, including: (i) a 240-foot-long non-overflow section containing an 8-foot-wide spillway topped with flashboards ranging from 6 to 8 inches in height and (ii) a 160-foot-long overflow section; (2) a 4-acre reservoir with a storage capacity of 27.9 acre-feet at a normal elevation of 769.6 feet NAVD 88; (3) an intake structure with a steel trash rack, integral with a powerhouse containing two 500-kW turbine-generator units; (4) a tailrace; (5) a 505-foot-long, 2.4-kV transmission line connected to the Upper Beaver Falls powerhouse; and (6) appurtenant facilities.

The current project boundary for the two existing projects encompasses the two project reservoirs, two powerhouses, and two recreation access sites upstream of the Upper Project. Beaver Falls LLC holds title or rights to all lands within the project boundary

### **2.1.2 Project Safety**

The Upper Project has been operating for more than 30 years under the existing license issued in 1985. The Lower Project also has been operating for many years under the existing license issued in 1979. During this time, Commission staff has conducted operational inspections focusing on the continued safety of the structures, identification of unauthorized modifications, efficiency, and safety of operations, compliance with the terms of the license, and proper maintenance. As part of the relicensing process, Commission staff would evaluate the continued adequacy of the proposed project facilities under a single, subsequent license for the combined project. Special articles

would be included in any license issued, as appropriate. Commission staff would continue to inspect the project during the license term to assure continued adherence to Commission-approved plans and specifications, special license articles relating to construction (if any), operation and maintenance, and accepted engineering practices and procedures.

### **2.1.3 Existing Project Operation**

The Upper and Lower Beaver Falls projects are located downstream of the Stillwater Reservoir which is owned and operated by the Hudson River-Black River Regulating District, and eight other hydroelectric developments associated with the Beaver River Hydroelectric Project (FERC Project No. 2645) (figure 3). Flow in the Beaver River is heavily regulated by releases from Stillwater Reservoir, which in turn affects generation at downstream hydropower facilities.

The Upper Project operates in a run-of-river mode, as required by Article 20 of the existing license. The Upper Project has a minimum hydraulic capacity of 280 cubic feet per second (cfs) and a maximum hydraulic capacity of 720 cfs. The Lower Project is also operated as a run-of-river facility. Article 26 of the existing license requires that the project release a continuous minimum flow of 88 cfs, or inflow to the project reservoir, whichever is less, below the project for the protection and enhancement of downstream aquatic resources. The minimum and maximum hydraulic capacities of the Lower Project are 230 cfs and 680 cfs, respectively.

During high flows, flow exceeding the capacity of the Upper Project spills over the dam. At the Lower Project, when flow exceeds the project capacity and water levels continues to rise, flashboards are tripped and flow spills over the dam. Both projects have a 4-foot-wide sluice gate next to each powerhouse to pass debris and excess flows, and are operated automatically with periodic inspections by project personnel.

### **2.1.4 Existing Environmental Measures**

Under the current license, Beaver Falls LLC operates both developments as described above in section 2.1.3, *Existing Project Operation*.

As required by Article 13 of the existing license, Beaver Falls LLC currently provides recreational access upstream of the Upper Project dam. Recreation access is provided at the swim beach and picnic area on the north side of the Beaver River, which is leased to the Beaver River Recreation Association, and at a small boat launch on the south side of the river.

## **2.2 APPLICANT’S PROPOSAL**

### **2.2.1 Proposed Project Facilities**

As described in the Settlement Agreement, Beaver Falls LLC proposes the following changes to project facilities: (1) constructing fish protection and passage infrastructure, including replacing the trash racks at the Upper Development with 1-inch clear spacing, placing a seasonal overlay system over the existing Lower Development trash racks, and constructing downstream fish passage facilities at the dams of both developments with 30-cfs conveyance flows;<sup>4</sup> and (2) upgrading the existing small boat launch upstream of the Upper Development on the south side of the Beaver River with improved shoreline access and a new roadside parking area.

### **2.2.2 Proposed Project Operation**

As described in the Settlement Agreement, Beaver Falls LLC proposes to operate the combined Beaver Falls Project in “strict” run-of-river mode. The Settlement Agreement defines run-of-river mode as operation where outflow from each facility is equal to inflow on an instantaneous basis, and defines strict run-of-river mode as the adherence to specific impoundment fluctuation limits at both developments. Table 1 provides the impoundment fluctuation limits for the Upper and Lower developments as defined by the Settlement Agreement. Beaver Falls LLC proposes to maintain impoundment elevations at or above the dam crests, or flashboards (Lower Development) when in place. Any deviations from the specified levels in excess of 0.5 foot below the dam crest or flashboards (when installed at the Lower Project), due to an operating emergency or other reason, would be reported to the Commission and New York DEC.

Additionally, Beaver Falls LLC proposes to provide a year-round minimum flow of 30 cfs in the Upper Development’s bypassed reach, and in the left channel of the Lower Development’s bypassed reach.<sup>5</sup>

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<sup>4</sup> Beaver Falls LLC’s January 9, 2018, additional information response provides preliminary conceptual designs for the downstream fish passage facilities, indicating that Upper Development fish passage would be provided at an existing sluice gate on the upper dam, and the Lower Development fish passage would be provided at an existing stop log bypass opening on the lower dam.

<sup>5</sup> The Settlement Agreement describes two channels in the Lower Development’s bypassed reach: a left channel (where the lower dam meets the powerhouse, on the south side of the Beaver River) and a right channel (on the north side of the Beaver River downstream of the lower dam). These channels are illustrated in figure 4. In terms of the requirement in Article 26 of the existing Lower Beaver Falls Project license (to provide

Table 1. Strict run-of-river impoundment fluctuation limits (Source: Settlement Agreement)

<b>Developments</b>	<b>Dam crest (feet) in NAVD 88<sup>6</sup></b>	<b>Reportable limit (in feet) if lower than (in NAVD 88)</b>
Upper	799.4	798.9
Lower	769.6	769.1
Lower w/flashboards	770.35	769.85

### 2.2.3 Proposed Environmental Measures

Beaver Falls LLC also proposes the following:

- Develop a stream flow and water level monitoring plan, including the installation of staff gages at both developments, per the Settlement Agreement;
- Install monitoring pins and a data logger within the right channel of the Lower Development's bypassed reach, per the Settlement Agreement;
- Develop a trash rack installation and monitoring plan, per the Settlement Agreement;
- Implement the proposed Invasive Species Management Plan filed with the Settlement Agreement;
- Implement the proposed Bat and Avian Protection Plan filed with the Settlement Agreement;
- Provide a representative for the Beaver River Advisory Council,<sup>7</sup> and contribute annually to the Beaver River Fund (\$1,100 per year for the first 15 years of the

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an 88-cfs minimum flow, or inflow, below the project), staff notes that flow duration curves provided in the license application indicate that a flow of 88 cfs is exceeded at the project 100 percent of the time, and thus the proposed strict run-of-river operation would preclude the need for a specific required minimum flow below the Lower Development.

<sup>6</sup> The Settlement Agreement provides dam crest elevations in National Geodetic Vertical Datum (NGVD). However, the license application provides these elevations in NAVD 88. As the dam crest elevations reported in the license application are the same as those in the Settlement Agreement, staff assumes that NAVD 88 is the appropriate datum for the reported elevations.

<sup>7</sup> The Beaver River Advisory Council was created during the licensing of the Beaver River Project No. 2645, in order to discuss conditions that may affect river flows and management objectives within the Beaver River. The Beaver River Advisory Council, as described in the Beaver River Project Settlement Offer (Settlement Offer) filed May 30, 1995, is chaired by New York DEC and includes signatories to the

license, and \$2,200 per year for the remainder of the license), per the Settlement Agreement;<sup>8</sup>

- Continue leasing the swim beach recreation area (swim beach area) upstream of the Upper Development to the Beaver River Recreation Association, per the proposed Final Recreation Plan filed February 23, 2018;
- Provide facility and sign maintenance at the swim beach area, per the proposed Final Recreation Plan;
- Install “end of canoe trail” signage at the existing small boat launch upstream of the Upper Development dam, per the proposed Final Recreation Plan;
- Develop an HPMP, per the Settlement Agreement; and
- Conduct a cultural resources shoreline evaluation in 2021.

### **2.3 STAFF ALTERNATIVE**

Under the staff alternative, the projects would include Beaver Falls LLC’s proposed measures with the exception of certain conditions from the Settlement Agreement (i.e., membership on the Beaver River Advisory Council and contributions to the Beaver River Fund), and the following staff-recommended modifications:

- Develop an erosion and sediment control plan to minimize effects related to improving the small boat launch upstream of the Upper Development and constructing downstream fish passage facilities and modifying trash racks at both developments;
- Modify the proposed stream flow and water level monitoring plan to include a provision for monitoring the 30-cfs conveyance flows through the Upper and Lower developments’ downstream fish passage facilities;
- Implement the proposed Final Recreation Plan, except for the requirement of leasing the swim beach recreation area to a specific entity; and
- Consult with the New York SHPO if previously unidentified cultural resources are encountered during project operation to ensure the proper treatment of these resources and discontinue all ground-disturbing activities until the proper treatment of the resources is established.

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Settlement Offer and other local representatives. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13286141>.

<sup>8</sup> The Settlement Agreement identifies the fund and membership on the Beaver River Advisory Council as “non-project measures” and states that the fund “is not intended for [use by] any of the Parties to carry out any obligations under any FERC license or amendment thereto.”

## 2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

We considered one alternative<sup>9</sup> to Beaver Falls LLC's proposal, retiring the Upper and Lower Beaver Falls projects, but eliminated it from further analysis because it is not a reasonable alternative in the circumstances of this case.

### 2.4.1 Retiring the Projects

As the Commission has previously held, decommissioning is not a reasonable alternative to relicensing a project in most cases, when appropriate protection, mitigation, and enhancement measures are available.<sup>10</sup> The Commission does not speculate about possible decommissioning measures at the time of relicensing, but rather waits until an applicant actually proposes to decommission a project, or there are serious resource concerns that cannot be addressed with appropriate measures, making decommissioning a reasonable alternative.<sup>11</sup> This is consistent with NEPA and the Commission's obligation under section 10(a) of the FPA to issue licenses that balance developmental and environmental interests.

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<sup>9</sup> As sections 14 and 15 of the Federal Power Act were waived in the licenses issued for both projects, neither issuing a non-power license nor federal takeover were applicable alternatives.

<sup>10</sup> See, e.g., *Eagle Crest Energy Co.*, 153 FERC ¶ 61,058, at P 67 (2015); *Public Utility District No. 1 of Pend Oreille County*, 112 FERC ¶ 61,055, at P 82 (2005); *Midwest Hydro, Inc.*, 111 FERC ¶ 61,327, at PP 35-38 (2005).

<sup>11</sup> See generally *Project Decommissioning at Relicensing; Policy Statement*, FERC Stats. & Regs., Regulations Preambles (1991-1996), ¶ 31,011 (1994); see also *City of Tacoma, Washington*, 110 FERC ¶ 61,140 (2005) (finding that unless and until the Commission has a specific decommissioning proposal, any further environmental analysis of the effects of project decommissioning would be both premature and speculative).

Project retirement could be accomplished with or without dam removal.<sup>12</sup> Either alternative would involve denial of the relicense application and surrender or termination of the existing license with appropriate conditions.

No participant has recommended project retirement, and we have no basis for recommending it. The power produced by the Upper and Lower Beaver Falls projects would be lost if the projects were retired, and replacement power would need to be found. There also could be significant costs associated with retiring the projects' powerhouses and appurtenant facilities.

Project retirement without dam removal would involve retaining the dams and disabling or removing equipment used to generate power. Certain project works could remain in place and could be used for historic or other purposes. This approach would require the State of New York to assume regulatory control and supervision of the remaining facilities. However, no participant has advocated this alternative, nor do we have any basis for recommending it. Removing the dams would be more costly than retiring them in place, and removal could have substantial, negative environmental effects.

### 3.0 ENVIRONMENTAL ANALYSIS

In this section, we present: (1) a general description of the project vicinity; (2) an explanation of the scope of our cumulative effects analysis; and (3) our analysis of the proposed action and other recommended environmental measures. Sections are organized by resource area, with historic and current conditions described first. The existing condition is the baseline against which the environmental effects of the proposed action and alternatives are compared, including an assessment of the effects of proposed mitigation, protection, and enhancement measures, and any potential cumulative effects of the proposed action and alternatives. Staff conclusions and recommended measures are discussed in section 5.1, *Comprehensive Development and Recommended Alternative*.<sup>13</sup>

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<sup>12</sup> In the event that the Commission denies relicensing a project or a licensee decides to surrender an existing project, the Commission must approve a surrender "upon such conditions with respect to the disposition of such works as may be determined by the Commission." 18 C.F.R. § 6.2 (2017). This can include simply shutting down the power operations, removing all or parts of the project (including the dam), or restoring the site to its pre-project condition.

<sup>13</sup> Unless noted otherwise, the sources of our information are the license application filed December 30, 2015, additional information filed by Beaver Falls LLC (July 29, 2016; August 3, 2016; November 3, 2016; September 25, 2017; January 9, 2018; and February 23, 2018), and the Settlement Agreement.

### 3.1 GENERAL DESCRIPTION OF THE RIVER BASIN

The Beaver River is a part of the Black River Basin, and is one of two significant tributaries to the Black River. Its headwaters originate in Lake Lila in the Adirondack Mountains, and it generally flows westward through Hamilton, Herkimer, and Lewis counties towards the confluence with the Black River at Naumburg, New York. The Beaver River is approximately 54.4 miles in length, drains 326 square miles, and contains a total of 624 miles of streams (New York DEC, 2007).

The Beaver River flows through four ecoregions: the Central Adirondacks, Western Adirondack Foothills, Western Adirondack Transition, and the Black River Valley. The topography and land cover of the Beaver River watershed consists mainly of hills and rounded mountains consisting of spruce, fir, and northern hardwood forests near the headwaters and gradually becomes low-rolling plains near the mouth. In addition, wetlands and high forest diversity created by logging characterizes the stretch of the Beaver River that flows through the Western Adirondack Foothills.

Water use within the project area is predominantly associated with power production, fishing, primary and secondary contact recreation, and the discharge of waste water from local industry and town municipalities.

In addition to the Beaver Falls Projects, eight other hydroelectric developments are present on the Beaver River (table 2; figure 3). These eight developments are licensed as the Beaver River Project (FERC No. 2645) and are operated in a coordinated manner as store-and-release facilities.<sup>14</sup> The operation of these projects largely depends on flows controlled by water releases from the Stillwater Reservoir (FERC Project No. 6743), which is approximately 3 miles upstream of the uppermost Beaver River Project development, the Moshier Development.

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<sup>14</sup> See August 2, 1996 order approving settlement agreement and issuing new license for the Beaver River Project No. 2645. Article 410 of the license limits maximum daily reservoir fluctuations at each of the eight project developments for the protection of wetlands, wildlife, and fish habitat. Depending on the development, reservoir fluctuations are limited to 1.0 or 1.5 feet below the normal maximum headwater elevation. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13705894>.

Table 2. FERC projects on the Beaver River (Source: license application, as modified by staff).

<b>Project / Number</b>	<b>Development</b>	<b>River Mile (Approximate)</b>	<b>Total Capacity (MW)</b>
Stillwater Project No. 6743 <sup>a</sup>	N/A	32	N/A
Beaver River Project No. 2645	Moshier	29	8
	Eagle	23	6.05
	Soft Maple	20	15
	Effley	16	2.96
	Elmer	15	1.5
	Taylorville	14	4.77
	Belfort	13	2.04
	High Falls	11	4.8
Upper Beaver Falls Project No. 2593	Upper Development <sup>b</sup>	4	1.5
Lower Beaver Falls Project No. 2823	Lower Development <sup>b</sup>	4	1

<sup>a</sup> The Stillwater Project was granted an exemption from licensing in March 1984.

The Beaver River is highly regulated by the Stillwater Reservoir which regulates discharges to maintain generation at the downstream hydropower facilities.

<sup>b</sup> As discussed above, Beaver Falls LLC proposes to combine the existing Upper and Lower Beaver Falls Hydroelectric projects into two developments within a single project.

### 3.2 SCOPE OF CUMULATIVE EFFECTS ANALYSIS

According to the Council on Environmental Quality’s regulations for implementing NEPA (40 CFR, section 1508.7), a cumulative effect is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time, including hydropower and other land and water development activities.

Based on our review of the license application and agency and public comments throughout the licensing proceeding, we did not identify any resources that may be cumulatively affected by the combined Beaver Falls Project and other activities in the basin. Although there are nine dams upstream of the Beaver River Project developments (table 2), and water is withdrawn in the project area for industrial and municipal water

supply use, our environmental analysis did not reveal the presence of project-related effects on aquatic, terrestrial, recreation, or cultural resources that would measurably contribute to cumulative, basin-wide effects on these resources.

### **3.3 PROPOSED ACTION AND ACTION ALTERNATIVES**

In this section, we discuss the effects of the project alternatives on environmental resources. For each resource, we first describe the affected environment, which is the existing condition and baseline against which we measure effects. We then discuss and analyze the site-specific environmental issues.

Only the resources that have the potential to be affected are addressed in this EA. Based on this, we have determined that geology and soils, aquatic resources, terrestrial resources, recreation, and cultural resources may be affected by the proposed action and action alternatives. We present our recommendations in section 5.1, *Comprehensive Development and Recommended Alternative*.

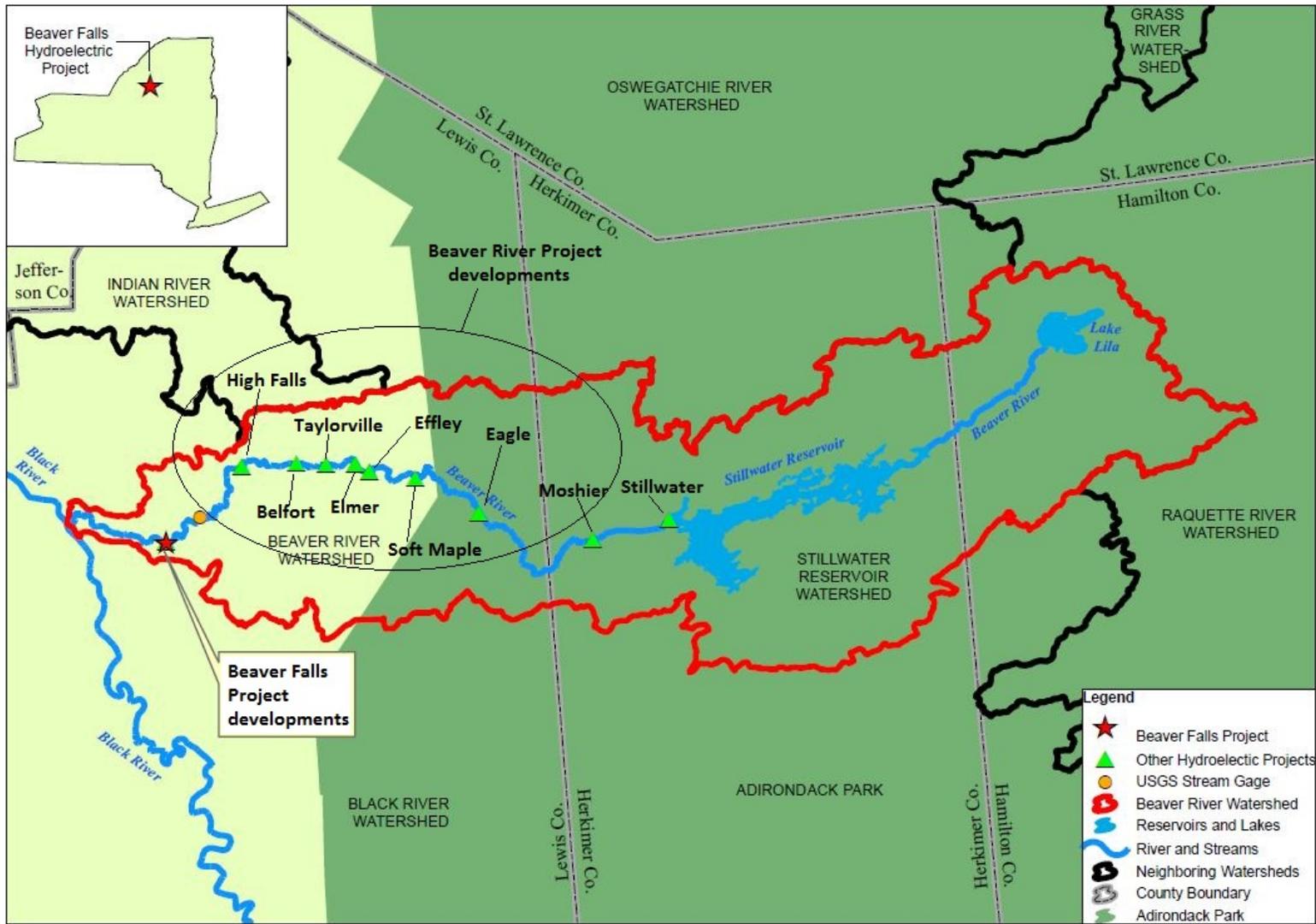


Figure 3. FERC Projects on the Beaver River (Source: Pre-Application Document, as modified by staff).

### **3.3.1 Geology and Soils**

#### **3.3.1.1 Affected Environment**

The Beaver Falls Project is located in the Adirondack physiographic province (Cooper and Mylroie 2015). Three types of bedrock are found at the Beaver Falls Project. Half of the area within the project boundary, including both development facilities, is underlain by intrusive igneous rock consisting of mangerite, pyroxene-hornblende syenite gneiss. The remaining portion of the area within the project boundary is underlain with metasedimentary rock that consists of biotite and/or hornblende granite gneiss, and metamorphic rock consisting of hornblende syenite gneiss. All three bedrock types formed during the Middle Proterozoic era, approximately 1.6 billion to 900 million years ago. Surficial geology within the project boundary is entirely composed of lacustrine sand deposits, primarily containing quartz, which were deposited during glaciation within lakes that formed at the margin of glaciers (proglaciated lakes). These deposits are well-sorted, vary in thickness from 2 to 20 meters, and are permeable. Within the project boundary, surficial deposits include till deposits of glacial origin, and lacustrine silt and clay deposits, which also formed in proglaciated lakes, but are calcareous in origin with low permeability.

Dominant soil types within the project boundary include Charlton and Paxton fine sandy loam (30.3 percent), Charlton sandy loam (23.3 percent), Rumney silt loam (9 percent), Sloan silt loam (7.4 percent), and Adams loamy fine sand on 3 to 8 percent slopes (5.5 percent). The soil types present in the vicinity of project facilities are deep, well-drained, loamy soils formed in till.

#### **3.3.1.2 Environmental Effects**

Land-disturbing activities necessary to enhance the existing small boat launch and associated access road and gravel parking lot above the Upper Development dam would involve clearing an approximately 0.1-acre<sup>15</sup> area of previously disturbed uplands along a state road.

In-water activities necessary to construct the proposed trash rack system and downstream fish passage facilities at both developments would involve the installation of cofferdams, disturbance of river-bottom materials, and temporary drawdowns of the project impoundments.

Beaver Falls LLC proposes several measures within the Invasive Species Management Plan filed with the Settlement Agreement (described below in section 3.3.3,

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<sup>15</sup> Estimated by staff, based on information provided in Beaver Falls LLC's Final Recreation Plan filed February 23, 2018.

Terrestrial Resources) to guide the revegetation of disturbed areas, including the use of mulch, straw, and other erosion and sediment control material that is invasive-free, seeding bare ground as quickly as possible following disturbance,. However, the plan does not specify the procedures to be used to minimize construction-related erosion and sedimentation.

### *Our Analysis*

The proposed recreational enhancements upstream of the Upper Development would result in some ground disturbance, which could result in limited sediment discharge into the Beaver River. Developing an erosion and sediment control plan with procedures and best management practices (BMPs) to reduce erosion, contain sediment, and stabilize soils after construction is complete, would help to minimize turbidity and sedimentation associated with the minimal land and in-water disturbance.

## **3.3.2 Aquatic Resources**

### **3.3.2.1 Affected Environment**

#### **Water Quantity and Use**

The Beaver Falls Project's drainage area is approximately 319 square miles, but is heavily regulated by the Hudson River-Black River Regulating District's Stillwater Reservoir, and eight upstream hydroelectric developments maintained as store-and-release facilities (figure 3). Monthly statistics from U.S. Geological Survey (USGS) stream gage no. 04258000<sup>16</sup> indicate relatively stable flow conditions throughout the year, with 90 and 10 percent exceedance values averaging 376 ( $\pm$  60) cfs and 1,171 ( $\pm$  274) cfs, respectively (table 3). The highest flows typically occur from January through April, while low-flow periods occur July through September. Mid-April through early-June represents a transitional period between high and low flows, but occasional high flows ( $>$ 1,500 cfs) can occur, particularly during wet years (figure 4). Based on these data, the maximum hydraulic capacity of the Upper (720 cfs) and Lower (680 cfs) developments is exceeded 45 percent and 50 percent of the time, respectively.

Instream uses of the Beaver River within the project boundary include recreation (e.g., fishing and boating) and hydroelectric generation. No additional instream uses of project waters were identified.

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<sup>16</sup> Gage datum is at 805.83 feet NAVD 88, and is located on the Beaver River approximately 0.5 mile west of the Town of Croghan, New York, at 43°53'50" latitude and 75°24'15" longitude.

Table 3. Historical monthly flow statistics<sup>a</sup> at the Beaver Falls Project during water years 1987-2016 (Source: USGS Gage No. 04258000, as modified by staff).

Month	Flow (cfs)				
	Minimum	90% Exceedance	Median	10% Exceedance	Maximum
January	281	431	809	1,184	4,351
February	307	493	812	1,151	2,510
March	289	430	816	1,249	2,762
April	285	356	905	1,852	4,888
May	70	318	738	1,557	3,913
June	202	332	583	1,088	3,124
July	206	347	545	1,011	2,334
August	80	330	550	854	2,422
September	94	334	548	861	2,729
October	156	318	585	978	3,683
November	207	369	720	1,119	2,488
December	332	452	746	1,151	2,334
<b>Annual</b>	<b>70</b>	<b>355</b>	<b>677</b>	<b>1,183</b>	<b>4,888</b>

<sup>a</sup> A proration factor of 1.096 was applied to the gage data to account for the larger drainage area of the Beaver River within the project area, compared to the gage location.

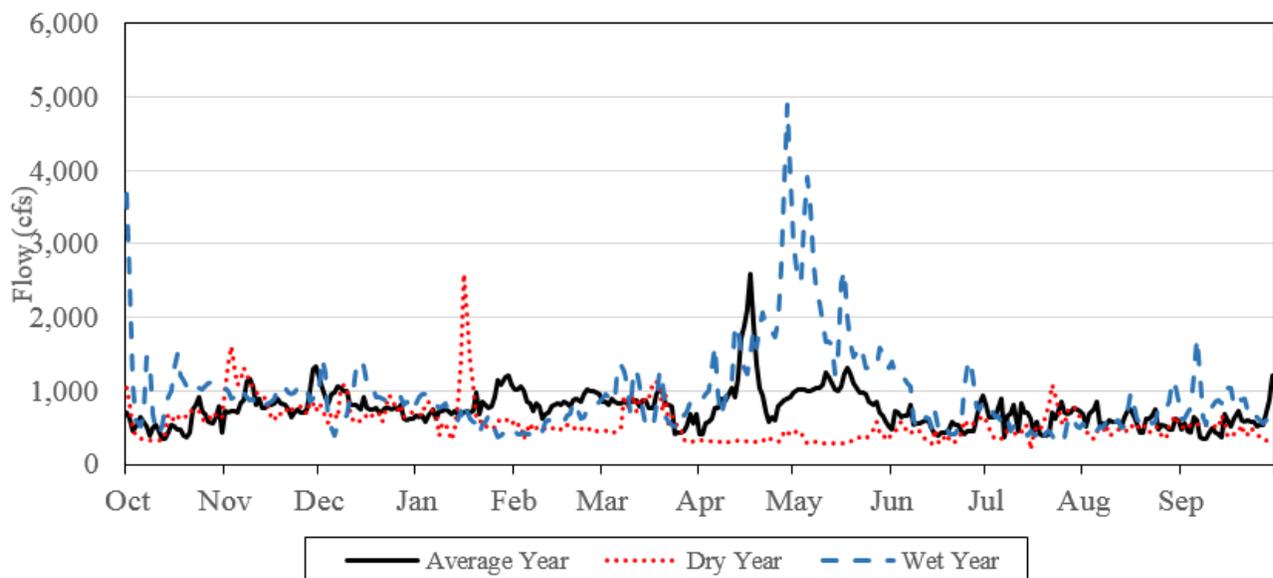


Figure 4. Annual hydrographs of inflow to the Beaver Falls Project during representative normal (2005), dry (1999), and wet (2003) years (Source: USGS Gage No. 04258000, as modified by staff).

### *Current Minimum Flows*

As described in section 2.1.3, *Existing Project Operation*, the current license for the Lower Beaver Falls Project requires Beaver Falls LLC to release a continuous minimum flow of 88 cfs below the project, or inflow to the project reservoir, whichever is less, to protect downstream aquatic resources. However, under existing project operation, watering of the Upper Development's bypassed reach, and the right (main portion) and left bypassed reach channels of the Lower Development only occurs via leakage flows or spillage over the project dams.

### *Water Withdrawals*

Consumptive use of project water is limited to direct surface withdrawals from the Beaver River at two paper mills, OmniaFiltru and Interface Solutions, located on the right bank of the river just downstream of the Lower Development tailrace. Collectively, these facilities are permitted to continuously withdraw 9.2 cfs. A municipal water supply system serving the districts of Beaver Falls and Croghan is located in the vicinity of the project. This system, rather than withdrawing from surface water, uses groundwater from two gravel-packed wells with a capacity to pump 250,000 gallons per day (gpd) (LCCP, 2009).

### *Water Discharges*

Wastewater is discharged from the Beaver Falls Sewer District (SPDES No. NY0270091; located 0.5 mile downstream of the project) and the Village of Croghan Sewage Treatment Plant (SPDES No. NY0206768; located 2.6 miles upstream of the project), accounting for approximately 20,000 gpd and 70,000 gpd, respectively (LCCP, 2009). A third upstream discharge (Beaverite Products - SPDES No. NY0070947) is also located in the area. Downstream of the Lower Development, there are discharges from two paper mills (OmniaFiltru - SPDES No. NY0002755 and Interface Solutions - SPDES No. NY0257826) and a cogeneration plant (Beaver Falls Generation Facility - SPDES No. NY0236101); the latter contributes approximately 50 million gallons per day (mgd) of non-contact cooling water [not to exceed 90 degrees Fahrenheit (°F)].

### **Water Quality**

Water quality standards are implemented by New York DEC, with oversight from the U.S. Environmental Protection Agency, to establish maximum allowable levels of chemical pollutants and serve as regulatory targets for permitting, compliance, enforcement, and monitoring and assessing the quality of the state's waters. All fresh surface waters are assigned a letter classification (e.g., A, B, C, and D) that denotes their best uses. In the vicinity of the project, the Beaver River is a Class C waterway, indicating that its best use is for fishing (table 4). Upstream of the project to High Falls

Pond is a Class B waterway. Waters in this classification are suitable for fish, shellfish, and wildlife propagation and survival, as well as primary and secondary contact recreation, although other factors may limit their use for these purposes.

New York’s Waterbody Inventory/Priority Waterbodies List (WI/PWL) compiles water quality data from New York DEC and outside sources to characterize known and suspected water quality problems, and track progress towards their resolution. The most recent WI/PWL for the Black River Basin lists the lower Beaver River (from the mouth to Beaver Falls) and all tributaries as an impaired segment, citing aesthetics (e.g., odors and floatables) as the pollutant due to direct discharges of raw sewage and septic tank effluent from approximately 55 private residences (NYSDEC, 2007) (table 5). However, in 2007, the Town of Croghan completed a new sewer collection system to service the homes and reduce the number of unregulated discharges to the river. Impairment of the remaining segments in the watershed, from Beaver Falls to Stillwater Reservoir, is due primarily to atmospheric deposition of mercury and aluminum.

Table 4. Surface waterbody classifications of the Beaver River, tributaries, and other waterbodies adjacent to the project area (Source: license application, as modified by staff).

Reach/Area	Classification	Best Uses	Notes
Mouth to Beaver Falls	C	The best usage of Class C waters is fishing. These waters shall be suitable for fish, shellfish, and wildlife propagation and survival. The water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.	Upstream extent of the segment terminates at Upper Beaver Falls Dam.
Beaver Falls to High Falls Pond	B	The best usages of Class B fresh surface waters are primary and secondary contact recreation and fishing. These waters shall be suitable for fish, shellfish, and wildlife.	Black Creek and Murmur Creek are listed separately.

In 2014, Beaver Falls LLC conducted a water quality study along the mainstem of the Beaver River from June through November using five continuous and 17 discrete monitoring stations (figures 5 and 6). Water temperature (°F) and dissolved oxygen (DO) data were collected continuously at 15-minute intervals at two stations: WQ-S1, at the upstream face of the Upper Development dam, and WQ-S2, downstream of the tailrace of the Lower Development. Stations WQ-H1 through WQ-H3 monitored only water temperature to evaluate the thermal influence of exposed bedrock and shallows

below the Lower Development spillway. Water temperature, DO, conductivity, pH, and turbidity data were measured monthly at the 17 discrete monitoring stations.

Table 5. Waterbody assessment of the Beaver River in the vicinity of the project (Source: license application, as modified by staff).

<b>Waterbody/River Segment</b>	<b>Segment Description</b>	<b>Assessment Category</b>	<b>Use(s) Impacted</b>	<b>Severity</b>
Lower Beaver River – mouth to Beaver Falls	Mouth and portions of small tributaries (Widmeyer Creek) to the Upper Project dam	Impaired	Aquatic Life Support	Impaired
			Recreation	Impaired
			Aesthetics	Impaired
Lower Beaver River – Upper Project dam in Beaver Falls to High Falls Pond	Portion of the river and selected small tributaries from Beaver Falls to High Falls	Needs Verification	Aquatic Life Support	Stressed
			Recreation	Stressed
			Aesthetics	Stressed

*Continuous monitoring*

Water temperature at stations WQ-S1 and WQ-S2 ranged from 46.3°F to 72.6°F and 46.3°F to 72.8°F, respectively, with minimum and maximum values occurring in November and July. Temperature varied by only +0.2°F between the upstream and downstream stations. At the Lower Development, water temperatures were higher in the bypassed reach compared to the tailrace, often by 3-4°F, and occurred most frequently during the summer months (July-September) when spillage and leakage flows were low or non-existent. However, due to mixing with project waters exiting the tailrace, there was no appreciable temperature effect downstream (see *Monthly monitoring* below). DO remained above the 4.0 milligrams per liter (mg/L) standard for Class C surface waters for the duration of the study, ranging from 4.4 mg/L to 11.5 mg/L at WQ-S1 and 7.5 mg/L to 12.0 mg/L at WQ-S2.



Figure 5. Continuous water quality monitoring stations at the Beaver Falls Project (Source: license application, as modified by staff).

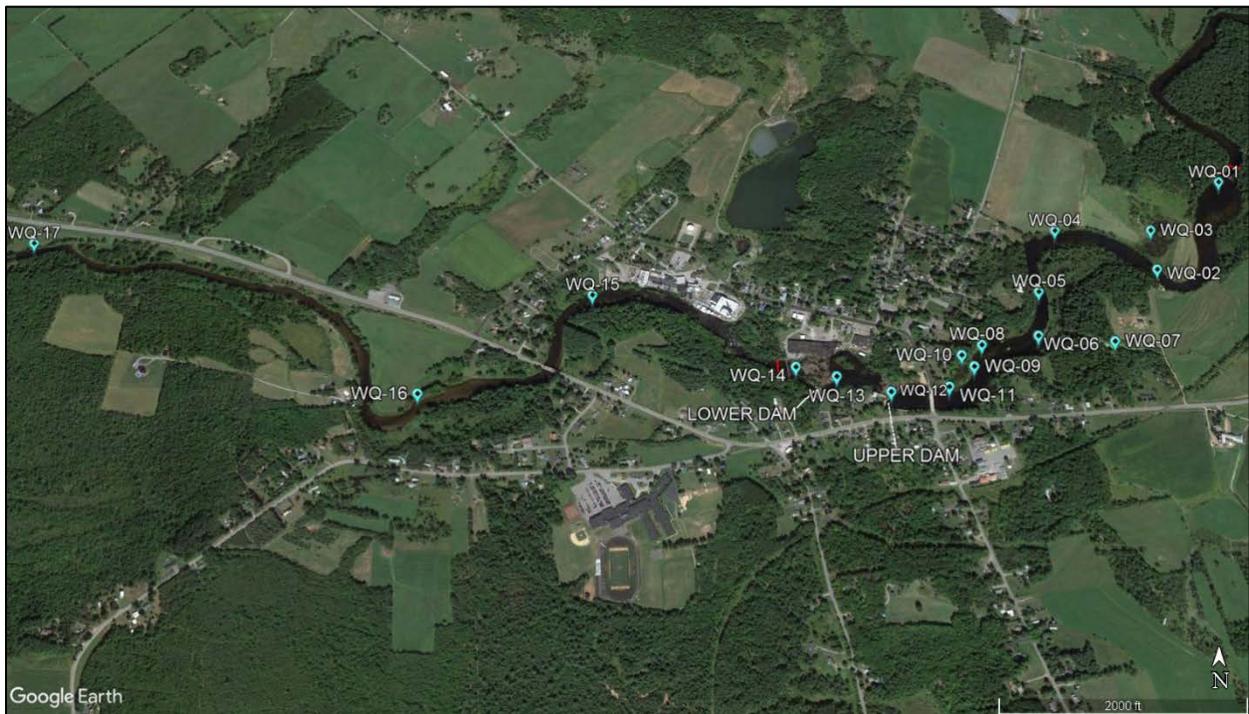


Figure 6. Monthly water quality monitoring stations at the Beaver Falls Project (Source: license application, as modified by staff).

### *Monthly monitoring*

Monthly measurements of water temperature yielded similar results to the continuous monitoring, exhibiting little to no change between upstream and downstream stations (figure 7). Seasonally, water temperature increased from the 60s (°F) in June to peak in the 70s during July and August, before falling to the mid-40s in November. DO concentrations ranged from 7.6 to 12.0 mg/L at all stations during the sampling period, with the lowest values occurring in mid-summer and the highest in November. The study's pH data were deemed unreliable; however, field data from New York DEC (2008) found April to November values ranging from 5.95 to 8.70 (laboratory results ranged from 6.20 to 6.95). Minimum values of both field and laboratory results fell below the state water quality standards during April and early-May. Conductivity was relatively low, but typical of the region with values from 20 to 40 micro-Siemens ( $\mu\text{S}$ ). There were no discernable spatial or temporal trend over the sampling period. Turbidity values generally remained between 2 and 8 Nephelometric Turbidity Units (NTU) during the study, but were highest during July (5.8 to 11.3 NTU).

### *Benthic macroinvertebrate monitoring*

Long-term (1976-2009) benthic macroinvertebrate data from New York DEC's biomonitoring program are available from a single station (Station 10) approximately 3.9 miles downstream of the Lower Development and from three additional stations sampled in 2009, two of which are located immediately upstream (Station 9a) and downstream (Station 9b) of the project, and the third (Station 9) which is upstream of the Town of Croghan (figure 8). Following protocols detailed in New York DEC (2009), multiplate samplers were deployed for 5-week intervals, and the resulting data were used to derive four metric scores: (1) Hilsenhoff Biotic Index (HBI); (2) Ephemeroptera, Plecoptera, Trichoptera taxa richness (EPT); (3) Species Richness (SPP); and (4) Species Percent Dominance.<sup>17</sup> The metrics were then assigned a Water Quality Scale score from

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<sup>17</sup> Hilsenhoff Biotic Index (HBI) - This index is a measure of the tolerance of the organisms in the sample to organic pollution and low DO levels. The presence of intolerant organisms is associated with good water quality.

Ephemeroptera, Plecoptera, Trichoptera Taxa Richness - The total number of species of mayfly (Ephemeroptera), stonefly (Plecoptera), and caddisfly (Trichoptera) taxa in the subsample. These are considered mostly clean-water organisms and their presence is associated with good water quality.

Species Richness - The total number of species or taxa found in the sample. Higher species richness values are often associated with good water quality conditions.

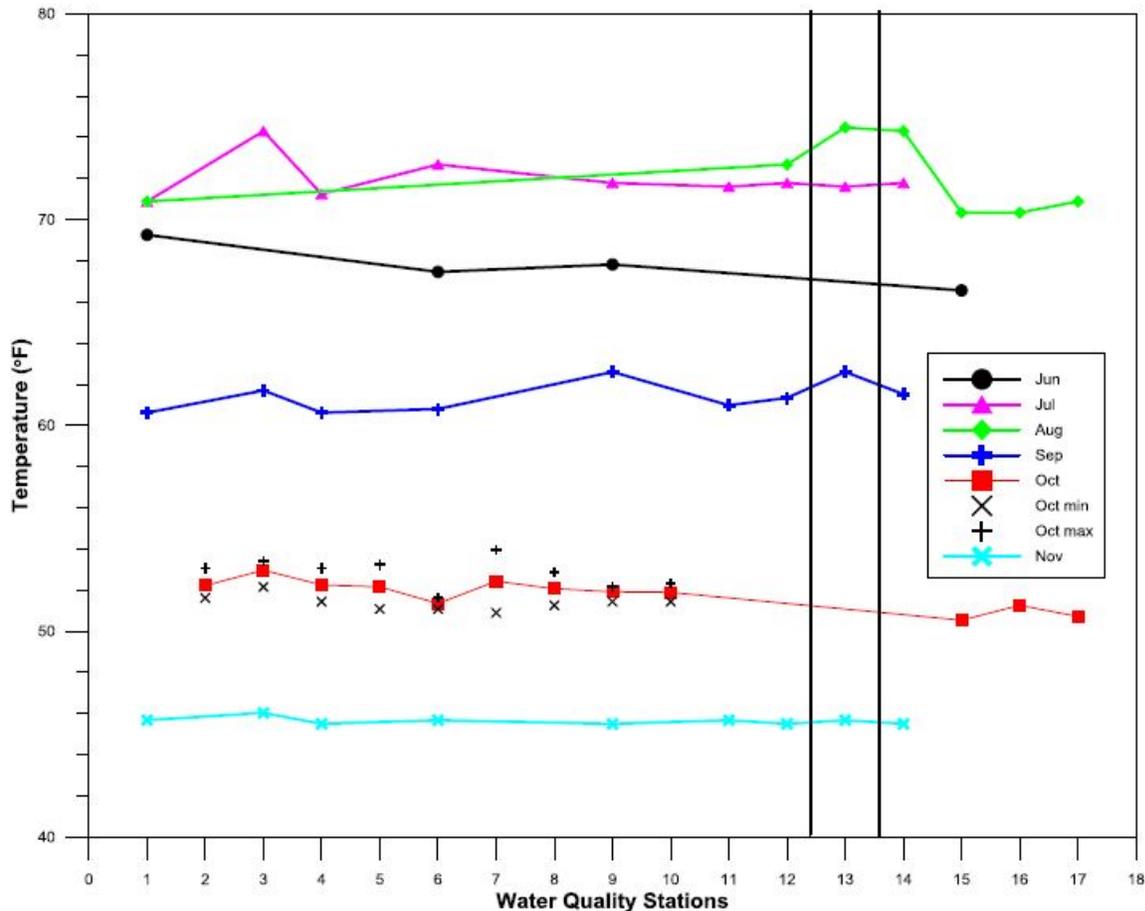


Figure 7. Monthly water temperature at stations WQ-01 to WQ-17 monitoring stations at the Beaver Falls Project. Vertical lines denote the approximate location of the project dams. (Source: license application, as modified by staff).

0 to 10, depending on the taxon and number of organisms in each sample, and used to determine categorical ratings of water quality and biological impairment (table 6).

Results of the long-term monitoring at Station 10 indicate the Beaver River is a “non-impacted” waterway. While there has been a notable decline in mean species richness from 32 taxa (non-impacted) in 1976 to 17 (slightly impacted) in 2009 and a decrease in HBI values during the same period from 5.6 to 4.8, the overall assessment remains in the “non-impacted” category (table 7). Stations from the 2009 study were also

Species Percent Dominance - Dominance is a measure of community balance, or evenness of the distribution of individuals among the species. Simple dominance is the percent contribution of the most numerous species.

characterized as “non-impacted.” Of the three stations, station 9b was rated highest, with HBI, EPT, and SPP values exceeding those of the other stations.

In 2014, Beaver Falls LLC established three benthic macroinvertebrate sampling stations (Sites 1-3) using New York DEC’s biomonitoring protocols to determine if any immediate downstream impairment resulted from the project or its operation (figure 8). While the species richness metric suggested some level of impairment at all three sites, the strength of the remaining metrics confirmed the results of previous studies and characterized the sites as “non-impacted.”



Figure 8. Benthic macroinvertebrate monitoring stations at the Beaver Falls Project, 2009 (Station 9A and 9B) and 2014 (Sites 1-3). Station 9, near the Town of Croghan to the east of the project, is not pictured. (Source: license application, as modified by staff).

Table 6. Impairment category and biological impairment metrics for multiplate samplers in navigable waters (Source: license application).

<b>Impairment Category</b>	<b>Water Quality Scale</b>	<b>Species Richness</b>	<b>Hilsenhoff Biotic Index</b>	<b>EPT Index</b>
Non-impacted	7.51-10	>22	0-7.0	>3
Slightly impacted	5.1-7.5	17-21	7.0-8.0	2.5-3.0
Moderately Impacted	2.51-5.0	12-16	8.0-9.0	2.0-2.5
Severely impacted	0-2.5	0-11	9.0-10.0	<2

Table 7. Mean metric scores for species richness, HBI value, and EPT value at benthic macroinvertebrate sampling stations, 1976-2009. (Source: license application, as modified by staff).

<b>Station Number</b>	<b>Year</b>	<b>Species Richness</b>	<b>HBI Value</b>	<b>EPT Value</b>
10	1976	32	5.6	7.67
10	1982	25	5.01	6.33
10	1991	18.76	4.63	9.33
10	1992	23.33	5.12	8.33
10	1997	25.33	4.82	9.33
10	2002	17.67	4.92	5.00
10	2007	20.33	4.73	9.00
10	2009	17.33	4.80	8.00
9	2009	18.33	5.76	5.67
9a	2009	22.33	4.72	8.67
9b	2009	29.33	5.48	10.33
Station 1	2014	19	5.36	7
Station 2	2014	17	5.35	7
Station 3	2014	14	6.33	6

### **Aquatic Habitat**

Aquatic habitat data are not available in the vicinity of the project. However, during fisheries surveys from 1992 to 2010, New York DEC characterized substrate conditions at three segments of the Beaver River: at the mouth; from State Highway 812 to the confluence of Murmur Creek (located near the High Falls Development of the Beaver River Project, see table 2); and immediately downstream of the reservoir for the Soft Maple Development (also part of the Beaver River Project). At the mouth of the river (river mile 0.0 to 1.7), substrate is primarily sand, interspersed with boulders. Sand continues to dominate between State Highway 812 and Murmur Creek (river mile 8.2 to 8.6), but silt is also present. In the upstream reach, immediately downstream of the Soft Maple Development reservoir (river mile 17.7 to 20.7), substrate is characterized as a mix

of cobble, gravel, boulder, and sand, with some woody debris and aquatic vegetation. Flow velocities in this area are moderate, at 0.8 to 2.0 feet per second.

### **Fishery Resources**

Twenty-three fish species comprising 10 families have been documented from the mouth of the Beaver River upstream to the Moshier Development reservoir (table 8). The lower portion of the river (from the mouth, upstream to State Highway 812), which includes the project developments (located at river mile 4.9), supports a warmwater<sup>18</sup> fish assemblage, dominated by pumpkinseed, golden shiner, and common carp. Recreationally important species include walleye, smallmouth bass, yellow perch, and brown bullhead. The upper portion of the Beaver River, from the Soft Maple Development reservoir upstream to the dam at the Moshier Development reservoir, transitions from a warmwater assemblage to a mixture of warmwater and coolwater<sup>19</sup> species. Brook trout and eastern blacknose dace are the most abundant species. In addition to brook trout, recreational species include brown trout, smallmouth bass, and brown bullhead. Stocking is common in the reservoirs. Since 2011, tiger muskie (northern pike X muskellunge) have been stocked annually (1,000 to 1,600 fish) in the Soft Maple Development reservoir. During the same period, the Moshier Development reservoir received 800 and 1,400 tiger muskie in 2011 and 2012, respectively, and the Stillwater Project reservoir, with the exception of 2014, received approximately 1,000 to 1,500 splake (brook trout X lake trout) annually.

#### *Project Area Fish Surveys*

Fish surveys were conducted in the project area during June, August, and October 2014 using boat electrofishing, minnow traps, and angling (ASA-IA, 2016). All specimens were identified to species and enumerated, and external health conditions (e.g., lesions, abrasions, external parasites, deformities, fin erosion) were evaluated on a subset of 30 individuals of each species per site. Age-growth determinations via scale samples were made from a subset of select sportfish and panfish.

A total of nineteen species were collected during the study, most of which had been previously documented by New York DEC (table 8). Species representing the family Cyprinidae (minnows) were most abundant, particularly golden shiner and fallfish, which comprised 46 and 20 percent of the overall catch, respectively. The remaining

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<sup>18</sup> Warmwater species prefer maximum summer water temperatures exceeding 77°F (Lyons et al., 2009).

<sup>19</sup> Coolwater species prefer maximum summer water temperatures between 72°F and 77°F (Ibid).

species each comprised less than 8 percent of the total number of fish captured. Gamefish included brown bullhead, chain pickerel, northern pike, smallmouth bass, rock bass, pumpkinseed, yellow perch, and walleye. Of these, reliable age-growth data were only collected on smallmouth bass as sample sizes of the other species were less than seven individuals. The total length<sup>20</sup> (TL) of smallmouth bass ranged from 146 to 437 millimeters (mm) (mean TL: 234 mm) and represented ages 2 to 5 years.

Table 8. Fish species documented from 2014 licensee studies and historical accounts by New York DEC in the Beaver River. (Source: license application, as modified by staff).

Family	Common Name	Scientific Name	River mile 0 - 5		River mile 5 - 11		River mile 11 - 28
			2014	DEC	2014	DEC	DEC
<b>Cyprinidae (Minnows)</b>							
	Common carp	<i>Cyprinus carpio</i>	X	X			
	Golden shiner	<i>Notemigonus crysoleucas</i>	X	X	X	X	
	Spottail shiner	<i>Notropis hudsonius</i>		X			
	Eastern blacknose	<i>Rhinichthys atratulus</i>	X		X		X
	Creek chub	<i>Semotilus atromaculatus</i>			X		X
	Fallfish	<i>Semotilus corporalis</i>	X	X			
<b>Catostomidae (Suckers)</b>							
	White sucker	<i>Catostomus commersoni</i>	X		X		
	Creek chubsucker	<i>Erimyzon oblongus</i>			X		
	Northern hog sucker	<i>Hypentilium nigricans</i>	X				
<b>Ictaluridae (Catfish)</b>							
	Brown bullhead	<i>Ameiurus nebulosus</i>	X	X	X	X	X
<b>Salmonidae</b>							
	Brook trout	<i>Salvelinus fontinalis</i>					X
<b>Esocidae (Pike)</b>							
	Northern pike	<i>Esox lucius</i>	X	X			
	Chain pickerel	<i>Esox niger</i>	X	X	X	X	X
<b>Umbridae (Mudminnow)</b>							
	Central mudminnow	<i>Umbra limi</i>	X	X	X		
<b>Gadidae (Burbot)</b>							
	Burbot	<i>Lota lota</i>	X				
<b>Fundulidae (Killifish)</b>							
	Banded killifish	<i>Fundulus diaphanus</i>				X	
<b>Centrarchidae (Sunfish)</b>							

<sup>20</sup> Total length is the length of a fish measured along the midline from the tip of the snout to the tip of the longer lobe of the tail, with the lobes compressed.

Rock bass	<i>Ambloplites rupestris</i>	X	X	X	X	X
Pumpkinseed	<i>Lepomis gibbosus</i>	X		X	X	X
Smallmouth bass	<i>Micropterus dolomieu</i>	X	X	X		X
Black crappie	<i>Pomoxis nigromaculatus</i>				X	
<b>Percidae (Perch)</b>						
Tessellated darter	<i>Etheostoma olmstedii</i>		X	X	X	
Yellow perch	<i>Perca flavescens</i>	X	X			X
Walleye	<i>Sander vitreum</i>	X	X			

Several species, including common carp, fallfish, northern hog sucker, northern pike, burbot, yellow perch, and walleye were only found downstream of the project. Similarly, creek chub, creek chubsucker, and tessellated darter were only collected from the main channel of the river, upstream of the upper impoundment. Between the Upper and Lower developments, smallmouth bass and rock bass were the only species captured; however, the low diversity is likely the result of limited angling, which was the only collection method available due to access and safety concerns.

No state-listed threatened or endangered fishes have been documented in the vicinity of the project.

### **Aquatic Macroinvertebrates**

The 2014 benthic macroinvertebrate surveys of the Upper (Site 1 and 2) and Lower developments (Site 3) yielded a total of 531 organisms, representing 15 families and 26 taxa. The families Chironomidae (midges) and Naididae (oligochaetes) were nearly equally represented at Site 1 and 2, each accounting for approximately 30 to 35 percent samples. However, Chironomidae accounted for nearly 61 percent of the total organisms collected at Site 3. While overall abundance was the highest at Site 3 (218 organisms), taxa richness was higher upstream (19 and 17 taxa at Sites 1 and 2, respectively) than downstream (14 taxa).

### **Freshwater Mussels**

Recent surveys of freshwater mussels (Unionidae) have not been conducted in the project area; however, Buckley (1977) (as cited in ASA-IA, 2016) documented four species in the Beaver River Basin, one in the mainstem and three in tributaries (table 9). Two additional species, eastern floater and squawfoot, are known to occur in the Black River, upstream of its confluence with the Beaver River. These species are all generally characterized as common and widespread in the state, and are (often) locally abundant (Strayer and Jirka, 1997). None are state-listed or federally listed as threatened or endangered.

Table 9. Mussel species documented in the Beaver and Black River basins. (Source: license application, as modified by staff).

<b>Common Name</b> <i>(Scientific Name)</i>	<b>Location</b>	<b>Fish Hosts</b>
Creek heelsplitter <i>(Lasmigona compressa)</i>	Murmur Creek, Beaver River	slimy sculpin, spotfin shiner, black crappie, yellow perch
Eastern elliptio <i>(Elliptio complanata)</i>	Murmur Creek; Beaver River; High Falls Impoundment; Unnamed Tributary	yellow perch
Triangle floater <i>(Alasmidonta undulata)</i>	Murmur Creek, Beaver River	common shiner, eastern blacknose dace, longnose dace
Eastern pearlshell <i>(Margaritifera margaritifera)</i>	Black Creek, Beaver River	brook trout, brown trout, rainbow trout
Eastern floater <i>(Pyganodon cataracta)</i>	Upper Black River Basin	eastern blacknose dace, common shiner, rock bass, pumpkinseed, yellow perch
Squawfoot <i>(Strophitus undulates)</i>	Upper Black River Basin	spotfin shiner, fathead minnow, black bullhead, yellow bullhead, largemouth bass, bluegill, walleye

### 3.3.2.2 Environmental Effects

#### Water Quality

Water quality parameters in the vicinity of the project are generally consistent with levels specified by the State’s standards and there have been no recommendations made by the commenting entities regarding measures required to protect or enhance water quality. The Settlement Agreement also does not include any specific measures to address water quality.

#### *Our Analysis*

Recent studies of water quality (2014) and benthic macroinvertebrates (2009 and 2014) in the vicinity of the project show no indication of biological impairment. As described in section 3.3.2.1, DO concentrations remained above the 4.0 mg/L standard for Class C surface waters and exhibited little variation between sampling locations

immediately above the Upper Development dam and downstream of the Lower Project tailrace. Turbidity and pH were at levels consistent with state standards during most of the 2014 study except during July when turbidity exceeded 5 NTUs) and during April to early May when pH was less than 6.5, respectively. Other parameters, including water temperature and conductivity are typical of the region and supportive of aquatic life. Similarly, results from seven sampling stations during two separate macroinvertebrate studies yielded categorical ratings of “non-impacted.”

The aforementioned studies document improved water quality conditions in the Lower Beaver River since the most recent WI/PWL was published in 2007. Given that the Town of Croghan completed its sewer collection system later that year to further improve water quality, it is likely that these results conservatively characterize current conditions. Further, there is no evidence to suggest that project operation adversely affects water quality.

### Mode of Operation

Under its current license, Beaver Falls LLC operates the Upper and Lower developments in run-of-river mode, whereby outflow at the tailwaters approximates inflow to the project impoundments. Compared to other modes of operation (e.g., peaking and storage projects), the shorter water residence times in run-of-river impoundments minimizes water level fluctuations and associated scour, as well as water temperature fluctuations.

In its Settlement Agreement, Beaver Falls LLC proposes (within 2 years of license issuance) to operate the Upper and Lower developments in a strict run-of-river mode, making a good faith effort to maintain impoundment elevations at or above the dam crest, or flashboards when in place at the Lower Development. As presented in table 1, any decrease in impoundment elevation exceeding 0.5 foot below the dam crests or flashboards would be a reportable event.<sup>21</sup>

Interior recommends that Beaver Falls LLC limit daily impoundment fluctuations at both the Upper and Lower developments with a tolerance of 0.5 foot below the dam crest or flashboards (when installed at the Lower Development) and operate the project in a strict run-of-river mode as described in section 3.1 of the Settlement Agreement.

### *Our Analysis*

As noted above in this section (see *Water Quality*), studies conducted by Beaver Falls LLC under existing run-of-river operation did not reveal any adverse environmental

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<sup>21</sup> Notification via email to New York DEC and a formal filing to FERC through the E-File system with a hardcopy to New York DEC within 10 days of the occurrence.

effects of the project on water temperature, DO, pH, conductivity, or turbidity. Water quality parameters exhibited little to no fluctuation between sampling locations upstream and downstream of the project and, with the exception of turbidity values in July and pH values in April to early May, were at levels consistent with state water quality standards.

Operating the project in run-of-river mode, and limiting impoundment fluctuations below the dam crests or flashboards (Lower Development) to less than 0.5 foot, would continue to minimize project effects on water quality, particularly water temperature and DO concentrations, and downstream flow regimes. Further, the resulting stability of impoundment levels and project flows would reduce the potential for stranding of fish and other aquatic organisms and the disruption to habitat necessary for feeding, cover, spawning, and rearing.

#### Flow Releases to the Bypassed Reach

Under existing conditions, flows to the bypassed reach of the Upper Development and the right (main portion) and left channels of the Lower Development bypassed reach are provided by leakage flows or spillage over the project dams. As described in its Settlement Agreement, Beaver Falls LLC proposes to provide a year-round minimum flow of 30 cfs to the bypassed reach of the Upper Development and to the left channel of the Lower Development via a downstream fish passage system within 5 years and 3 years of any license issued, respectively (see *Fish Protection and Passage* below). The parties agree that the right channel of the Lower Development's bypassed reach appears to be adequately watered and stable under current conditions; however, Beaver Falls LLC proposes to install monitoring pins (to demarcate the current water level) and data loggers within 1 year of license issuance to confirm their supposition. In consultation with New York DEC and FWS, the monitoring data would be evaluated for a 1-year period to ensure that water levels would be maintained at or above the monitoring pin locations. If flows are found to not always exceed the monitoring pin height, either at the time of evaluation or at any point in the future, Beaver Falls LLC would provide the required equivalent flow within 5 days of determination through notches in the flashboard or other means.<sup>22</sup> Under the Settlement Agreement, flows to the bypassed reaches may be curtailed or suspended by the licensee,<sup>23</sup> but must be reported to New York DEC and FERC within 10 business days.

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<sup>22</sup> Flows would be provided within 5 days of a determination by the licensee in consultation with New York DEC and FWS provided it is safe to do so at the time.

<sup>23</sup> Flow releases may be altered for short periods upon mutual agreement with New York DEC or in response to an operating emergency.

Interior recommends Beaver Falls LLC provide a year-round, 30-cfs flow into the bypassed reaches at both the Upper and Lower developments concurrent with the implementation of the downstream fish passage facilities to be installed at the project and maintain or supplement flows to ensure adequate and stable watering of the right channel of the Lower Development (as described in section 3.2 of the Settlement Agreement.)

### *Our Analysis*

In a November 9, 2017, letter, staff requested that Beaver Falls LLC provide additional information on its Settlement Agreement terms, including: (1) characterizing the current and proposed flow conditions in the bypassed reaches; (2) providing a description of how the 30 cfs standard was derived and deemed adequate to augment flows in the bypassed reaches; and (3) providing a list of target aquatic species for which the flows and habitat would be maintained. In its January 9, 2018, response, Beaver Falls LLC describes flow conditions in the bypassed reaches of the Lower Development under normal pool elevation, but gives no information on the proposed augmented flows as staff had requested. Beaver Falls LLC also states that parties of the Settlement Agreement visually assessed releases of 30 cfs, concluding that they “adequately wetted” the bypassed reaches of the Upper Development and the left channel of the Lower Development. However, Beaver Falls LLC only justifies the 30-cfs flow as meeting generic FWS (2017a) criteria<sup>24</sup> for fish passage conveyance flows and does not provide site-specific information demonstrating that it would protect and enhance aquatic habitat. Because the proposed flows meet the primary objective of fish conveyance, Beaver Falls LLC states that no additional flows were considered or evaluated. Lastly, Beaver Falls LLC indicates that the target aquatic species for the flows in the bypassed reaches are “all macroinvertebrates.”

For these reasons, there is insufficient support for the Settlement Agreement proposal for year-round 30-cfs minimum flows at either development, or Beaver Falls LLC’s statement that a 30-cfs flow would protect and enhance aquatic habitat in the bypassed reaches over existing conditions. It is unclear how, and to what extent, the augmented flows would benefit macroinvertebrates. Further, in the absence of photographic evidence and physical data supporting the 30-cfs minimum flow proposal, an evaluation of additional flows, and an identification of targeted species, we are unable to independently confirm the stated benefits of the proposed minimum flows beyond conveying fish through the proposed downstream fish passage facilities.

There is also insufficient support for the Settlement Agreement’s provision to monitor flow in the right bypassed channel of the Lower Development, as there is no expected change to flows in that channel over existing conditions. Because Beaver Falls

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<sup>24</sup> Minimum conveyance flows are recommended as 5 percent of station hydraulic capacity or 25 cfs, whichever is larger.

LLC indicates that current leakage flows were determined to be “adequate” based on a single observation of a single flow scenario, without the benefit of evaluating additional releases, any proposed changes to flows from monitoring would be based on an unsubstantiated reference point.

### Fish Protection and Passage

Under the Settlement Agreement, trash rack replacement and the construction of downstream fish passage facilities are identified as separate measures. While we acknowledge these features individually, we present them jointly as they collectively provide protection measures that benefit fisheries resources (specifically walleye, smallmouth bass, yellow perch, chain pickerel, and northern pike) at the project developments.

As specified in the Settlement Agreement, with clarification in its January 9, 2018, letter, Beaver Falls LLC proposes to install a new intake trash rack system at the Upper Development and use seasonal overlays (March 15 through November 30) at the Lower Development. Both options would employ 1-inch clear spacing and maintain 2-foot-per-second or less intake velocities. The proposed downstream fish passage facilities would be located adjacent to the intake trash racks of each development and, as specified in FWS (2017a), would employ “fish friendly”<sup>25</sup> design features, including a proposed year-round minimum 30-cfs conveyance flow for the downstream fish passage facilities. Final design and engineering specifications of both measures would be completed within 2 years of license issuance in consultation with New York DEC and FWS, with full implementation within 5 years (Upper Development) and 3 years (Lower Development) of license issuance.

In consultation with New York DEC and FWS, Beaver Falls LLC would also develop a trash rack installation and monitoring plan at least 1 year prior to installation of the seasonal trash rack overlays. The plan would specify the terms under which the seasonal trash racks would be operated and would define criteria used to evaluate the effectiveness of the overlays and determine whether permanent installation would be warranted.

As described in section 3.3 of the Settlement Agreement, Interior recommends Beaver Falls LLC design and install trash racks with either 1-inch clear spacing or the

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<sup>25</sup> The proposed “fish-friendly” features include no sharp edges or protrusions at the entrance to the passage facility; smooth surfaces on the pipe or sluice used to transport fish; a minimum plunge pool depth of at least 1 foot for each 4 feet of drop; and adequate depth and passage for fish after exiting the plunge pool.

equivalent (e.g., an overlay-type system) and construct downstream fish passage facilities at both the Upper and Lower developments.

### *Our Analysis*

The downstream movement of fishes at the project is currently limited to passage through the project turbines or over the spillways during high-flow events. While there are no studies of turbine-related fish mortality available with the current trash rack specifications at the Upper (2 5/8 inch clear spacing, 3.76 foot per second intake velocity) and Lower (1 3/4 inch clear spacing; 1.63 foot per second intake velocity) developments, the proposed measure would be more protective than existing conditions as the 1-inch clear bar spacing would prevent all but the smallest fish from passing through the intake structures. Studies by Lawler et al. (1991), indicate that 1-inch clear spacing would generally prevent the passage of 9-inch (TL) smallmouth bass and 11-inch (TL) walleye, thus eliminating the possibility of resident adults entering the project turbines. Also, given that fish can generally swim about 8 to 12 body lengths per second in a burst mode<sup>26</sup> (Bell, 1986; Videler and Wardle, 1991; Aadland, 2010), fish as small as 4 inches could escape the proposed 2-foot per second maximum intake velocity. As a result, only fish less than 4 inches would be susceptible to impingement and entrainment mortality at the project and losses would unlikely approach a magnitude that would adversely affect the local populations.

The proposed downstream fish passage facilities would directly benefit fisheries resources by providing a safe and efficient alternative to downstream passage through the project turbines or spillage over the dams. Indirectly, the design specifications, including the year-round minimum 30-cfs conveyance flows, would create appropriate hydraulic signals (e.g., velocity, acceleration, turbulence, and sound) to help guide fish away from the adjacent turbine intakes, thereby enhancing the protections that would be offered by the proposed trash rack replacement.

### Stream Flow and Water Level Monitoring Plan

As described above, the project is proposed to operate in strict run-of-river mode. Accordingly, the reduction of the developments' impoundment fluctuations warrants an accurate and timely method of monitoring project flows and impoundment elevations to achieve compliance. Thus, per the Settlement Agreement, Beaver Falls LLC proposes to develop a stream flow and water level monitoring plan in consultation with New York DEC and FWS that includes provisions for the installation of staff gages at appropriate locations at both developments for verification of head pond water level. The plan would be finalized and all necessary equipment (e.g., staff gages, head pond gages, and

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<sup>26</sup> Burst swim speeds are the highest speeds attainable by fish and can be maintained for periods of less than approximately 20 seconds (Beamish, 1978).

monitoring pins) would be calibrated and made operational within 2 years of license issuance. Beaver Falls LLC would maintain records in a spreadsheet format in intervals ranging from 15 minutes to 1 hour, and in increments from 0.1 foot to 1.0 foot. All records would be available for visual inspection within 5 business days, or in written form within 30 days of the licensee's receipt of a written request. Reporting, to ensure compliance with the proposed run-of-river flow requirements, would occur at 6-month intervals over the first 2 years, followed by annual reporting for 2 years, and then every 5 years.

Interior recommends Beaver Falls LLC develop and maintain a stream flow and water level monitoring plan in consultation with, and approved by, the New York DEC and FWS (as described in section 3.5 of the Settlement Agreement).

### *Our Analysis*

As stated in section 3.5 of the Settlement Agreement, the proposed stream flow and water level monitoring plan would direct the installation of staff gages at both developments and specify reporting requirements, thereby allowing New York DEC, FWS, and Commission staff to independently verify compliance with strict run-of-river operation and flow requirements. Monitoring would benefit the licensee as the availability of instantaneous data would allow for better evaluation and management of unit trips, refilling periods, and upstream peaking flows. In turn, the improved responsive management of impoundment levels and project flows would offer greater stability in spawning, rearing, and over-wintering habitats, thereby minimizing the effects of project operation on aquatic biota.

As presented in the Settlement Agreement, it is unclear if the proposed plan would include monitoring the 30-cfs conveyance flows for the proposed downstream fish passage facilities (see above in *Flow Releases to the Bypassed Reach* and *Fish Passage and Protection*, respectively). Nevertheless, any final stream flow and water level monitoring plan should include monitoring the conveyance flows for the downstream fish passage facilities to ensure compliance with the proposed measures.

### Short-term Construction Effects

Construction of Beaver Falls LLC's proposed trash rack system and downstream fish passage facilities would likely require the installation of cofferdams, disturbance of

river-bottom materials, and temporary drawdowns of the project impoundments. Therefore, these activities have the potential to cause erosion and sedimentation.

### *Our Analysis*

The proposed construction could increase erosion and mobilization of sediment, thereby affecting water quality and aquatic habitat. Implementing specific measures to control erosion and sedimentation during construction would help ensure that water quality and aquatic habitat are protected. While the magnitude of the construction effects would likely be minimal and of short duration, the development of an erosion and sediment control plan, as described above in section 3.3.1, *Geology and Soils*, would minimize these effects.

## **3.3.3 Terrestrial Resources**

### **3.3.3.1 Affected Environment**

Upland habitat within the majority of the project boundary has been modified by human activity, including both project developments and industrial land uses along the north side of the river. The project is located within the northern hardwood forest community, with many species common in boreal forests to the north and oak-hickory forests to the south (Kricher, 1988).

### **Wetlands**

Wetland habitat present in the vicinity of the project includes the riverine habitat of the Beaver River, classified in FWS' National Wetlands Inventory (NWI) as permanently flooded, lower perennial riverine habitat with an unconsolidated bottom (R2UBH) above the Upper Development and below the Lower Development, and between the two developments' dams as seasonally flooded, lower perennial riverine habitat with a rocky shore (R2RSC) and permanently flooded, upper perennial riverine habitat with a rock bottom (R2RBH).<sup>27</sup> NWI also indicates the presence of a 0.95-acre area of freshwater emergent wetland habitat north of the Lower Development powerhouse. Wetland habitat is more diverse in the eastern portion of the project

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<sup>27</sup> See National Wetlands Inventory mapping for Beaver Falls, New York <https://www.fws.gov/wetlands/data/mapper.html>.

boundary, with approximately 4 acres of palustrine emergent/shrub-scrub wetland habitat and over 2 acres of palustrine forested wetland habitat present (ASA-IA, 2016).

### **Invasive Species**

Targeted surveys for terrestrial invasive plant species were not conducted at the project as part of the applicant's 2014 surveys. However, as noted in the license application, over 150 species of non-native plants are present within Lewis County, including invasive plant species such as Japanese knotweed, common reed, and purple loosestrife (Weldy et al., 2018). Common buckthorn, various bush honeysuckle species, garlic mustard, and common barberry also occur in Lewis County and may be present within the project area.<sup>28</sup>

Although no aquatic invasive plant or animal species were incidentally documented during the applicant's surveys for fish, benthic macroinvertebrates, and water quality in 2014, Eurasian water milfoil is known to occur in the Black River Basin (Bergman Associates, 2010), and several other aquatic invasive plant species have been identified in the Adirondacks east of the project, including brittle naiad, European frogbit, and variable leaf milfoil.<sup>29</sup> Additionally, aquatic invasive bivalves such as Asian clam, zebra mussel, and quagga mussel, are known or suspected to occur in the Black River Basin (Bergman Associates, 2010).

### **Wildlife**

Wildlife species expected to use habitat available in the project area include species tolerant of human development and activity (i.e., raccoon, Virginia opossum, eastern cottontail rabbit, gray fox, gray squirrel, and various passerine bird species), game species such as white-tailed deer, and species that would use aquatic habitat within the Beaver River (i.e., various amphibian and waterfowl species, muskrat, and beaver). Extensive forest habitat of the Adirondack Park is located less than 10 miles east of the project boundary, and species present in the park (i.e., bobcat, coyote, black bear, fisher) could occur as transients within the project area where suitable habitat exists.

### **Bald Eagle**

The bald eagle (*Haliaeetus leucocephalus*) is protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act, which prohibit the "take" of eagle eggs, nests, and offspring, and can also include substantially disturbing normal

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<sup>28</sup> See <http://ccelewis.org/environment/invasive-plants>.

<sup>29</sup> See <https://www.dec.ny.gov/animals/50272.html>.

breeding and feeding activities, except as permitted by regulation. Bald eagles are listed as a threatened species in New York State and are protected under New York State law.

Bald eagles typically forage over water and other open habitats. Bald eagles nest in mature trees and snags and on cliffs, rocks, and artificial structures, generally within 1 mile of water. Nesting activity occurs from January through August.

Bald eagles have been observed within 0.4 mile of the project boundary during the breeding season.<sup>30</sup> Also, several bald eagle nests are documented to the west of the project in Jefferson County.<sup>31</sup> Since bald eagle breeding activity within New York State has been expanding since the 1980s, and suitable bald eagle breeding habitat exists within the project boundary, it is conceivable for bald eagles to nest within the project area during the term of any license that may be issued for the project.

### **3.3.3.2 Environmental Effects**

In SD1, Commission staff identified the effects of continued project operation and maintenance on botanical resources, wetlands, wildlife resources, and any state-listed species as resource issues. Also, construction of proposed enhancements to the existing small boat launch above the Upper Development would result in ground disturbance of an approximately 0.1-acre<sup>32</sup> area of previously disturbed, upland habitat along a state road.

The Commission did not receive substantive comments regarding the effects of project construction, operation, or maintenance on terrestrial resources. Therefore, staff analyzed the effects associated with Beaver Falls LLC's proposals for a Bat and Avian Protection Plan and Invasive Species Management Plan.

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<sup>30</sup> According to the Cornell Lab of Ornithology's eBird database (<http://ebird.org>) individual bald eagles were observed approximately 0.4 mile south of the project boundary on January 16, 2017, and approximately 2 miles west of the project boundary in February 2017. Also, these data indicate that numerous bald eagles have been observed within 5 miles of the project boundary during breeding and wintering seasons over the past decade.

<sup>31</sup> See [https://www.dec.ny.gov/docs/wildlife\\_pdf/baea2010.pdf](https://www.dec.ny.gov/docs/wildlife_pdf/baea2010.pdf).

<sup>32</sup> Estimated by staff, based on information provided in Beaver Falls LLC's Final Recreation Plan filed February 23, 2018.

## Bat and Avian Protection Plan

Beaver Falls LLC proposes to implement the Bat and Avian Protection Plan,<sup>33</sup> filed with the Settlement Agreement, to minimize project effects on bald eagles by: (1) notifying New York DEC and FWS within 30 days of the date of observation of a bald eagle nest within or immediately adjacent to the project boundary; and (2) limiting tree-clearing activity on project lands during certain periods (i.e., no tree clearing within 330 feet of a bald eagle nest from December 1 to June 30, and no construction within 660 feet of a bald eagle nest).

In a letter filed on April 5, 2018, Interior recommended that Beaver Falls LLC implement the Bat and Avian Protection Plan filed with the Settlement Agreement.

### *Our Analysis*

The proposed recreational enhancements upstream of the Upper Development would result in limited ground disturbance in the approximately 0.1-acre parcel, including the potential removal of trees and disturbance of previously disturbed habitat between State Highway 126 and the Beaver River. Also, both construction of the recreational enhancement and continued project maintenance may impact nesting bald eagles should this species become active within the project boundary.

However, consulting with FWS and New York DEC if bald eagles nest within or immediately adjacent to the project boundary, and incorporating measures to minimize habitat disturbance (such as those included in the proposed Bat and Avian Protection Plan) would minimize effects to bald eagles should a nest become active on project lands.

## Invasive Species Management Plan

Beaver Falls LLC's Invasive Species Management Plan, filed with the Settlement Agreement, includes measures to prevent the introduction and spread of terrestrial and aquatic invasive plant and animal species, such as: 1) employing best management practices (BMPs) during construction or maintenance, such as cleaning and drying boats that come into contact with water, training workers to identify and remove invasive plant and animal species from construction equipment before entering an invasive-free area, and use of invasive-free gravel, fill, erosion control material (i.e., straw or fiber rolls), and seed stock during replanting; and 2) providing informational signage on aquatic invasive plant and animal species and a self-use aquatic invasive species disposal station to be placed at the small boat launch above the Upper Development dam. However, as noted in section 1.1 of the plan, Beaver Falls LLC would not police or oversee any

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<sup>33</sup> Measures within this plan regarding the federally listed threatened northern long-eared bat are evaluated below in section 3.3.4, *Threatened and Endangered Species*.

activities performed by the public associated with invasive species management within the project boundary.

In a letter filed April 5, 2018, Interior recommends that Beaver Falls LLC implement the Invasive Species Management Plan filed with the Settlement Agreement.

### *Our Analysis*

Aquatic and terrestrial invasive plant and animal species are present within the Black River Basin, which includes the Beaver Falls Project. Construction of the proposed recreation enhancements, operation, maintenance, and project-related recreation could result in the introduction or spread of invasive species within the project boundary. However, employing measures to minimize the introduction and spread of invasive species during construction, operation, and maintenance, such as those included within the proposed Invasive Species Management Plan, would minimize the introduction or spread of invasive species within the project boundary. Also, the proposed measures in the plan to provide signage regarding aquatic invasive plant and animal species, and an aquatic invasive species disposal station at the small boat launch above the Upper Development, would help to minimize the introduction and spread of aquatic invasive species within the project boundary.

## **3.3.4 Threatened and Endangered Species**

### **3.3.4.1 Affected Environment**

FWS's IPaC system indicates one federally listed threatened species known to have the potential to occur in Lewis County: the northern long-eared bat.<sup>34</sup> No critical habitat for any federally listed threatened and endangered species occurs within project-affected lands.

#### *Northern long-eared bat*

FWS listed the northern long-eared bat as threatened on May 4, 2015 (FWS, 2015), and determined on April 27, 2016 that designating critical habitat is not prudent (FWS, 2016a).

The northern long-eared bat is a medium-sized bat species (3 to 3.7 inches in length) with longer ears than other species in the *Myotis* genus (FWS, 2015). The species' range includes 37 states, including most of the central and eastern United States,

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<sup>34</sup> See March 8, 2018 memorandum.

as well as the southern and central provinces of Canada, coinciding with the greatest abundance of forested areas.

The northern long-eared bat is found in a variety of forested habitats in the summer season. During this time, bats roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees. In the fall season, northern long-eared bats leave their forested habitat to hibernate in caves, mines, and other similar habitat. The bats arrive at hibernacula between August and September, enter hibernation between October and November, and emerge from hibernacula between March and April. Hibernacula and surrounding forest habitats play important roles in the bat's life cycle beyond the time when bats are overwintering, including for fall-swarming<sup>35</sup> and spring-staging<sup>36</sup> activities. Reproduction is limited to one pup per year in late spring. As such, bat populations can be slow to rebound from anthropogenic and naturally-occurring mortality events.

On January 14, 2016, FWS issued a final 4(d) rule that prohibits the following activities in areas of the country impacted by white-nose syndrome:<sup>37</sup> incidental take within a hibernation site; tree removal within 0.25 mile of a known, occupied hibernaculum; and cutting or destroying known occupied maternity roost trees, or any other trees within 150 feet of that maternity roost tree, during the pup-rearing season (June 1 through July 31) (FWS, 2016b). On January 5, 2016, FWS developed an optional streamlined consultation framework that allows federal agencies to rely on a

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<sup>35</sup> Fall-swarming fills the time between summer and winter hibernation. The purpose of swarming behavior may include: introduction of juveniles to potential hibernacula, copulation, and gathering at stop-over sites on migratory pathways between summer and winter regions.

<sup>36</sup> Spring-staging is the time period between winter hibernation and migration to summer habitat. During this time, bats begin to gradually emerge from hibernation and exit the hibernacula to feed, but re-enter the same or alternative hibernacula to resume daily bouts of torpor (i.e., a state of mental or physical inactivity).

<sup>37</sup> White-nose syndrome is the main threat to the northern long-eared bat, and has caused a precipitous decline in bat numbers (in many cases, 90 to 100 percent) where the disease occurs.

programmatic biological opinion on FWS's final 4(d) rule to fulfill section 7(a)(2) consultation requirements for northern long-eared bat (FWS, 2016c).<sup>38</sup>

The Beaver Falls Project is located in Lewis County, which is within the white-nose syndrome zone and the northern long-eared bat species range (FWS, 2017b; FWS, 2018). There are no known summer or winter occurrences of northern long-eared bats within the project boundary. However, there are confirmed summer occurrences of northern long-eared bats in Lewis County (north of the project in the Town of Diana, and west of the project in the Town of Denmark), and the closest known winter occurrences are northwest of the project in Jefferson County (towns of Watertown and Brownville, New York) (FWS, 2016e; New York DEC 2018).

### **3.3.4.2 Environmental Effects**

Although New York DEC and FWS records indicate there are no northern long-eared bat hibernacula or maternity roosts known to occur within the project boundary, project lands may provide suitable summer roosting and feeding habitat for the species. Construction of recreational enhancements at the small boat launch upstream of the Upper Development and routine maintenance in the project boundary could involve the removal of trees, which may remove potential summer roosting habitat used by northern long-eared bats.

The proposed Bat and Avian Protection Plan filed with the Settlement Agreement includes requirements that Beaver Falls LLC would maintain a minimum distance of 150 feet from a known occupied maternity roost tree during pup season (June 1 through July 31) and a minimum of 0.25 mile from any known occupied hibernacula. The plan also requires Beaver Falls LLC to consult with New York DEC and FWS if tree clearing is required within these distances; any trees that are a threat to human life or property

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<sup>38</sup> FWS developed a key to help federal agencies determine if they can rely on the streamlined section 7 consultation in the 4(d) rule, or if their actions may cause prohibited incidental take that requires separate section 7 consultation (FWS, 2016d). FWS's key considers whether the federal action: (1) may affect the northern long-eared bat; (2) involves the purposeful take of northern long-eared bats; (3) is located inside the white-nose syndrome zone; (4) will occur within a hibernaculum or alter the entrance/environment of a hibernaculum; (5) involves tree removal; (6) involves the removal of hazardous trees; and (7) includes (a) the removal of an occupied maternity roost tree or any trees within 150 feet of a known occupied roost tree from June 1 through July 31, or (b) the removal of any trees within 0.25 mile of a hibernaculum at any time of year.

(hazard trees) may be removed, although Beaver Falls LLC would need to consult with New York DEC and FWS if any bats are observed.

In a letter filed April 5, 2018, Interior states that “any take that may occur incidental to this [p]roject is not prohibited under the final 4(d) rule” and that “no further ESA coordination or consultation is required at this time.”

### *Our Analysis*

Seasonal avoidance of tree clearing activity from June 1 through July 31, consultation with New York DEC and FWS regarding any tree-clearing activities occurring outside of this period, and reporting observations of northern long-eared bats during any removal of hazard trees, is likely to minimize effects to this species. We also conclude that, while construction of the proposed recreation enhancements and continued operation and maintenance of the project may affect the northern long-eared bat, any incidental take that may result from these activities is not prohibited by the final 4(d) rule.

## **3.3.5 Recreational Resources**

### **3.3.5.1 Affected Environment**

#### Local and Regional Recreation Opportunities

The Beaver River Canoe Trail is a 14-mile long canoe route that begins at the Beaver River Project’s Moshier Falls Development powerhouse nearly 20 river miles upstream of the Upper and Lower developments. The canoe trail includes portages around 6 dams and passes through multiple reservoirs before ending about 6 miles upstream of the project. The canoe trail can be paddled in a day or can be made into a multi-day camping and paddling trip along the Beaver River (Outdoor Project, 2018). There is also a canoe and kayak launching site along the Beaver River within the Town of Croghan, approximately 2 miles upstream of the Upper Development dam.<sup>39</sup>

Several parks and waterfalls are located within 30 miles of the project. About 15 miles south of the developments is Whitaker Park, which is owned and operated by the Town of Martinsburg. The park has 44 campsites, two pavilions, waterfalls, picnic sites, and offers swimming and hiking opportunities (Whitaker Park, 2018). Singing Waters Park, owned and operated by Lewis County, is about 20 miles south of the developments and is located on a 105-acre tract that was reforested in the 1960’s. Fish Creek runs through the park and the park includes two picnic areas for up to 130 people. Overnight camping is also permitted (Adirondacks Tug Hill, 2018). About 30 miles south of the

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<sup>39</sup> See <https://parks.ny.gov/recreation/boating/launch-sites.aspx#sthash.bmEJv2AQ.dpuf>.

developments is the Agers Falls Recreational and Historical Area, which is owned and operated by FortisUS Energy Corporation. The site is located on the Moose River and includes an unpaved parking lot, a boat launch, a picnic/swim area, a historical pavilion, and a hiking trail. The site is typically open from May through October, depending on weather conditions (Northern New York Waterfalls, 2018).

Lewis County maintains an extensive county-wide ATV (all-terrain vehicle) Trail System that includes county lands and private landowner trails. The ATV Trail System is funded through permits sold to ATV owners, which covers the costs of establishing and maintaining the ATV Trail System, funds the development of new ATV trails, and assists in the opening of roads to improve ATV access in Lewis County. The ATV Trail System is monitored by the Lewis County Sheriff's Department. The system is maintained and developed by the Lewis County Recreation, Forestry, and Parks trail crew and volunteers from the Highmarket Wheelers ATV Club, the Tug Hill Adirondack ATV Association, and the Tug Hill Wheelers Club. The trails are typically open from April through mid-October depending on weather conditions (Lewis County, 2018).

The Whetstone Gulf State Park is located about 15 miles south of the developments. It is built in and around a three-mile-long gorge cut into the eastern edge of the Tug Hill Plateau. The park has 56 wooded campsites, a scenic picnic area along Whetstone Creek, a swimming area, and trails for hiking and cross-country skiing. Above the gorge is Whetstone Reservoir, which is stocked with tiger muskie and largemouth bass, and is a popular canoeing location (New York State Office of Parks, Recreation, and Historic Preservation, 2018).

### **Project Recreation**

Beaver Falls LLC owns and maintains two public access sites on the north and south side of the reservoir just upstream of the Upper Development dam. Access is provided on the north side of the river at the swim beach area adjacent to the dam. This site includes a designated swimming area, porta-john, pavilion, picnic area, playground, concrete basketball court, swimming raft/dock, and a lifeguard stand. Beaver Falls LLC maintains an annual lease agreement with the Beaver River Recreation Association (Recreation Association) to maintain the swim beach area. The swim beach area is typically open to the public from May 1 through September 30. The Recreation Association is responsible for refuse removal, maintenance of signage and fencing, the porta-john, and an on-duty lifeguard during posted open hours. Physical maintenance is normally provided by the Recreation Association, but Beaver Falls LLC provides occasional maintenance assistance.

The small boat launch, located above the dam on the southern shore of the river, is operated and maintained by Beaver Falls LLC and is only adequate for boats that can be hand-carried. This launch area, which also serves as the canoe take-out site, includes an

informal shoreline area where recreational boaters can launch or remove hand-carried boats from the river. Based on its size, one to two boats could occupy the width of the unpaved launch area. The shoreline area at the launch site provides some fishing access to the southern shore of the river.

Currently, the only available parking near the small boat launch is roadside along State Highway 126. A parking area does not exist at this location because of limited space between State Highway 126 and the small boat launch, and a 60 degree decline down to the launch area. Thus, recreational boaters park along State Highway 126 and walk down a steep hillside to access the boat launch. Public shoreline access between the two developments is limited due to the steep nature of the terrain and private lands adjacent to the project; therefore, canoe portage to the Lower Development is not feasible. While public access is allowed at the Lower Development, there are no formal recreation access areas there.

### **Recreation Use**

Recreation use at the project was most recently monitored in 2014 and reported through the 2015 FERC Form 80<sup>40</sup> filed with the Commission.<sup>41</sup> Beaver Falls LLC indicated daytime use at the project was approximately 1,283 recreation days per year.<sup>42</sup> The peak weekend (i.e., Memorial Day, July 4<sup>th</sup>, or Labor Day) average recreation use was approximately 57 recreation days over a three-day holiday weekend. Beaver Falls LLC reported that the swim beach area received approximately 95 percent of the total use of recreation facilities within the project boundary. And the overall recreation use, with the highest observation of 50 percent use at the swim beach area, is well below the capacity of the site.

#### **3.3.5.2 Environmental Effects**

The Settlement Agreement modifies the proposed Recreation Plan filed with the license application. The Settlement Agreement includes a provision for Beaver Falls LLC to provide a boat launch, fishing access, canoe take-out, and parking area within 3

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<sup>40</sup> To evaluate recreation resources at the project, the Commission requires the licensee to prepare and submit a FERC Form 80 every 6 years (*see* 18 C.F.R. § 8.11). Each FERC Form 80 must identify the project's recreation facilities and the level of public use of these facilities.

<sup>41</sup> Beaver Falls LLC filed the 2015 FERC Form 80 on May 19, 2015.

<sup>42</sup> Form 80 defines a recreation day as each visit by a person to a development for recreational purposes during any portion of a 24-hour period.

years of license issuance, at a location to be determined in consultation with New York DEC and FWS. On February 23, 2018, Beaver Falls LLC filed a Final Recreation Plan that includes more detail regarding the recreation measures mentioned in the Settlement Agreement. The Final Recreation Plan includes the following measures: (1) upgrading the small boat launch<sup>43</sup> on the southern shore of the Beaver River above the Upper Development dam within 3 years of license issuance by (a) removing trees to allow for easier launching and retrieval of small boats and canoes, (b) creating a parking area for three to four vehicles and hand-carried boat trailers, and (c) improving road access to the site; (2) providing facility and sign maintenance at the swim beach area; (3) maintaining a lease agreement for the swim beach area; and (4) installing “end of canoe trail” signage at the small boat launch.

As described in the Final Recreation Plan, within 1 year of any license issued Beaver Falls LLC would construct and install signage at the swim beach area and the canoe trail, and secure the annual lease agreement with the Recreation Association. The swim beach area signage would include a map, the project number, and a statement that the site is open to the public. Additional general safety signage would also be installed at the project. Within the second year after any license is issued, Beaver Falls LLC would start construction of the enlarged small boat launch and the shoreline fishing area at the Upper Development. Within the third year after any license is issued, Beaver Falls LLC would provide a gravel access road, parking area, and signs directing the public to the small boat launch and shoreline fishing area.

Beaver Falls LLC maintains an annual lease agreement with the Recreation Association for the summer recreation months to provide public access at the swim beach area. The lease agreement specifies who is responsible for utilities, maintenance, repairs, expenses, and liabilities among other details. Beaver Falls LLC proposes to continue leasing the swim beach area to the Recreation Association.

Beaver Falls LLC proposes to install “end of canoe trail” signage at the small boat launch to alert paddlers that there is no portage available around the project. While multiple portages exist upstream of the project, Beaver Falls LLC states that creating a portage around its dams would be difficult due to the presence of steep terrain and adjacent private landowners to project lands.

In its April 5, 2018 letter, Interior recommends that the Commission include a recreation management plan article in any license issued that would require, within 3 years of license issuance, that Beaver Falls LLC provide signage, a boat launch, fishing

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<sup>43</sup> In a memo filed August 23, 2018, Beaver Falls LLC confirmed that the small boat launch, following the proposed enhancements, would continue to be used solely for launching hand-carried boats (i.e., canoes and kayaks).

access, a canoe take-out, and a parking area to be determined in consultation with the New York DEC and FWS.

### *Our Analysis*

The swim beach area and small boat launch for hand-carried boats provide two public access areas for the local community to recreate at the project. The proposed measures at the small boat launch including tree removal, a new parking area, and road improvements would enhance access to the site. The removal of trees would widen the area used to access the river and would provide a more visible entrance/exit to the reservoir for those launching and removing their canoes and kayaks from the water. Creating a parking area that accommodates three to four vehicles and hand-carried boat trailers would provide an improvement to the existing roadside parking that is currently the only option for the public near this site. A new parking area in the vicinity of the small boat launch would provide a safe area for loading and unloading hand-carried boats. Decreasing the number of cars attempting to park on the side of the highway provides a safety enhancement for both oncoming traffic as well as cars coming up from behind the vehicles pulling off the highway to park along the road. The new gravel access road would connect the highway to the parking area. This connector road would provide traffic turning off of the highway a direct means of access to the parking area.

Installing additional signage would enhance the access areas by displaying information related to the recreation sites at the project for the public. Signs keep the public informed about recreational opportunities at the project as well as provide proper safety instructions. The “end of canoe trail” signage would provide a clear indication to paddlers on the Beaver River that the canoe trail does not continue and that there is no portage available from the Upper Development to access the Lower Development or points further downstream. In order to ensure proper upkeep of the two recreation areas and various signs at both sites, Beaver Falls LLC’s provision of facility and sign maintenance would provide a mechanism for repairs to occur when needed.

While Beaver Falls may enter into a lease agreement with another entity for the operation of the swim beach area, the responsibility of providing recreation access at both recreation sites would ultimately lie with Beaver Falls LLC for the term of any license issued. The provision of public access to the swim beach area would ensure that the public continues to have the opportunity to enjoy the benefits of a swim beach, playground, picnic amenities, and basketball court.

A recreation management plan, such as the February 23, 2018, Final Recreation Plan filed by Beaver Falls LLC, would provide guidance on the recreation measures that Beaver Falls LLC proposes at the project. It would clearly describe the enhancements to the public access sites and would provide a construction schedule for completion of those

enhancements. A recreation management plan would also incorporate consultation with stakeholders to identify current and future needs as they arise.

### **3.3.6 Cultural Resources**

#### **3.3.6.1 Affected Environment**

Section 106 of the NHPA requires the Commission to evaluate potential effects on properties listed or eligible for listing in the National Register prior to an undertaking. In this case, the undertaking is the issuance of a subsequent license for the combined Beaver Falls Project. Project-related effects could be associated with the operation and maintenance of the existing project.

Historic properties are defined as any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. Traditional cultural properties are a type of historic property eligible for the National Register because of their association with cultural practices or beliefs of a living community that are: (1) rooted in that community's history; or (2) important in maintaining the continuing cultural identity of the community. In this EA, we also use the term cultural resources to include properties that have not been evaluated for eligibility for listing in the National Register. In most cases, cultural resources less than 50 years old are not considered eligible for the National Register.

Section 106 also requires that the Commission seek concurrence with the New York SHPO on any finding involving effects or no effects on historic properties and allow the Advisory Council on Historic Preservation (Advisory Council) an opportunity to comment on any finding of effects on historic properties. If Native American properties have been identified, section 106 requires that the Commission consult with interested Native American Tribes that might attach religious or cultural significance to such properties.

On January 23, 2013, the Commission designated Beaver Falls LLC as the non-federal representative for carrying out day-to-day consultation regarding the licensing efforts pursuant to section 106 of the NHPA. However, the Commission remains largely responsible for all findings and determinations regarding the effects of the proposed project on any historic property, pursuant to section 106.

#### Area of Potential Effect

Pursuant to section 106 of the NHPA, the Commission must take into account whether any historic property could be affected by a new license within the project area of potential effect (APE). The APE is defined as the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use

of historic properties, if any such properties exist. The APE for this project is all lands within the project boundary (including the Upper and Lower developments) and any lands outside of the project boundary where cultural resources may be affected by project-related activities.

### Cultural Historic Overview

The earliest European contact in the region took place in the mid-seventeenth century when the French explorer Simon LeMoynes made contact with the Onondagas at what is now Syracuse. The seventeenth and eighteenth centuries were particularly tumultuous in the region, as England and France jockeyed for political, military, and economic dominance in the region and involved various parts of the Haudenosaunee and other Indian nations and tribes in different alliances. In 1788 leaders of the Oneida Nation, a member of the Haudenosaunee Confederacy, were persuaded to convey its claim to property in what is now Lewis County at the Treaty of Fort Stanwix. The State of New York sold approximately 3.5 million acres of this land, including what is now Beaver Falls, to Alexander Macomb, William Constable, and Daniel McCormick in 1792. Later in the decade Constable sold approximately 450,000 acres of this land, including Beaver Falls, to a group of French investors. Agents of the French investors surveyed the land and platted the city of Castorville, at the present location of Beaver Falls. While a group of French settlers traveled to the region and built a small sawmill at the location, the climatic conditions proved insurmountable, and they returned to France soon after Napoleon took power in the early nineteenth century.

In the 1830s, settlers from eastern New York and New England moved into the Beaver River valley, and began purchasing land surrounding Beaver River Falls from James LeRay, who had bought the land from the French investors. The falls provided a natural source of water power, and these new settlers soon began building saw mills that could process the seemingly endless timber from the surrounding forests. There was a saw mill on the north bank of the river at the falls by the late 1830's, and one on the south side by the early 1850's. In 1852 Hiram Lewis built a tannery on the south side of the falls. Lewis then sold the tannery to his son-in-law, Martin LeFevre. Lewis's son, James Polk (J.P.) Lewis arrived in Beaver Falls in 1871 to help his brother-in-law run the tannery. J.P. Lewis and Martin LeFevre then joined with another in-law, Charles Nuffer, to build a pulp mill at the site in 1880, processing wood into pulp for use in paper production; Lewis took sole control of the company in 1883. This became the basis for J.P. Lewis's pulp and paper empire based in Beaver Falls, a firm that remained in the Lewis family into the 1970s.

Lewis was involved in several companies in Beaver Falls and the surrounding area, including the J.P. Lewis Company and Lewis, Slocum and LeFevre, all of which had mills for lumber and pulp along the Beaver River. Other companies also operated along the Beaver River in and around Beaver Falls, including ones owned by Theodore

Basselin, a lumber magnate in the region with plants throughout Lewis and Jefferson counties. Basselin operated a pulp mill on the south side of the Beaver River and several sawmills in the area; he eventually became the leading employer in Croghan. Lewis, Slocum and LeFevre built a pulp mill where the current Upper Development powerhouse is now located. The firm then constructed a trestle in the Beaver River that carried pulp to one of Basselin's paper mills on the north side of the river. Portions of the trestle remain in the river, immediately downstream of the current powerhouse.

All of these paper and pulp mills required extensive power, which was provided by the flowing water of the Beaver River. The plants initially ran on hydromechanical power, using a dam constructed of timber which Lewis built in the 1880's. In 1918, after the original timber dam gave out, Lewis, Slocum and LeFevre had a new 500-foot-long concrete dam and a new log sluice built at their pulp mill. Walter Bradley Construction Company, in Fulton, New York built the dam under the direction of R.H. Brown, engineer for the J.P. Lewis Company. The log sluice was removed in the early 1950s, but the dam remained intact. An earlier dam was built just downstream of this original upper dam, and provided power for the paper mill on the north bank and another pulp mill on the south bank.

As important as these dams were to Beaver Falls, they were capable of providing only a portion of the power that the paper and pulp mills required in the early twentieth century. The rivers of Lewis and Jefferson counties were increasingly developed for hydroelectric power in the first three decades of the twentieth century. Hydroelectric plants were being developed along the Salmon, Black, Beaver, and other rivers in the region in order to provide power to manufacturing interests both in the North Country and particularly in the Mohawk River valley. Throughout the late nineteenth and early twentieth centuries many independent firms and individuals took advantage of the new hydroelectric technology to build small and mid-size generating plants. By the 1910s and 1920s many of these plants were acquired by ever-larger companies in an attempt to regularize an electric power grid and support ever-larger industrial plants. The forests of northern New York provided ample materials for pulp and paper factories, and the new power plants were intimately tied to this industry. In 1913, a group of Watertown, New York investors headed by John Bryon Taylor, the son-in-law of Governor Russell B. Flower, formed Northern New York Utilities, Inc.

The J.P. Lewis Company was one of the independent operators that built hydroelectric power plants in the North Country. The company's principal plant was the Eagle Falls hydroelectric plant on the Black River in Watson, approximately 15 miles south of Beaver Falls. The hydroelectric plant contained three turbines, with room for a fourth unit. A transmission line brought power to Lewis' Beaver River Company plant in Beaver Falls. In 1923, Northern New York Utilities, Inc. purchased the Eagle Falls hydroelectric plant from the J.P. Lewis Company.

Northern New York Utilities, Inc. was only one part of the wave of hydroelectric consolidation in the early twentieth century. An even larger organization emerged at the same time, the Niagara Hudson Power Company, later renamed the Niagara Mohawk Power Company. After the J.P. Lewis Company sold its Eagle Falls plant to Northern New York Utilities, Inc., the company retained the High Falls hydroelectric plant on the Beaver River, approximately 4 miles upstream of Beaver Falls. J.P. Lewis sold the electricity to Niagara Hudson, which powered Lewis' paper and pulp mills at Beaver Falls. In 1931, the J.P. Lewis Company purchased the Lewis, Slocum and LeFevre Company, Inc., which operated the pulp mill at the south end of the upper dam. The property, according to the newspaper report, included a ground wood pulp mill, with a capacity of 20 tons per day, along with the water power rights. At the same time that the J.P. Lewis Company announced the sale, it suggested that it might start a hydroelectric development in Beaver Falls, using the existing upper dam.

J.P. Lewis Company took several years to develop the plans and financing during the depression for the new hydroelectric station. In 1937, the company demolished the former Lewis, Slocum and LeFevre pulp mill to prepare the site. No written records, including newspaper reports, were identified for the construction of the current powerhouse at the Upper Development. However, a series of photographs donated to Beaver Falls LLC provide important information about the process of construction. Portions of the earlier pulp mill remained in place while the intake was constructed. Once the concrete intake structure was built, the remaining portions of the pulp mill were removed and the ground excavated, leaving the stone foundation intact, and the concrete foundation for the powerhouse was built. The powerhouse and intake were completed in 1938, when the plant went online.

The original intake structure for the Upper Development powerhouse was located at the southwestern end of the dam. In 1981, when the current Lower Development was constructed at approximately 500 feet downstream of the original Upper Development powerhouse, the original intake was filled in with concrete. In its place, a new concrete intake structure was constructed adjacent to the original intake by breaking through the line of the dam and creating a larger concrete penstock structure that extends above the ground downstream of the face of the dam.

According to the National Register, Lewis County has 24 registered historic places, three of which are in the vicinity of the Beaver Falls Project. The Croghan Island Mill, which is upstream of the project on the Beaver River, is the only surviving water-powered mill in New York State, and has been in operation for over 150 years. The mill was listed in the National Register on July 30, 2010. The Harry and Molly Lewis House is an architecturally historic site that was listed on November 21, 2012. It consists of a single residence and outbuildings that were once owned by the locally prominent Lewis family. The third site, the Beaver Falls Grange Hall was listed on December 1, 2015. This site was built in 1892 and served as a village meeting hall.

## **Cultural Resources Investigations**

### Archaeological Resources

Beaver Falls LLC completed an Archaeological Shoreline Monitoring Survey in 2017 to gather relevant information regarding cultural resources in and around the APE. The archaeological survey included a visual inspection of both sides of the 600-foot-long Lower Development shoreline and each bank of the Upper Development shoreline. Photos were taken at multiple spots along both shorelines to document existing conditions. The photos taken during this survey created a baseline photo record of the condition of the river bank for comparison purposes of future shoreline monitoring efforts. The photos showed that the bank is well protected from erosion by natural vegetation and rocks. There is very little recreational traffic on either reservoir and there are no launches for motorized boats at either development.

Literature and archive research was conducted using the New York Cultural Resource Information System (CRIS) database, which is maintained by the New York SHPO. The CRIS database included three sites listed in the National Register near the projects: the Croghan Island Mill (listed July 30, 2010), the Harry and Molly Lewis House (listed November 21, 2012), and the Beaver Falls Grange Hall (listed December 1, 2015). However, the CRIS database had no pre-European contact archaeological sites reported near the developments and no archaeological surveys have been conducted near the project area. Thus, the potential for the existence of archaeological sites near the project has not been established.

The report concluded that there was essentially no shoreline erosion occurring at the project. In addition, there were no known archaeological sites along the banks at either development, therefore, the assessment concluded that no cultural resource sites were affected by operation of the project. The recommendation from the report included an inspection of the shoreline in 5 years and, if no changes were discovered, the need for future shoreline inspections should be reexamined.

### Architectural and Historical Resources

Beaver Falls LLC completed a Historical Architectural Survey in 2016 to gather relevant information regarding cultural resources in and around the APE. Specifically, the purpose was to identify any above-ground historic resources within the APE and to evaluate these resources for their eligibility for inclusion in the National Register. The survey included a pedestrian inspection of all potential historic architectural resources within the APE. The field survey included physically inspecting each historic architectural resource identified within the APE, and taking written notes regarding architectural styles and details, construction materials, and the integrity of historical materials. In addition, overview and detail photographs of each resource were taken and

research was conducted on each resource. According to the CRIS database, no cultural resources have been identified within the APE. However, two above-ground historic resources within one-quarter of a mile of the APE have been listed in the National Register. The Harry and Molly Lewis House and Beaver Falls Grange Hall have not been affected by current operation and the survey determined that relicensing the project would not affect these historic properties.<sup>44</sup>

The one historic architectural resource identified within the APE was the Upper Development. The research conducted on the Upper Development included an examination of local history sources, including maps, deeds, and secondary sources, to evaluate the significance of the Upper Development in its historic context. The dam at the Upper Development was constructed in 1918, while the powerhouse was constructed in 1938. Even though they remain in their original footprint, they have both been altered. The most substantial change to the Upper Development occurred in 1981 when the Lower Development was constructed. At the Upper Development, a new intake gate and penstock structure were built, which included removal of part of the dam. The original intake was filled with concrete. The new intake structure is larger than the original, and extends downstream to the new concrete penstock. The penstock is above-ground, which adds a modern visual element to the original relationship between the dam and the powerhouse. The dam was also renovated with post-tension anchors and a new concrete surface.

With the exception of the one-story addition on the east side of the powerhouse to house the incoming penstock, the powerhouse retains its original footprint. No original photos exist to show the exterior of the powerhouse, but the cladding and the glass block windows appear to be original. The generating equipment, while original, was extensively overhauled in 2006. At that time, the original governor and oil tank, and the entire electrical control system, were replaced with modern equipment.

#### Traditional Cultural Properties

By letters issued November 14, 2011, October 22, 2012, and February 4, 2016, the Commission initiated consultation with the Cayuga Nation of New York, Oneida Nation of New York, Onondaga Nation of New York, Saint Regis Mohawk Tribe, Seneca Nation of New York, Tonawanda Band of Seneca Indians of New York, Tuscarora Nation of New York, Seneca-Cayuga Nation, and Oneida Tribe of Indians of Wisconsin.

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<sup>44</sup> The Croghan Island Mill, which is also listed in the National Register, is 3 miles upstream of the project; it was not discussed in the architectural survey most likely due to its distance from the APE.

No responses to these letters were received and no consulted Tribes have reported any known traditional cultural properties within the APE of the project.

### **3.3.6.2 Environmental Effects**

Beaver Falls LLC was designated the non-federal representative to initiate section 106 consultation with the New York SHPO in a notice issued by the Commission on January 23, 2013. Even though the presence of archaeologically significant resources at the project was not likely, as part of the relicensing process, Beaver Falls LLC was directed by the New York SHPO to complete an archaeological survey and a historic architectural survey. The surveys identified three National Register listed sites near the projects; however, the surveys concluded that project operation does not currently nor would future operation have an effect on these historic properties. In its comment letter dated August 8, 2017, which was attached to the survey reports filed on January 9, 2018, the New York SHPO concurs with the findings of both surveys. In the comment letter from the New York SHPO, the recommendation is for Beaver Falls LLC to conduct another archaeological survey in 5 years. The New York SHPO did not recommend the Upper Development as eligible for listing in the National Register. In a letter filed July 9, 2018, the New York SHPO determines that no historic properties would be affected by relicensing with the condition that the shoreline be inspected again in 5 years to determine if any changes occurred during that period. The New York SHPO states that if no changes to the shoreline were found, the need for further shoreline evaluations should be reconsidered.

In the Settlement Agreement, Beaver Falls LLC states that it would develop an HPMP in consultation with the New York SHPO and in accordance with the Guidelines for the Development of Historic Properties Management Plans for FERC Hydroelectric Projects. The HPMP would include provisions for monitoring known archaeological resources and for continued coordination and consultation with the New York SHPO throughout the term of the license.

#### *Our Analysis*

During the recent archaeological survey, no archaeological resources were discovered in the APE; therefore, relicensing the project would have no effect on archaeological resources. Conducting future archaeological surveys, as proposed by Beaver Falls LLC and recommended by the New York SHPO, could allow Beaver Falls LLC to compare survey results and report any changes in shoreline condition and/or the discovery of archaeological resources to the Commission and the New York SHPO. However, because no archaeological resources were discovered at the project, and the proposed strict run-of-river operation would limit reservoir fluctuations, there is no indication that the shoreline would be affected by project operation. Requiring Beaver

Falls LLC to conduct future surveys would not likely reveal undiscovered archaeological resources, although Beaver Falls LLC could choose to conduct such surveys voluntarily.

During the term of any license issued, archaeological or historic resources could be discovered during project-related activities that require ground disturbance. To ensure the proper treatment of any potential archaeological or cultural resources that may be encountered, it would be reasonable for Beaver Falls LLC to notify the Commission and the New York SHPO and discontinue all ground-disturbing activities until it can be determined whether any measures are needed.

The architectural survey indicates that while the Upper Development was constructed over 50 years ago, it has been altered considerably and does not meet the eligibility criteria for listing in the National Register. No other architecturally significant resources were identified within the APE. There are no project effects on archaeologically or architecturally historic cultural resources near the project. Thus, relicensing the projects would not affect archaeological or architectural resources.

Typically, an HPMP is developed and implemented by a licensee to avoid, mitigate, or lessen the impacts of new construction or project operation that could have an adverse effect on historic resources. After review of both cultural resource surveys, staff concludes that there would be no effect on cultural resources. Since the New York SHPO and staff have determined that there would be no effect on cultural resources, it would not be necessary for Beaver Falls LLC to develop an HPMP.

### **3.4 NO-ACTION ALTERNATIVE**

Under the no action alternative, the two project developments would continue to operate as individual projects (Upper Beaver Falls and Lower Beaver Falls Hydroelectric projects) in their current manner. None of the measures proposed by the licensee would be required. Minimum flows would remain as they exist from both project dams. Improvements to trash racks to minimize entrainment and impingement would not be carried out, and improvements to existing recreational facilities upstream of the Upper Beaver Falls Hydroelectric Project would not be constructed.

## **4.0 DEVELOPMENTAL ANALYSIS**

In this section, we look at the proposed project's use of the Beaver River for hydropower purposes to see what effect various environmental measures would have on the project's costs and power generation. Under the Commission's approach to

evaluating the economics of hydropower projects, as articulated in *Mead Corp.*,<sup>45</sup> the Commission compares the current project cost to an estimate of the cost of obtaining the same amount of energy and capacity using a likely alternative source of power for the region (cost of alternative power). In keeping with Commission policy as described in *Mead*, our economic analysis is based on current electric power cost conditions and does not consider future escalation of fuel prices in valuing the hydropower projects' power benefits.

For each of the licensing alternatives, our analysis includes an estimate of: 1) the cost of individual measures considered in the EA for the protection, mitigation, and enhancement of environmental resources affected by the project; 2) the cost of alternative power; 3) the total project cost (i.e., for operation, maintenance, and environmental measures); and 4) the difference between the cost of alternative power and total project cost. If the difference between the cost of alternative power and total project cost is positive, the project produces power for less than the cost of alternative power. If the difference between the cost of alternative power and total project cost is negative, the project produces power for more than the cost of alternative power. This estimate helps to support an informed decision concerning what is in the public interest with respect to a proposed license. However, project economics is only one of many public interest factors the Commission considers in determining whether, and under what conditions, to issue a license.

#### **4.1 POWER AND DEVELOPMENTAL BENEFITS OF THE PROJECT**

Table 10 summarizes the assumptions and economic information we use in our analysis. This information, except as noted, was provided by Beaver Falls LLC in its license application and subsequent submittals. We find that the values provided by the applicant are reasonable for the purposes of our analysis. Cost items common to all alternatives include: taxes and insurance costs; net investment (the total investment in power plant facilities to be depreciated); estimated future capital investment required to maintain and extend the life of plant equipment and facilities; relicensing costs; and normal operation and maintenance cost. Commission fees do not apply to the no-action alternative, and but are common to the other alternatives.

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<sup>45</sup> See *Mead Corporation, Publishing Paper Division*, 72 FERC ¶ 61,027 (1995). In most cases, electricity from hydropower would displace some form of fossil-fueled generation, in which fuel cost is the largest component of the cost of electricity production.

Table 10. Parameters for economic analysis of the Beaver Falls Project (Sources: Beaver Falls LLC and staff).

<b>Parameter</b>	<b>Value</b>
Period of analysis (years)	30
Term of financing (years)	20
Federal income tax rate (percent) <sup>a</sup>	21.00
Local tax rate (percent) <sup>a</sup>	3.00
Energy value (\$/MWh) <sup>b</sup>	29.60
Capacity value (\$/kilowatt-year) <sup>b</sup>	195
Interest rate (percent) <sup>a</sup>	8.00
Discount rate (percent) <sup>a</sup>	8.00
Net investment <sup>c</sup>	\$2,071,054
Operation and maintenance (\$/year) <sup>d</sup>	\$457,194
Commission fees (\$/year) <sup>e</sup>	\$14,935

<sup>a</sup> Assumed by staff.

<sup>b</sup> Based on the Energy Information Administration's 2017 Annual Energy Outlook.

<sup>c</sup> Remaining undepreciated net investment and relicensing cost. Value provided by the applicant was updated to 2018 by staff.

<sup>d</sup> Includes insurance and general administrative costs. Value provided by the applicant was updated to 2018 by staff.

<sup>e</sup> Estimated by staff.

## 4.2 COMPARISON OF ALTERNATIVES

Table 11 compares the installed capacity, annual generation, cost of alternative power, estimated total project cost, and difference between the cost of alternative power

and total project cost for each of the alternatives considered in this EA: no action, the Beaver Falls LLC’s proposal, and the staff alternative.

Table 11. Summary of the annual cost of alternative power and annual project cost for the alternatives for the Beaver Falls Project (Source: staff).

	<b>No Action</b>	<b>Beaver Falls LLC’s Proposal</b>	<b>Staff Alternative</b>
Installed capacity (MW)	2.5	2.5	2.5
Annual generation (MWh)	14,302	13,296	13,296
Annual cost of alternative power (\$/MWh)	\$803,630 56.19	\$773,830 58.20	\$773,830 58.20
Annual project cost (\$/MWh)	\$720,300 50.36	\$857,630 64.50	\$849,670 63.90
Difference between the cost of alternative power and project cost (\$/MWh)	\$83,330 5.83	(\$83,800) (6.30)	(\$75,840) (5.70)

#### 4.2.1 No-action Alternative

Under the no-action alternative, the Upper and Lower Beaver Falls Hydroelectric projects would continue to operate as they do now. With a combined installed capacity of 2.5 MW, the projects generate an average of 14,302 MWh of electricity annually. The average annual cost of alternative power would be \$803,630, or about \$56.19/MWh. The average annual project cost would be \$720,300, or about \$50.36/MWh. Overall, the projects would produce power at a cost that is \$83,330, or \$5.83/MWh, less than the cost of alternative power.

#### 4.2.2 Applicant’s Proposal

Based on a total installed capacity of 2.5 MW and an average annual generation of 13,296 MWh, the cost of alternative power would be \$773,830, or about \$58.20/MWh. The average annual project cost would be \$857,630, or \$64.50/MWh. Overall, the

combined project would produce power at a cost that is \$83,800, or \$6.30/MWh, more than the cost of alternative power.

### **4.2.3 Staff Alternative**

The staff alternative would have the same capacity and energy attributes as the applicant's proposal. Table 12 presents the staff-recommended additions, deletions, and modifications to the applicant's proposed environmental protection and enhancement measures and the estimated cost of each.

Based on a total installed capacity of 2.5 MW and an average annual generation of 13,296 MWh, the cost of alternative power would be \$773,830, or about \$58.20/MWh. The average annual project cost would be \$849,670, or \$63.90/MWh. Overall, the combined project would produce power at a cost that is \$75,840, or \$5.70/MWh, more than the cost of alternative power.

## **4.3 COST OF ENVIRONMENTAL MEASURES**

Table 12 gives the cost of each of the environmental enhancement measures for the project considered in our analysis. We convert all costs to equal annual (levelized) values over a 30-year period of analysis to give a uniform basis for comparing the benefits of a measure to its cost

Table 12. Cost of environmental mitigation and enhancement measures considered in assessing the environmental effects of continuing to operate the Beaver Falls Project (Sources: staff and Beaver Falls LLC).

<b>Enhancement/Mitigation Measures</b>	<b>Entity</b>	<b>Capital Cost (2018\$)<sup>a</sup></b>	<b>Annual Cost (2018\$)<sup>b</sup></b>	<b>Levelized Annual Cost<sup>c</sup> (2018\$)</b>
Develop an erosion and sediment control plan.	Staff	\$2,000	\$0	\$184
Operate the project developments in strict run-of-river mode.	Beaver Falls LLC, FWS, New York DEC, Staff	\$0	\$0	\$0
Maintain a 30-cfs minimum flow within the Upper Development bypassed reach.	Beaver Falls LLC, FWS, New York DEC	\$0	\$16,073 <sup>d</sup> (loss in energy)	\$12,698
Maintain a 30-cfs minimum flow within the left channel of the Lower Development bypassed reach.	Beaver Falls LLC, FWS, New York DEC	\$0	\$13,705 <sup>e</sup> (loss in energy)	\$10,827
Develop a stream flow and water level monitoring plan, including the installation of staff gages at both developments to verify head pond water level, per the Settlement Agreement.	Beaver Falls LLC, FWS, New York DEC, Staff	\$10,000	\$2,500	\$2,894

<b>Enhancement/Mitigation Measures</b>	<b>Entity</b>	<b>Capital Cost (2018\$)<sup>a</sup></b>	<b>Annual Cost (2018\$)<sup>b</sup></b>	<b>Levelized Annual Cost<sup>c</sup> (2018\$)</b>
Install and maintain a monitoring pin and data logger within the Lower Development bypassed reach.	Beaver Falls LLC, FWS, New York DEC	\$25,000	\$5,000	\$6,248
Design and install a new trash rack with 1-inch clear spacing at the Upper Development.	Beaver Falls LLC, FWS, New York DEC, Staff	\$430,000	\$45,000	\$75,074
Design and install a seasonal trash rack overlay at the Lower Development.	Beaver Falls LLC, FWS, New York DEC, Staff	\$140,000 <sup>f</sup>	\$10,000	\$20,768
Develop a trash rack installation and monitoring plan (if licensee installs seasonal overlays or seasonal trash rack replacement at the developments).	Beaver Falls LLC, FWS, New York DEC, Staff	\$2,500	\$500	\$625
Provide downstream fish passage facilities at the Upper Development, with a 30-cfs minimum conveyance flow, within 5 years of license issuance.	Beaver Falls LLC, FWS, New York DEC, Staff	\$75,000	\$21,073 <sup>g</sup>	\$23,542
Provide downstream fish passage facilities at the Lower Development, with a 30-cfs minimum conveyance flow, within 3 years of license issuance.	Beaver Falls LLC, FWS, New York DEC, Staff	\$75,000	\$18,705 <sup>h</sup>	\$21,671

<b>Enhancement/Mitigation Measures</b>	<b>Entity</b>	<b>Capital Cost (2018\$)<sup>a</sup></b>	<b>Annual Cost (2018\$)<sup>b</sup></b>	<b>Levelized Annual Cost<sup>c</sup> (2018\$)</b>
Provide a representative for the Beaver River Advisory Council, and contribute annually to the Beaver River Fund.	Beaver Falls LLC, FWS, New York DEC	\$0	\$1,288 <sup>i</sup>	\$1,017
Implement the proposed Bat and Avian Protection Plan, including seasonal restrictions on tree clearing in proximity to bald eagle nests and northern long-eared bat roost trees or hibernacula.	Beaver Falls LLC, FWS, New York DEC, Staff	\$2,000	\$0	\$184
Implement the proposed Invasive Species Management Plan, which includes installation of signage and an invasive species disposal station at the Upper Development small boat launch to minimize the spread of aquatic invasive plants and animals, and BMPs to minimize the spread of terrestrial invasive plants during construction.	Beaver Falls LLC, FWS, New York DEC, Staff	\$1,500	\$500	\$533

<b>Enhancement/Mitigation Measures</b>	<b>Entity</b>	<b>Capital Cost (2018\$)<sup>a</sup></b>	<b>Annual Cost (2018\$)<sup>b</sup></b>	<b>Levelized Annual Cost<sup>c</sup> (2018\$)</b>
Upgrade the existing small boat launch and improve shoreline fishing access; create a parking area near the existing small boat launch upstream of the Upper Development dam, within 3 years of license issuance, per the Settlement Agreement and Final Recreation Plan	Beaver Falls LLC, FWS, New York DEC	\$8,000	\$2,000	\$2,315
Continue to support operation and maintenance of the swim beach recreation area upstream of the Upper Development dam, currently leased to the Beaver River Recreation Association including installation of signage at the swim beach recreation area, per the Final Recreation Plan	Beaver Falls LLC	\$5,500	\$1,500	\$1,691
Install “end of canoe trail” signage at the small boat launch upstream of the Upper Development dam, per the Final Recreation Plan	Beaver Falls LLC	\$800	\$500	\$469

<b>Enhancement/Mitigation Measures</b>	<b>Entity</b>	<b>Capital Cost (2018\$)<sup>a</sup></b>	<b>Annual Cost (2018\$)<sup>b</sup></b>	<b>Levelized Annual Cost<sup>c</sup> (2018\$)</b>
Implement the proposed Final Recreation Plan, filed February 23, 2018, including the measures described above, with the exception of the provision to lease the swim beach area to a particular entity	Staff	\$14,300	\$4,000	\$4,475
Develop and implement an HPMP	Beaver Falls LLC, FWS, New York DEC	\$2,000	\$0	\$184
Conduct a cultural resources shoreline evaluation in 2021	Beaver Falls LLC, New York SHPO	\$7,500	\$0	\$689
Consult with the New York SHPO if previously unidentified cultural resources are discovered to ensure proper treatment of the resources	Staff	\$0	\$0	\$0

<sup>a</sup> Capital costs typically include equipment, construction, permitting, and contingency costs.

<sup>b</sup> Annual costs typically include operation and maintenance costs and any other costs that occur on a yearly basis.

<sup>c</sup> All capital and annual costs are converted to equal annual costs over a 30-year period to give a uniform basis for comparing costs.

<sup>d</sup> Cost based on a loss of 543 MWh in generation as provided by the applicant in its January 8, 2018 response to staff's additional information requests.

<sup>e</sup> Cost based on a loss of 463 MWh in generation as provided by the applicant in its January 8, 2018 response to staff's additional information requests.

- f Includes a Gantry system for operating the trash rack overlay.
  - g Includes the estimated annual cost to operate the downstream fish passage facility (\$5,000), plus the estimated loss of 543 MWh in generation (\$16,073).
  - h Includes the estimated annual cost to operate the downstream fish passage facility (\$5,000), plus the estimated loss of 463 MWh in generation (\$13,705).
  - i Assuming \$1,100 per year for 15 years, \$2,200 per year afterwards.
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## 5.0 CONCLUSIONS AND RECOMMENDATIONS

### 5.1 COMPREHENSIVE DEVELOPMENT AND RECOMMENDED ALTERNATIVE

Sections 4(e) and 10(a)(1) of the FPA require the Commission to give equal consideration to the power development purposes and to the purposes of energy conservation; the protection, mitigation of damage to, and enhancement of fish and wildlife; the protection of recreational opportunities; and the preservation of other aspects of environmental quality. Any license issued shall be such as in the Commission's judgment will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. This section contains the basis for, and a summary of, our recommendations for licensing the Beaver Falls Projects. We weigh the costs and benefits of our recommended alternative against other proposed measures.

Based on our independent review and evaluation of the environmental and economic effects of the proposed action and its alternatives, we selected the staff alternative as the preferred alternative for the combined Beaver Falls Project. We recommend this alternative because: (1) issuing a new license for the project would allow Beaver Falls LLC to continue to operate the combined project and provide a beneficial and dependable source of electric energy; (2) generation from the Beaver Falls Project, with a total installed capacity of 2.5 MW of electric capacity, comes from a renewable resource that does not contribute to atmospheric pollution; (3) the public benefits of this alternative would exceed those of the no-action alternative; and (4) the recommended measures would protect and enhance fish resources and would improve public recreation opportunities at the project.

In the following section, we make recommendations as to which environmental measures proposed by Beaver Falls LLC, or recommended by agencies or other entities, should be included in any license issued for the project. In addition to Beaver Falls LLC's proposed environmental measures listed below, we recommend additional staff-recommended environmental measures to be included in any license issued for the project.

#### 5.1.1 Measures Proposed by Beaver Falls LLC

Based on our environmental analysis of Beaver Falls LLC's proposal, as discussed in section 3, *Environmental Analysis*, and the costs presented in section 4, *Developmental Analysis*, we conclude that the following environmental measures proposed by Beaver Falls LLC would protect and enhance environmental resources and would be worth the cost. Therefore, we recommend that the following proposed measures be included in any license issued for the combined Beaver Falls Project:

## **Aquatic Resources**

- Operate the project in strict run-of-river mode, as described in the Settlement Agreement.
- Develop a stream flow and water level monitoring plan in consultation with, and approved by New York DEC and FWS, as described in the Settlement Agreement.
- Design and install trash racks at the Upper Development to provide 1-inch clear spacing, and place a seasonal overlay system at the Lower Development with the equivalent of 1-inch clear spacing, as described in the Settlement Agreement and clarified in Beaver Falls LLC's January 9, 2018, additional information response.
- Provide downstream fish passage facilities with 30-cfs conveyance flows, at both the Upper and Lower developments, as described in the Settlement Agreement.

## **Terrestrial Resources and Threatened and Endangered Species**

- Implement the proposed Invasive Species Management Plan, filed with the Settlement Agreement, to prevent the introduction and spread of aquatic and terrestrial invasive plant and animal species within the project boundary.
- Implement the proposed Bat and Avian Protection Plan, filed with the Settlement Agreement, to minimize project effects on the northern long-eared bat and bald eagle.

## **Recreation Resources**

- Improve the small boat launch by removing trees and constructing a new parking area and road to connect the highway to the parking area, per the Final Recreation Plan.
- Provide facility and sign maintenance at the swim beach area, per the Final Recreation Plan.
- Install "end of canoe trail" signage at the canoe take-out, per the Final Recreation Plan.

### **5.1.2 Additional Staff-Recommended Measures**

Under the staff alternative, the project would be operated with Beaver Falls LLC's proposed measures, as identified above, and the following additions or modifications:

- Develop an erosion and sediment control plan;
- Revise the proposed Final Recreation Plan, filed February 23, 2018, by removing the provision to lease the swim beach area to a particular entity; and
- Consult with the New York SHPO if previously unidentified cultural resources are encountered during the term of the license to ensure the proper treatment of these

resources and discontinue all ground-disturbing activities until the proper treatment of the resources is established.

Below, we discuss the basis for our staff-recommended measures and the rationale for modifying Beaver Falls LLC's proposal.

#### *Erosion and Sediment Control*

Constructing the proposed recreation enhancements at the Upper Development, and the proposed trash racks and downstream fish passage facilities at both developments, would result in ground and riverbed disturbance, respectively, and could result in sediment reaching or suspending within the Beaver River. Developing and implementing an erosion and sediment control plan with procedures and best management practices (BMPs) to minimize erosion, contain sediment, stabilize soils after construction is complete, and minimize turbidity would minimize effects to soils and aquatic resources associated with construction-related activities. Minimizing sediment transport from construction areas to the Beaver River would help preserve water quality in the river and protect fish and other aquatic biota. We estimate that the levelized annual cost to develop an erosion and sediment control plan would be \$184, and conclude that the benefits of the measure would outweigh the costs.

#### *Strict Run-of-River Operation*

Beaver Falls LLC proposes to make a good faith effort to maintain the Upper and Lower developments at or above the dam crest (799.4 and 769 feet NAVD 88, respectively), or flashboards (Lower Development; 770.35 feet NAVD 88) when in place. Under the Settlement Agreement, any deviations exceeding 0.5 foot below the aforementioned impoundment elevations would be a reportable event to New York DEC and FERC within 10 days of occurrence. As evidenced by their execution of the Settlement Agreement, New York DEC and FWS support Beaver Falls LLC's proposal to operate the project in run-of-river mode.

Operating the project in run-of-river mode, and limiting impoundment fluctuations to less than 0.5 foot below the dam crest or flashboards (Lower Development), would minimize project effects on water quality, particularly water temperature and DO concentrations. Shoreline erosion and resultant turbidity as well as sediment mobilization would be negligible as any changes in water levels would occur slowly. Similarly, the stability of impoundment levels and project flows would reduce the potential for stranding of fish and other aquatic organisms and minimize disruptions to habitat necessary for feeding, cover, spawning, and rearing. Therefore, we recommend that the Beaver Falls Project be operated in a run-of-river mode as proposed by Beaver Falls LLC.

### *Fish Protection and Passage*

The powerhouse intake has the potential to affect the impoundment fishery by entraining fish or impinging fish against the trash rack, resulting in injury or mortality. To reduce entrainment and impingement, Beaver Falls LLC proposes to install a new intake trash rack system (Upper Development) and seasonal overlays (Lower Development) with 1-inch clear spacing and 2-foot-per-second or less intake velocities, and would construct downstream fish passage facilities adjacent to the intake trash racks at each development, with 30-cfs conveyance flows. Final design and engineering specifications of both measures would be completed within 2 years of license issuance in consultation with New York DEC and FWS, with full implementation within 5 years and 3 years, respectively. Further, no later than 1 year prior to implementation, Beaver Falls LLC would finalize a trash rack installation and monitoring plan in consultation with New York DEC and FWS to define the terms under which the proposed overlays would be used and establish criteria to evaluate the effectiveness of the overlays.

As evidenced by their execution of the Settlement Agreement, New York DEC and FWS support Beaver Falls LLC's trash rack replacement, monitoring plan, and downstream fish passage facilities. The proposed 1-inch-spaced trash racks would considerably decrease the potential of turbine-induced mortality of resident gamefish (greater than 8 inches) within the project impoundments. Fishes greater than 4 inches would also benefit from the proposed approach velocities of less than or equal to 2 feet per second, leaving only smaller fish susceptible to entrainment. Based on swimming speeds of fishes residing in the project impoundment and the existing approach velocities in front of the intakes, most fish would also be able to avoid impingement. The proposed downstream fish passage facilities would provide a safe and efficient alternative for downstream fish movement. We estimate that the collective levelized annual costs to implement these measures would be \$141,055 and conclude that the benefits of the measures would outweigh the costs.

### *Stream Flow and Water Level Monitoring*

Beaver Falls LLC proposes to develop a stream flow and water level monitoring plan, in conjunction with New York DEC and FWS, that would permit independent verification of impoundment water levels. The plan would be finalized and all equipment would be calibrated and made operational within 2 years of license issuance. The parties agree that reporting would follow a staggered approach, initially occurring at 6-month intervals over the first 2 years, followed by annual reports for 2 years, and then every 5 years. This would ease regulatory and review burdens over time, after it has been determined that run-of-river conditions could be adequately maintained.

While the proposed plan would provide a means to independently verify compliance with run-of-river requirements, it does not address the 30-cfs conveyance

flows for downstream fish passage at both developments. As such, we recommend Beaver Falls LLC include provisions to monitor downstream fish passage conveyance flows at both developments in the final stream flow and water level monitoring plan. We estimate that the levelized annual costs to develop the plan would be \$2,894 and conclude that the benefits would outweigh the costs.

#### *Invasive Species Management*

Several aquatic and terrestrial invasive plant and animal species occur within the Black River Basin, an area that includes the Beaver Falls Project. The Invasive Species Management Plan, filed with the Settlement Agreement, includes measures to prevent the introduction and spread of terrestrial and aquatic invasive plant and animal species, such as employing best management practices (BMPs) during construction or maintenance, cleaning and drying boats that come into contact with water and use of invasive-free materials and seed stock during replanting, and providing informational signage on aquatic invasive plant and animal species and an invasive species disposal station to be placed at the small boat launch above the Upper Development dam. We estimate that the levelized annual cost to implement the Invasive Species Management Plan would be \$533, and conclude that the benefits of the measure would outweigh the costs.

#### *Bat and Avian Protection*

Construction of the proposed enhancements at the existing small boat launch above the Upper Development dam and maintenance of the project have the potential to impact nesting habitat for the state-listed threatened bald eagle, as well as summer roosting habitat for the federally listed threatened northern long-eared bat. Suitable summer roosting habitat for the northern long-eared bat exists within the project boundary, and bald eagles have been observed as close as 0.4 mile from the project boundary during the breeding season. The Bat and Avian Protection Plan, filed with the Settlement Agreement, includes provisions to: (1) notify FWS and New York DEC if bald eagle nesting activity or a northern long-eared bat roost tree or hibernacula is discovered within or immediately adjacent to the project boundary; (2) modify the timing of tree clearing activity to minimize impacts on bald eagles; (3) consult with FWS and New York DEC prior to tree clearing within the project boundary to ensure that there is no additional information on northern long-eared bat presence within the project boundary; and (4) during tree clearing, maintain a minimum distance of 150 feet from any known occupied maternity roost tree during the June 1 to July 31 period, and 0.25-mile distance from any known occupied bat hibernacula. We estimate that the levelized annual cost to implement the Bat and Avian Protection Plan would be \$184, and conclude that the benefits of the measure would outweigh the costs.

### *Recreation Management*

Beaver Falls LLC proposes to implement the proposed Final Recreation Plan, filed on February 23, 2018. The measures identified in the Final Recreation Plan would improve existing access at the small boat launch and swim beach area. The Final Recreation Plan would ensure that the small boat launch is improved, that signage improvements are implemented, and that a parking area is created near the small boat launch. The signage enhancements at the two access areas would improve project and public safety information for those recreating at the project compared to what is there now. Requiring Beaver Falls LLC to maintain the swim beach area ensures that the public would be able to recreate and enjoy this site for the term of any license issued. Staff recommends the implementation of the Final Recreation Plan with the exception of the swim beach area lease agreement, as discussed below. We estimate that the levelized annual cost of implementing these recreation measures would be \$4,475 and that the benefits of these measures justify the costs.

Beaver Falls LLC proposes to maintain a lease agreement with the Recreation Association for the operation of the swim beach area at the Upper Development. This recreation site is owned by Beaver Falls LLC and, therefore, the licensee is ultimately responsible for the oversight and management of this (and all) project recreation site(s) for the term of any license issued. The Commission does not have jurisdiction to hold a third-party responsible for the operation or maintenance of any recreation site owned by a licensee. Therefore, we do not recommend Beaver Falls LLC's proposal for the requirement of a lease agreement between Beaver Falls LLC and the Recreation Association. However, this does not preclude Beaver Falls LLC from entering into an off-license agreement with the Recreation Association for the operation of the swim beach area.

### *Cultural Resources Protection*

Archaeological or historic sites could be discovered during land-disturbing activities associated with project operation over the term of a license. Therefore, we recommend that Beaver Falls LLC notify the Commission and the New York SHPO if previously unidentified archaeological or historic resources are discovered during the term of any license issued. In the event of any such discovery, Beaver Falls LLC should discontinue any ground-disturbing activities until the need for treatment of the archaeological or historic resource is established.

### 5.1.3 Measures Not Recommended by Staff

#### *Flow Releases to the Bypassed Reaches*

In accordance with the Settlement Agreement, Beaver Falls LLC proposes to use conveyance flows from the proposed downstream fish passage facilities to deliver a continuous minimum flow of 30 cfs to the bypassed reach of the Upper Development and to the left channel of the Lower Development bypassed reach. Implementation would occur within 5 years (Upper Development) and 3 years (Lower Development) of license issuance. Beaver Falls LLC would also conduct 1 year of water level monitoring within the right bypassed channel of the Lower Development to confirm that current leakage and periodic spillage provide acceptable and stable water levels. In consultation with New York DEC and FWS, the monitoring data would be evaluated for a 1-year period to ensure that water levels are maintained at or above the monitoring pin location(s). If additional flows are required, either at the time of evaluation or at any point in the future, Beaver Falls LLC would provide them within 5 days of determination through notches in the flashboard or other means.

We do not recommend the 30-cfs flow releases to the bypassed reaches of the Upper Development and the left channel of the Lower Development as there is insufficient information to support the assertion that the proposed flows would protect and enhance aquatic habitat for fish and benthic macroinvertebrates. Similarly, we do not recommend flow monitoring in the right channel of the bypassed reach of the Lower Development. Leakage flows are expected to remain unchanged, thus monitoring is unnecessary. Further, any supplemental flows recommended as a result of the proposed monitoring would only be based on a reference of current flow conditions derived from a single visual observation and not a more comprehensive assessment.

#### *Beaver River Advisory Council and Beaver River Fund*

In the Settlement Agreement filed by Beaver Falls LLC, two “non-project measures” are proposed: (1) providing a representative to the Beaver River Advisory Council, chaired by New York DEC, to maintain involvement in changing conditions that may affect river flows and management in the project area; and (2) contributing to the Beaver River Fund maintained by Erie Boulevard Hydropower, LP (\$1,100 per year for the first 15 years of any license issued, and \$2,200 per year for the remainder of any license issued), which is used to fund projects in the Beaver River Basin relating to ecosystem restoration, public education, facility maintenance and other purposes.

We do not recommend representation on the Beaver River Advisory Council or contributions to the Beaver River Fund, because these actions are not associated with the Beaver Falls Project, nor do they represent specific measures that define the types of improvements, enhancements, and maintenance needs to which the funds would be

allocated. Because it is the Commission's strong preference to require specific measures directed towards a specific project effect and/or purpose, where such non-specific measures have been proposed, the Commission might not require them in a license.<sup>46</sup> However, this would not prevent Beaver Falls LLC, New York DEC, and FWS from pursuing such funding for measures separate from any license that may be issued.

#### *Future Archaeological Surveys*

The New York SHPO has determined that no historic properties would be affected by project operation with the condition that the shoreline be inspected 5 years after the original survey to determine if any changes have occurred (i.e., erosion, discovery of historic properties). Because no archaeological resources were found during the cultural surveys, and Beaver Falls LLC is not proposing any changes to project operation or reservoir levels, relicensing the project would not affect cultural resources. For these reasons, there is no need for future archaeological surveys.

#### *Historic Properties Management Plan*

Staff have determined that operation of the project would have no effect on historic or cultural properties in the APE. In a letter filed with the Commission on July 9, 2018, the New York SHPO stated that the project would have no effect on historic properties with the condition that the shoreline be surveyed again in 5 years. Therefore, we do not recommend the development and implementation of an HPMP to protect historic properties. Beaver Falls LLC does not need to file an HPMP with the Commission; however, if any future discoveries of cultural resources are made, Beaver Falls LLC must consult with the New York SHPO.

## **5.2 UNAVOIDABLE ADVERSE EFFECTS**

Some fish entrainment and turbine-induced mortality would occur despite the proposed low intake velocity (2 feet per second or less) and trash racks with 1-inch clear bar spacing or the equivalent (e.g. an overlay-type system). However, we expect the long-term impact of entrainment to have minimal consequences to the sustainability of the fish communities as only small fish would pass through the trash racks and larger fish would remain in the project impoundments.

Construction activities associated with the proposed trash rack replacement at the Upper Development, small boat launch recreational enhancements, and the downstream fish passage facilities at both developments may cause limited erosion and sedimentation and an increase in traffic and noise. These activities may affect aquatic and terrestrial biota, recreational users, and nearby homeowners. However, these construction-related

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<sup>46</sup> See *Policy Statement on Hydropower Licensing Settlements*, Docket No. PL06-5-000, issued on September 21, 2006.

effects are expected to be short-term and minor, and any impact to fish, wildlife, or humans would be minimal. Also, construction-related erosion and sedimentation would be minimized with implementation of an erosion and sediment control plan.

### **5.3 SUMMARY OF SECTION 10(j) RECOMMENDATIONS**

Under the provisions of section 10(j) of the FPA, each hydroelectric license issued by the Commission shall include conditions based on recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, and enhancement of fish and wildlife resources affected by the project.

Section 10(j) of the FPA states that whenever the Commission believes that any fish and wildlife agency recommendation is inconsistent with the purposes and the requirements of the FPA or other applicable law, the Commission and the agency will attempt to resolve any such inconsistency, giving due weight to the recommendations, expertise, and statutory responsibilities of the agency.

In response to our February 8, 2018, notice soliciting comments, recommendations, terms and conditions, and prescriptions, Interior filed seven section 10(j) recommendations for the project on April 5, 2018. Table 13 lists the recommendations filed subject to section 10(j), and indicates whether the recommendations are included under the staff alternative, as well as the basis for our preliminary determinations concerning measures that we consider inconsistent with section 10(j). Environmental recommendations that we consider outside the scope of section 10(j) have been considered under section 10(a) of the FPA and are addressed in the specific resource sections of this document.

We have preliminarily determined that one of FWS' recommendations within the scope of section 10(j) may be inconsistent with the purposes and requirements of the FPA or other applicable law.

#### **Flow Releases to the Bypassed Reaches**

FWS recommends that Beaver Falls LLC provide year-round, 30-cfs minimum flows to both the Upper Development bypassed reach and the left channel of the Lower Development's bypassed reach, and maintain the existing flow to the right channel of the Lower Development's bypassed reach, to protect and enhance aquatic habitat for fish and benthic macroinvertebrates downstream of the developments. However, FWS does not provide a specific justification for the adequacy or benefits of the 30-cfs flow to aquatic habitat within the developments' bypassed reaches. This recommendation is also part of the Settlement Agreement among Beaver Falls LLC, FWS, and New York DEC. Similarly, the Settlement Agreement does not provide sufficient information to justify year-round, 30-cfs flows to the bypassed reaches. We conclude that the FWS'

recommendation may be inconsistent with the substantial evidence standard of section 313(b) of the FPA.

Table 13. Analysis of fish and wildlife agency recommendations for the Beaver Falls Project (Source: staff).

<b>Recommendation</b>	<b>Agency</b>	<b>Within the Scope of Section 10(j)</b>	<b>Levelized Annual Cost</b>	<b>Recommend Adopting?</b>
1. Run-of-river operation and impoundment fluctuations limited to 0.5 foot below the dam crest or flashboards, as described in Section 3.1 of the Settlement Agreement.	Interior	Yes	\$0	Yes
2. Design and install trash racks with either 1-inch clear spacing or the equivalent at the Beaver Falls Project, as described in Section 3.3 of the Settlement Agreement.	Interior	Yes	\$95,842 (Upper Development - \$75,074; Lower Development - \$20,768)	Yes
3. Provide downstream fish movement facilities, including 30-cfs conveyance flows, at the Beaver Falls Project, as described in Section 3.3 of the Settlement Agreement.	Interior	Yes	\$45,213 (Upper Development - \$23,542; Lower Development - \$21,671)	Yes
4. Provide a year-round, 30-cfs flow into the bypassed reaches of the Beaver Falls Project, as described in Section 3.2 of the Settlement Agreement.	Interior	Yes	\$24,525 (Upper Development - \$12,698; Lower Development - \$10,827)	No, there is no evidence to justify the need for a 30-cfs flow in the bypassed reaches.

5. Develop and maintain a stream flow and water level monitoring plan in consultation with, and approved by, FWS and New York DEC, as described in Section 3.5 of the Settlement Agreement.	Interior	No, not a specific measure to protect or enhance fish and wildlife resources	\$2,984	Yes
6. Implement the Invasive Species Management Plan, filed with the Settlement Agreement, for the purpose of minimizing the introduction and spread of aquatic and terrestrial invasive plant and animal species.	Interior	Yes	\$533	Yes
7. Implement the Bat and Avian Protection Plan, filed with the Settlement Agreement, for the purpose of minimizing the effects of tree clearing on bald eagle and northern long-eared bat habitat.	Interior	Yes	\$184	Yes

## 5.4 CONSISTENCY WITH COMPREHENSIVE PLANS

Section 10(a)(2)(A) of the FPA, 16 U.S.C. §803(a)(2)(A), requires the Commission to consider the extent to which a project is consistent with the federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. We reviewed 10 comprehensive plans that are applicable to the Beaver Falls Projects, located in New York.<sup>47</sup> No inconsistencies were found.

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<sup>47</sup> (1) National Park Service. The Nationwide Rivers Inventory. Department of the Interior, Washington, D.C. 1993. (2) U.S. Fish and Wildlife Service. Canadian Wildlife Service. 1986. North American waterfowl management plan. Department of the Interior. Environment Canada. May 1986. (3) U.S. Fish and Wildlife Service. n.d. Fisheries USA: the recreational fisheries policy of the U.S. Fish and Wildlife Service. Washington, D.C. (4) New York Department of Environmental Conservation. 1979. Hudson River Basin water and related land resources: Level B study report and environmental impact statement. Albany, New York. September 1979. (5) New York Department of Environmental Conservation. 1985. New York State Wild, Scenic, and Recreational River System Act. Albany, New York. March 1985. (6) New York Department of Environmental Conservation. 1986. Regulation for administration and management of the wild, scenic, and recreational rivers system in New York State excepting the Adirondack Park. Albany, New York. March 26, 1986. (7) New York State Office of Parks, Recreation, and Historic Preservation. New York Statewide Comprehensive Outdoor Recreation Plan (SCORP): 2003-2007. Albany, New York. January 2003. (8) State of New York Black River Regulating District. 1948. General plan for the regulation of the flow of the Black River and certain of its tributaries. Albany, New York. February 3, 1948. (9) State of New York Hudson River Regulating District. 1923. General plan for the regulation of the flow of the Hudson River and certain of its tributaries. Albany, New York. June 7, 1923. (10) U.S. Fish and Wildlife Service. New York Department of Environmental Conservation. 1994. Fisheries enhancement plan for the Black River, New York. Department of the Interior, Amherst, New York. March 1994.

## **6.0 FINDING OF NO SIGNIFICANT IMPACT**

If the combined Beaver Falls Project is relicensed with our recommended measures, the project would operate while providing enhancements to fish and wildlife resources and improvements to recreation facilities in the project area.

Based on our independent analysis, issuance of a subsequent, major license for the combined Beaver Falls Project, with additional staff-recommended measures, would not constitute a major federal action significantly affecting the quality of the human environment.

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## 8.0 LIST OF PREPARERS

### Commission Staff

Andy Bernick – Project Coordinator, Geologic and Soil Resources, Terrestrial Resources, and Threatened and Endangered Species (Wildlife Biologist; Ph.D., Ecology, Evolutionary Biology, and Behavior; and B.S., Wildlife Biology and Management).

Monir Chowdhury – Engineering, Need for Power, and Developmental Resources (Engineer; Ph.D. and M.S., Environmental Engineering; and B.S., Civil Engineering, P.E.)

Allyson Conner – Recreation, Land Use, Aesthetic and Cultural Resources (Outdoor Recreation Planner; M.S., Recreation Management; and B.S., Recreation).

Chris Millard – Aquatic Resources (Water Quantity and Quality, Aquatic Biota) (Fish Biologist; M.S., Fish and Wildlife Biology and Management; and B.S., Environmental and Forest Biology).