ENVIRONMENTAL ASSESSMENT
FOR
SMALL HYDROELECTRIC PROJECT EXEMPTION

Smith's Falls Hydroelectric Project

FERC Project No. 15366-000

Vermont

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

July 2025

COMMISSION STAFF PAGE LIMIT AND DEADLINE CERTIFICATIONS

I certify that Commission staff has considered the factors mandated by the National Environmental Policy Act (NEPA) and that this environmental document represents a good-faith effort to disclose the most important considerations required by NEPA within the statutory page limit (42 U.S.C. § 4336a(e)) and the statutory deadline (42 U.S.C. § 4336a(g)). This certification reflects staff's expert judgment that the analysis contained within this environmental document is an accurate representation of the potential environmental effects of the proposed action and the analysis is substantially complete. In staff's judgment, any considerations addressed briefly or left unaddressed would not meaningfully inform the assessment of environmental effects.

NICHOLAS JAYJACK

Digitally signed by NICHOLAS JAYJACK
Date: 2025.07.08 09:49:45 -04'00'

Nicholas Jayjack
Director
Division of Hydropower Licensing

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ACRONYMS AND ABBREVIATIONS

APE	area of potential effects
certification	water quality certification
C.F.R.	Code of Federal Regulations
cfs	cubic feet per second
Commission	Federal Energy Regulatory Commission
CZMA	Coastal Zone Management Act
Dbh	diameter at breast height
DO	dissolved oxygen
EA	Environmental Assessment
ESA	Endangered Species Act
°F	degrees Fahrenheit
fps	feet per second
FERC	Federal Energy Regulatory Commission
FPA	Federal Power Act
FWS	U.S. Fish and Wildlife Service
IPaC	Information for Planning and Consultation
kV	kilovolt
mg/L	milligrams per Liter
MW	megawatt
MWh	megawatt-hour
National Register	National Register of Historic Places
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1966
NLEB	Northern long-eared bat
REA	Ready for Environmental Analysis
U.S.C.	United States Code
USGS	United States Geological Survey
Vermont ANR	Vermont Agency of Natural Resources
Vermont DEC	Vermont Department of Environmental Conservation
Vermont DHP	Vermont Division of Historic Preservation
Vermont SHPO	Vermont State Historic Preservation Office

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1.0 INTRODUCTION

1.1 APPLICATION

On July 2, 2024, the Town of Stowe Electric Department (Town) filed an application with the Federal Energy Regulatory Commission (FERC or Commission) to exempt its proposed 150-kilowatt (kW) Smith's Falls Hydroelectric Project No. 15366 (Smith's Falls Project) from the licensing requirements of Part I of the Federal Power Act (FPA).[1] The project would be located on the Little River in Lamoille County, Vermont (Figure 1).

1.2 PURPOSE OF ACTION AND NEED FOR POWER

1.2.1 Purpose of Action

The purpose of the project is to provide a source of hydroelectric power. The Commission must decide whether to grant the Town an exemption from licensing for the project and what conditions should be included in any exemption issued. Issuing an exemption from licensing for the Smith's Falls Project would allow the Town to generate electricity at the project, making electric power from a renewable resource available to the regional electric grid. The Town estimates that the average annual energy production of the project would be 410 megawatt-hours (MWh).

[1] The Commission is authorized to exempt from the licensing requirements of Part I of the FPA, small hydroelectric projects with an installed capacity of 10 megawatts or less that use for the generation of electricity either an existing dam (i.e., one in existence on or before July 22, 2005) or a "natural water feature" without the need for any dam or impoundment. *See* sections 405 and 408 of the Public Utility Regulatory Policies Act of 1978, 16 U.S.C. §§ 2705 and 2708, *amended by* the Hydropower Regulatory Efficiency Act of 2013, Pub. L. No. 113-23, 127 Stat. 493 (2013) (amending, *inter alia*, section 405 to define "small hydroelectric power projects" as having an installed capacity that does not exceed 10 megawatts). *See* section 2.0, *Proposed Action and Alternatives*, for information on compliance with 18 CFR §§ 4.30(b)(6) and 4.30(b)(31) (2024).

Figure 1. Location of the proposed Smith's Falls Project and FERC-licensed hydroelectric projects in the Little River Basin (Source: Staff).

We prepared this environmental assessment (EA) in compliance with the requirements of the National Environmental Policy Act of 1969 (NEPA)[2] and the Commission's implementing regulations.[3] This EA assesses the environmental effects associated with constructing and operating the project as proposed by the Town, and alternatives to the proposed project. It includes recommendations to the Commission on whether to issue an exemption from licensing, and if so, recommends terms and conditions to become a part of any exemption from licensing issued.

In this EA, we assess the environmental effects of: (1) no action (No-Action Alternative); (2) constructing and operating the project as proposed by the Town (Proposed Action); and (3) constructing and operating the project as proposed by the Town, with Commission staff's recommended additional and modified measures (Staff Alternative).

1.2.2 Need for Power

Under section 213 of the Public Utility Regulatory Policies Act (PURPA), the authority of the Commission to grant an exemption from licensing is not limited by a determination of the need for power.[4]

1.3 STATUTORY REQUIREMENTS

Any exemption from licensing for the project would be subject to numerous requirements under the FPA and other applicable statutes. The major statutory requirements that must be met prior to the issuance of any exemption from licensing are described in Appendix D, *Statutory Requirements*.

On March 20, 2025, the U.S. Army Corps of Engineers (Corps) issued a Clean Water Act (CWA) section 404[5] permit (permit) for the project, for the discharge of fill material into the

[2] National Environmental Policy Act of 1969, amended (Pub. L. 91-190. 42 U.S.C. §§ 4321–4347, as amended by Pub. L. 94-52, July 3, 1975, Pub. L. 94-83, August 9, 1975, Pub. L. 97-258, §4(b), September 13, 1982, Pub. L. 118-5, June 3, 2023). For tracking purposes under NEPA, the unique identification number for documents relating to this environmental review is EAXX-019-20-000-1744215115.

[3] 18 Code of Federal Regulations (C.F.R.) pt. 380 (2024).

[4] *See Briggs Hydroelectric*, 32 FERC ¶ 61,399 (1985); *see also David Cereghino*, 35 FERC ¶ 61,067 (1986).

[5] 33 U.S.C. § 1344(a).

Little River for the project's construction. The permit contains 38 general conditions associated with Vermont General Permits (GPs)[6] and 3 project-specific special conditions.[7]

1.4 PUBLIC REVIEW AND COMMENT

The Commission's regulations (18 C.F.R. § 4.38) require applicants to consult with appropriate resource agencies, Tribes, and other entities before filing an application for an exemption from licensing. This consultation is the first step in complying with the Fish and Wildlife Coordination Act (16 U.S.C. § 661 et seq.), Endangered Species Act (ESA) (16 U.S.C. § 1536), National Historic Preservation Act (NHPA) (54 U.S.C. § 306108), and other federal statutes. Pre-filing consultation must be completed and documented according to the Commission's regulations.

The Town invited Tribes, federal, state, and local agencies, and the general public to participate in meetings about the project, including a meeting on August 25, 2022, that was attended by the Vermont Agency of Natural Resources (Vermont ANR), Corps, U.S. Fish and Wildlife Service (FWS), Vermont Division of Historic Preservation (Vermont DHP), the Vermont Public Service Department, members of the public, and consultants.[8] On March 6, 2023, the Town conducted a site visit at the proposed project location. The Town submitted a draft exemption application to Tribes, state, federal, and local agencies, and non-governmental organizations.

The Town filed its application for an exemption from licensing on July 2, 2024.[9] On July 16, 2024, the Commission issued a public notice of application tendered for filing and soliciting additional study requests. The notice was published in the *Federal Register* on July 23, 2024.[10]

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[6] *See* General Permits for Vermont at: https://www.nae.usace.army.mil/Portals/74/docs/regulatory/StateGeneralPermits/Vermont/2022-2027-VTGP-NAE-2022-00024.pdf?ver=KAncWUwi-ymNxJE7F7OdgA%3d%3d.

[7] The Vermont GPs have an associated CWA section 401 water quality certification (WQC). *See* General Permit Water Quality Certification at: https://dec.vermont.gov/sites/dec/files/wsm/public-notices/401/Final-401-WQC-USACE-GP.pdf. The Corps is responsible for administering and enforcing those WQC conditions as part of its section 404 permit administration.

[8] The Town held additional public meetings on December 15, 2022, and March 6, 2023, and held meetings with federal agencies on February 1, 6 and June 25, 2024. For additional information on public outreach and consultation, see the Town's November 25, 2024, filing at Documentation of Consultation.

[9] The Town's application attached comments it received on the draft application, including joint comments from Vermont Natural Resources Council, the Vermont Council of Trout Unlimited, Friends of the Winooski River, and Vermont River Conservancy (collectively, NGOs). *See* the Town's July 2, 2024, Exemption Application at *Documentation of Consultation*.

[10] 89 Fed. Reg. 59,732.

On July 19, 2024, the NGOs filed joint comments regarding the environmental analysis.[11] Vermont DHP, which functions as the Vermont State Historic Preservation Office (Vermont SHPO), filed comments on November 3, 2024, noting that it did not anticipate additional study requests, but that additional consultation would be needed pursuant to section 106 of the NHPA. No formal study requests were filed. On November 18, 2024, John and Donna Adams filed comments pertaining to erosion and property rights on land adjacent to the impoundment. The Commission also received several comments from the community in support of granting the exemption.[12]

On March 13, 2025, the Commission issued a public notice accepting the exemption application, stating the Commission's intent to waive scoping, stating the application is ready for environmental analysis, and setting May 12, 2025, as the deadline for filing motions to intervene, protests, comments, recommendations, terms, and conditions. The notice was published in the *Federal Register* on March 19, 2025.[13] On April 2, 2025, John and Donna Adams filed comments pertaining to property rights for land adjacent to the impoundment. The Town filed reply comments on May 13, 2025. Vermont DHP filed recommendations on June 26, 2025. No comments were filed on the notice of intent to waive scoping. No motions to intervene, protests, recommendations, terms, or conditions were filed.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 NO-ACTION ALTERNATIVE

Under the No-Action Alternative (i.e., denial of the exemption), the project would not be constructed, and the site would remain in its current condition. The project would not generate an estimated average of 410 MWh, and environmental resources in the project area would not be affected. We use this alternative to establish baseline environmental conditions for comparison with other alternatives.

The existing project site includes an approximately 228.9-foot-long concrete dam (Smith's Falls Dam) that includes the following sections: (1) an approximately 7-foot-long south abutment; (2) a 160-foot-long spillway that includes a non-operational, south low-level outlet gate and has a crest elevation of 634.5 to 635.9 feet,[14] except for a 23.5-foot-long breached section with a minimum crest elevation of 633.5 feet; (3) an approximately 10-foot-long non-

[11] The NGOs' comments were a copy of their April 20, 2023, comments on the draft exemption application regarding dam removal, water quantity and quality, fish and wildlife, recreation, and energy generation. *See* n.9, *supra*. These topics are addressed in this EA, except for dam removal, which is not addressed because the Town is not proposing to remove the dam.

[12] *See* Stowe Electric Dept. Board of Commissioners November 29, 2024, Comments; Town of Stowe December 3, 2024, Comments; Town of Stowe Energy Committee December 5, 2024, Comments; and December 17, 2024, Community Letter signed by 20 community members.

[13] 90 Fed. Reg. 12,723.

[14] All elevations refer to North American Vertical Datum of 1988.

overflow section with a 3-foot-long north low-level outlet gate; (4) a 27-foot-long, 87-foot-wide mill building that includes an intake structure with two non-operational slide gates;[15] and (5) a 24.9-foot-long non-overflow section that includes a non-operational intake gate.[16]

The existing concrete dam was originally constructed for hydropower production in 1918 and had a spillway crest elevation of 635.9 feet. High flow events damaged the mill building and breached the dam on multiple occasions, eventually causing hydropower production to cease completely in 2011, when the spillway was breached to the existing minimum crest elevation of 633.5 feet. The existing dam creates an impoundment with a surface area of 1.02 acres at a normal surface elevation of 634.4 feet. The dam currently operates in a run-of-river mode with flow primarily discharged over the spillway, except for leakage through the low-level outlet gates.

2.2 PROPOSED ACTION

2.2.1 Project Facilities

The Smith's Falls Project would consist of a reconstructed 231.9-foot-long Smith's Falls Dam that includes: (1) a 10-foot-long south abutment that would replace the existing south abutment; (2) a modified 160-foot-long spillway that would include: (a) a 15-foot-long section with a new 2-foot-high concrete cap with a crest elevation of 635.8 feet; and (b) a 145-foot-long section with a new 2-foot-high concrete cap and a new 3-foot-high inflatable rubber crest gate with a maximum crest elevation of 635.8 feet;[17] (3) a new 10-foot-long non-overflow section with a 3-foot-long low-level outlet gate that would replace the north low-level outlet gate; (4) the 27-foot-long, 87-foot-wide mill building; and (5) a new 24.9-foot-long intake structure with a 7-foot-long slide gate and a 22.4-foot-long trashrack with 1-inch clear bar spacing.[18] The Town states that the reconstructed dam would create an impoundment with a surface area of 1.75 acres at a proposed normal maximum surface elevation of 636.0 feet.

From the impoundment, water would flow through the new intake structure to an approximately 105-foot-long concrete sluiceway that includes a 56-foot-long section of the existing sluiceway and two new sections totaling approximately 55 feet in length.[19] The sluiceway would convey water to a new 150-kW vertical Kaplan turbine-generator unit in a new 22-foot-long, 15-foot-wide wood and steel powerhouse. Water would be discharged from the

[15] The intake structure was historically used to convey flows from the impoundment to a 93-kW turbine-generator unit to produce electricity in the mill building. The generator and control system have been removed and the extant turbine is non-operational.

[16] The intake structure was used to convey flows from the impoundment to a 90-foot-long extant sluiceway and tailrace.

[17] The Town proposes to plug the south low-level outlet gate.

[18] The new intake structure would replace the existing intake structure.

[19] A 17-foot-long section would be upstream of the existing sluiceway and a 38-foot-long section would be downstream of the existing sluiceway.

powerhouse to a modified 40-foot-long, 12-foot-wide tailrace,[20] where it would return to the Little River. The project would create an approximately 170-foot-long bypassed reach of the Little River.

The Town proposes to use the mill building for housing the controls and switchgear. The Town proposes to repair the west wall of the mill building and remove a small addition that was built on the north side of the building.

Electricity generated at the project would be transmitted to the electric grid via a new 125-foot-long 0.48-kilovolt (kV) underground generator lead line and a new 0.48/12.47-kV step-up transformer that would be located approximately 200 feet northwest of the dam. The proposed project facilities are shown in Figure 2.

The Town filed a Conceptual Recreation Plan on November 25, 2024, that includes the following recreation facilities: (1) a 1,000-square-foot hand-carry boat access site on the north shoreline of the impoundment approximately 185 feet upstream of the dam; (2) a 485-foot-long fishing and boating access trail around the north side of the dam; and (3) a 1,500-square-foot hand-carry boat and fishing access site on the north riverbank approximately 70 feet downstream of the tailrace. The Town proposes to install five directional signs for the access trail.

2.2.2 Project Boundary

The Town proposes a project boundary that encloses approximately 3.3 acres, including: (1) 1.75 acres of the impoundment;[21] (2) 1.05 acre of land associated with the project facilities described above in section 2.2.1*, Project Facilities*; (3) 0.44 acre of land adjacent to the southern shoreline of the impoundment; and (4) 0.06 acre of land associated with an apartment building adjacent to the north shoreline of the impoundment. The proposed project facilities are shown in Figure 2.

[20] The upstream portion of the existing tailrace (comprising approximately half its length) would be replaced with the new 38-foot-long section of the sluiceway and new powerhouse.

[21] As shown in Figure 2, the impoundment enclosed by the project boundary does not follow the existing shoreline. Additional information on the project boundary is provided in section 3.3.5.2, *Environmental Effects, Land Use and Aesthetic Resources*.

Figure 2. Smith's Falls Project Facilities (Source: Staff).

2.2.3 Project Operation and Environmental Measures

The Town proposes the following operational and environmental measures.

- To protect aquatic resources, operate the project in a run-of-river mode by maintaining a normal maximum impoundment surface elevation of 636.0 feet.

- To protect aquatic and aesthetic resources, release a minimum flow of 15 cubic feet per second (cfs) or inflow, whichever is less, from the spillway to the bypassed reach.

- To protect fish from turbine entrainment, install a trashrack with 1-inch clear bar spacing.

- To reduce project-induced sedimentation during construction, implement the Flow Management Plan filed in section 2.9 of the application on February 18, 2025, including procedures for installing and removing cofferdams, managing flows and sediment, and disposing of excavated sediments at an offsite location.

- To prevent erosion and reduce the effects of project construction on upland and riparian habitats, implement the following measures: (1) place geotextile fabric and timber matting over soils during construction; (2) install rip rap along the shoreline, where applicable, following construction; and (3) revegetate disturbed areas with native vegetation following construction.

- To protect aquatic resources during impoundment drawdowns and refills for construction and planned maintenance, implement the Flow Management Plan filed in section 2.9 of the application on February 18, 2025, that includes provisions to: (1) following construction, increase the impoundment surface elevation by no more than 1 foot per day and maintain a minimum downstream flow of 15 cfs or, if inflow is less than 15 cfs, retain no more than 10% of inflow; and (2) for planned maintenance: (a) during impoundment drawdowns, lower the impoundment surface elevation by no more than 1 foot per day or 0.5 inch per hour; and (b) during impoundment refills, increase the impoundment surface elevation by no more than 1 foot per day or 0.5 inch per hour, and maintain a minimum flow of 15 cfs to the bypassed reach.

- To reduce the spread of invasives during project construction, implement the Invasive Species Plan filed as Appendix L of the application on February 18, 2025, including the following measures: (1) identify and use staging areas that are free of invasive species; (2) move from areas with no invasive species to areas with invasive species, when possible; (3) clean all equipment prior to moving from areas with invasive species to areas without invasive species; (4) limit removal of excavated material from sites with invasive species; (5) destroy or dispose of invasive species from any excavated material; and (6) cover soils containing invasive species during transport.

- To control invasive species associated with recreation use at the project, implement the Conceptual Recreation Plan filed as Appendix I of the application on November

25, 2024, including manual, mechanical, and herbicide control methods throughout the operation of the project.

- To protect the federally listed endangered northern long-eared bat (NLEB), avoid the removal of trees that are equal to or greater than 3 inches in diameter at breast height (dbh) between April 1 and November 1.

- To provide recreation opportunities, maintain the project recreation facilities proposed in the Conceptual Recreation Plan.

- To reduce the effects of construction on aesthetic resources: (1) limit all non-emergency outdoor lighting between the hours of 6:00 p.m. and 7:00 a.m. to only motion-activated lighting; (2) restrict all construction to the hours of 7:00 a.m. to 7:00 p.m. Monday through Friday, and 8:00 a.m. to 5:00 p.m. on Saturdays; and (3) prohibit construction on Sundays and state and federal holidays.

- To protect historic properties that are eligible for listing or listed on the National Register of Historic Places (National Register), develop a historic properties management plan (HPMP).

2.3 STAFF ALTERNATIVE

2.3.1 Project Facilities and Boundary

Under the staff alternative, the project and project boundary would include the entire water surface area of the impoundment at the proposed normal maximum surface elevation of 636.0 feet, instead of the 1.75-acre impoundment proposed by the Town.[22] The project boundary would exclude 0.06 acre of land associated with an apartment building that the Town proposes to include in the project boundary.

2.3.2 Project Operation and Environmental Measures

Under the Staff Alternative, the project would be operated as proposed by the Town, with the following staff-recommended modifications and additional measures.

- To minimize project-induced erosion and sedimentation, develop a soil erosion and sediment control plan that includes: (1) a detailed description of the site conditions (i.e., soil type, vegetative cover, and topography) where construction/soil disturbance would occur; (2) site-specific measures and BMPs to control erosion, prevent slope instability, and minimize the quantity of sediment resulting from project construction and operation (i.e., geotextile fabric, timber matting, riprap, and silt fences), as

[22] Satellite imagery shows that the proposed 1.75-acre impoundment does not follow the existing shoreline and that the project boundary does not include the entire surface area of the impoundment at the proposed normal maximum surface elevation of 636.0 feet. Updated shapefiles and topographic data are needed to quantify the surface area of the impoundment at the proposed normal maximum surface elevation of 636.0 feet.

generally proposed by the Town; (3) sedimentation provisions consistent with the Town's proposed Flow Management Plan; (4) a map showing the locations of all proposed erosion and sediment control measures; (5) a description of temporary soil storage measures and identification of all off-site soil disposal location(s); (6) procedures and schedule for monitoring the effectiveness of site-specific mitigation measures; (7) provisions for shoreline erosion monitoring and mitigation, including: (a) a description of methods for documenting impoundment shoreline erosion prior to construction and within 2 years after the project commences operation, to determine the extent and magnitude of any project-induced erosion (i.e., erosion occurring in new areas resulting from increasing the impoundment surface elevation from 634.4 feet to 636.0 feet); (b) consultation with FWS and Vermont ANR on repairs at any sites of project-induced erosion and measures to prevent further project-induced erosion (e.g., placing riprap or installing a gabion wall on project land at the erosion site); and (c) a report to be filed with the Commission by March 1 of the year following the second erosion survey, including: (i) the results of the two erosion surveys, including descriptions of the erosion (elevation, length, severity) and maps depicting the extent of erosion along the shoreline; (ii) conclusions regarding the cause of any new erosion following project construction, including whether increasing the impoundment elevation resulted in any new erosion; (iii) any proposed measures for repairing project-induced erosion and preventing further project-induced erosion; and (iv) documentation of consultation with the agencies; and (8) an implementation schedule.

- To protect aquatic and terrestrial resources during impoundment drawdowns and refills related to maintenance and emergencies, implement the following drawdown and refill procedures: (1) for planned drawdowns, lower impoundment levels at a rate not exceeding 1 foot per day or 0.5 inch per hour, as proposed by the Town; and (2) after planned and unplanned drawdowns, implement the following impoundment refill procedure: (a) if inflow is 15 cfs or greater, increase impoundment levels by no more than 1 foot per day or 0.5 inch per hour, and release a minimum flow of 15 cfs to the bypassed reach, as proposed by the Town; or (b) if inflow is less than 15 cfs, release 90% of inflow downstream to the bypassed reach and use 10% of inflow to refill the impoundment.

- To reduce the effects of project construction on freshwater mussels, develop a pre-construction mussel survey and relocation plan in consultation with FWS and Vermont ANR, including the following provisions: (1) survey the impoundment for freshwater mussels prior to the impoundment drawdown for construction; and (2) if mussels would be stranded during the impoundment drawdown, then develop procedures for relocating mussels to areas that would remain wetted during the drawdown.

- Develop an operation compliance monitoring plan that includes: (1) a detailed description of how the Town will maintain, monitor, and document compliance with the operational requirements of any exemption from licensing; (2) a description of the gages, sensors, and other measuring devices used to monitor compliance with the

requirements of any exemption from licensing; (3) a schedule for installing any monitoring equipment needed to document compliance with the operational requirements of any exemption from licensing; (4) procedures for maintaining and calibrating monitoring equipment; (5) standard operating procedures to be implemented outside of normal operating conditions, including procedures for deflating the rubber crest gate to manage flows during high flow events to minimize flooding upstream of the dam to the extent possible, and procedures for scheduled and unscheduled facility shutdowns; and (6) notifying the Commission of planned and unplanned deviations from the requirements of any exemption from licensing.

- To protect wildlife habitat following project construction, develop a construction vegetation management plan that includes the following provisions: (1) revegetating project construction areas and restoring the pre-construction elevations and contours of land within 30 days of completing work in the areas; (2) a description of the project construction areas to be revegetated following construction, including acreages, topography, soil types, and existing vegetation; (3) a description of the measures to be taken to revegetate disturbed areas with native vegetation and seed, as proposed by the Town; (4) a description of the techniques and BMPs to be used to control the establishment, reintroduction, and spread of non-native invasive plants until disturbed areas are successfully revegetated, as proposed by the Town in the Invasive Species Plan; (5) a 2-year post-construction monitoring period that includes criteria for measuring the success of revegetation efforts and invasive species control efforts, and a description of procedures to be followed if monitoring shows that revegetation or invasive species control measures are not successful; (6) a schedule for filing reports on the progress of revegetation with the Commission; and (7) an implementation schedule that provides a timeline for initiating and completing construction-related vegetation management activities within disturbed areas.

- To enhance recreation opportunities at the project, develop a recreation management plan that includes the following provisions: (1) a description of the proposed recreation facilities and signage, including the materials, locations, and dimensions of the recreation facilities and associated amenities; (2) installation of a "Portage Ahead" sign on land owned by the Town in the project boundary (e.g., on the south shoreline of the impoundment, immediately downstream of the Moscow Road Bridge); (3) installation of a portable toilet adjacent to the parking lot; (4) marking the trail within the parking lot; (5) designating three parking spots with signage for vehicles for recreation access; (6) a map showing the location of the recreation facilities proposed in the Conceptual Recreation Plan, and portable toilet and parking spots; (7) a construction, operation, and maintenance schedule for the recreation facilities; (8) a description of maintenance activities and vegetation management at the recreation facilities; and (9) filing a report with the Commission every 10 years to assess the condition and adequacy of the recreation facilities.

3.0 ENVIRONMENTAL ANALYSIS

This section includes: (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

recommended environmental measures.[23] Sections are organized by resource area (aquatics, terrestrial, recreation, etc.), with historic and current conditions described first. Current conditions are the baseline against which the environmental effects of the Proposed Action and alternatives are compared. Staff conclusions and recommendations are discussed in section 5.0, *Recommended Alternative*.[24]

3.1 GENERAL DESCRIPTION OF THE RIVER BASIN

The project would be located on the Little River at the site of the existing Smith's Falls Dam (Figure 2). The Little River originates at the confluence of Sterling Brook and Moss Glen Brook near the border between the Towns of Stowe and Morristown, Vermont, and flows in a southerly direction for approximately 15 miles where it joins the Winooski River about 2.5 miles northwest of the Village of Waterbury, Vermont (Figure 1). The Little River Basin has a total drainage area of approximately 112 square miles. Three dams are located on the Little River including, from downstream to upstream, the Waterbury Dam (river mile (RM) 2.7), Smith's Falls Dam (RM 6.8), and the Pike Dam (RM 9) (Vermont ANR, 2025). Hydroelectric power is generated at the Waterbury Hydroelectric Project No. 2090 located at the Waterbury Dam. The drainage area of the Little River at the proposed project is approximately 66 square miles.

The proposed project is located within the Northern Green Mountains physiographic region of Vermont. This region includes Vermont's highest mountain (Mount Mansfield at 4,393 feet), its coldest climate, and the greatest annual precipitation (Vermont FWD, 2014). Northern hardwood forest is the dominant forest community in the region. Climate in the project area is characterized by cold, snowy winters and warm summers. Monthly mean temperatures ranged from 17.5 degrees Fahrenheit (°F) in January to 67.3 °F in July between 1990 and 2024 (National Weather Service, 2025). During the same period, average annual precipitation ranged from 32.4 to 61 inches and average annual snowfall ranged between 97.3 and 178.7 inches per year (National Weather Service, 2025).

3.2 CUMULATIVE EFFECTS

A cumulative effect is the effect on the environment that results from the incremental effect of the action when added to the effects of other past, present, and reasonably foreseeable actions, regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over time, including hydropower and other land and water development activities.

Based on Commission staff's review of the application and public comments, staff did not identify any resources that could be cumulatively affected by construction and operation of

[23] Appendix A, *Glossary of Terms*, includes definitions of selected terms relating to the project, environment, and our analysis.

[24] Unless otherwise indicated, the source of our information is the application for exemption from licensing filed on July 2, 2024; and additional information filed by the Town on November 25, 2024, December 4, 2024, January 22, 2025, February 18, 2025, March 14, 2025, and March 21, 2025.

the Smith's Falls Project. Therefore, all effects discussed in this EA are direct and indirect effects of the proposed project.

3.3 PROPOSED ACTION AND ACTION ALTERNATIVES

In this section, we discuss the effects of the Proposed Action and 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, Commission staff determined that geology and soils, aquatic, terrestrial, threatened and endangered species, recreation, land use, aesthetic, and cultural resources may be affected by the Proposed Action and action alternatives.

3.3.1 Geology and Soils

3.3.1.1 Affected Environment

The bedrock in the region where the project would be located is primarily acidic, composed of non-calcareous schists, phyllites, gneisses, and granofels. The dominant surficial geology of the Little River watershed consists of glacial till followed by outwash (ice-contact deposits), alluvial, and lacustrine deposits. Alluvial deposits, outwash, and lacustrine are dominant within the Little River. The watershed is primarily comprised of highly erodible and potentially highly erodible soils. Much of the land immediately adjacent to the river corridor contains areas of non-highly erodible soils (Lamoille County Planning Commission, 2010).

Soils within and adjacent to the proposed project boundary are primarily Boothbay silt loam, Colton-Duxbury complex, and Ondawa fine sandy loam, with smaller amounts of Swanville silt loam and Rumney fine sandy loam (Figure B-1). Soils around the existing impoundment generally consist of well-drained sands and silt loams. Poorly drained sands and silt loams generally correspond with wetlands and sediment bars in and around the impoundment.[25]

The river reach encompassing the proposed project has experienced extensive straightening and encroachment primarily as a result of development and roads that run parallel to the river (Lamoille County Planning Commission, 2010). Straightening of the river channel has resulted in an increase in stream power so that much of the sediment that enters the river continues downstream without deposition. The river reach downstream of the existing Smith's Falls Dam is particularly sediment deprived, as sediments traveling downstream are retained upstream of the dam.

As mentioned above, the existing impoundment is partially filled with sediment that has been trapped and deposited upstream of the existing dam. To assess the quantity of sediment within the impoundment, the Town conducted sediment probing on May 5, 2021. Additionally,

[25] Staff accessed the USGS Web Soil Survey mapping tool and generated a map of the project area: https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.

sediment samples were collected at 4 locations between the project dam and upstream Moscow Road Bridge on November 11, 2021, and analyzed for contaminants.

The Town estimated that 5,000 cubic yards (3.1 acre-feet) of sediment are stored behind the existing dam. Sediment probing revealed a maximum of 10 feet of sediment measured immediately upstream of the dam with sediment depths ranging from 4 to 6 feet further upstream. Sediments primarily included coarse sand and gravel with some silt. Concentrations of contaminants (e.g., trace heavy metals, polychlorinated biphenyls, polycyclic aromatic hydrocarbons, pesticides, volatile organic compounds, total organic carbon, and total phosphorus) were low, including below Vermont's residential human exposure thresholds and Vermont's screening levels, and unlikely to adversely affect freshwater aquatic biota. The Town concluded that sediment/spoils removed from the impoundment during project construction would be suitable for general reuse or could be disposed of at any suitable and legal disposal site authorized to receive soil.[26]

3.3.1.2 Environmental Effects

Project Construction

The Town proposes to construct the project facilities described in section 2.2.1, *Project Facilities*. The Town proposes to draw down the impoundment from a water surface elevation of 634.4 feet to 627.0 feet to provide access to the dam for modification for approximately 6 months during construction. Following construction, the Town would refill the impoundment to a water surface elevation of 636.0 feet.

To reduce sediment mobilization during construction, the Town proposes to implement a Flow Management Plan that includes the following provisions during construction: (1) install a temporary northern cofferdam to isolate the northern end of the dam including the mill building, low-level outlet gate, and intake structure; (2) excavate accumulated sediment downstream of the temporary cofferdam, dewater the area, and dispose of sediment offsite at an upland location approved by the Corps; (3) allow turbidity to settle, then pump water out of the cofferdam area to expose the low-level outlet gate; (4) install a temporary southern cofferdam to isolate the work area at the southern end of the dam, where the proposed inflatable rubber crest gate would be constructed; (5) excavate accumulated sediment behind the southern temporary cofferdam, dewater the area, and dispose of sediment offsite at a pre-approved, legal, upland location; (6) remove the section of the northern cofferdam that is upstream of the low-level gate and open the gate to draw down the impoundment; (7) modify the southern portion of the dam, including permanently plugging the southern low-level outlet gate and installing the proposed inflatable rubber crest gate; (8) remove the southern cofferdam, re-establish the northern cofferdam, and direct flows to the south towards the inflatable rubber crest gate; (9) modify the northern portion

[26] *See* the Town's November 25, 2024, Response to Additional Information at Appendix H.

of the dam, including installing a new low-level outlet gate and intake structure, and restoring the mill building; and (10) remove the northern cofferdam and allow impoundment to refill.[27]

The Town proposes to prevent erosion and reduce the effects of project construction on upland and riparian habitats by placing geotextile fabric and timber matting over soils during construction and installing rip rap, where applicable, and revegetating disturbed areas with native vegetation following construction.

The Corps' section 404 permit special condition 2 requires the Town to dispose of all excess material removed during project construction at the existing Percy Pit located at 1012 Cochran Road in Morristown, Vermont.

In comments filed on November 18, 2024, John and Donna Adams state that their property is adjacent to the impoundment and has experienced significant issues with shoreline erosion in the past. The Adams state that increasing the impoundment elevation as proposed could exacerbate shoreline erosion.

Our Analysis

Ground Disturbance

Project construction has the potential to cause localized erosion, slope instability, and sedimentation if control measures are not put into place around work areas. Additionally, without control measures, surface runoff from disturbed areas and/or dredge material could introduce suspended particles into the river and degrade water quality.

The Town's proposed Flow Management Plan includes construction procedures to manage discharges and reduce sediment mobilization during construction. However, the Town states that the Flow Management Plan is a suggested sequence of events that could change prior to and during construction. Additionally, some of the proposed construction activities are not fully described (i.e., tailrace construction and shoreline protection) or remain in the conceptual phase (e.g., fishing and boating access trail), and are subject to change as designs are finalized.

The Town estimates that approximately 500 cubic yards of uncontaminated sediment would be removed from the impoundment during project construction. All sediment would be disposed of off-site at an upland location identified by the Town and approved by the Corps. As discussed above, the Corps' special condition 2 requires excess material to be disposed at Percy Pit. Based on the Town's proposal and the Corps' requirement, it is unclear whether all dredged material would be disposed at Percy Pit or only "excess" material. It is also unclear if/where the Town would temporarily store dredged materials prior to disposal and, if so, what measures, if any, would be implemented to prevent dredged material from re-entering the Little River.

Developing a soil erosion and sediment control plan that is based on final project design plans and that identifies site-specific measures for erosion and sedimentation, would minimize project effects on erosion and sedimentation. The plan could be developed in consultation with

[27] The Town's Flow Management Plan is generally consistent with the Corps' Vermont General Permit conditions 14 through 19.

FWS and Vermont ANR and include: (1) a detailed description of the site conditions (i.e., soil type, vegetative cover, and topography) where construction/soil disturbance would occur; (2) site-specific measures and BMPs to control erosion, prevent slope instability, and minimize the quantity of sediment resulting from project construction and operation (i.e., geotextile fabric, timber matting, riprap, and silt fences), as generally proposed by the Town; (3) sedimentation provisions consistent with the Town's proposed Flow Management Plan; (4) a map showing the locations of all proposed erosion and sediment control measures; (5) a description of temporary soil storage measures and identification of all off-site soil disposal location(s); (6) procedures and schedule for monitoring the effectiveness of site-specific mitigation measures; and (7) an implementation schedule

With effective erosion control measures in place, project construction and operation would not result in significant quantities of sediment entering the Little River. Implementation of the soil erosion and sediment control plan would minimize project-related erosion and sedimentation, and minimize effects on aquatic and terrestrial resources.

Impoundment Shoreline Erosion

As discussed above in section 3.3.1.1, straightening of the Little River channel has resulted in an increase in stream power so that much of the sediment that enters the river continues downstream without deposition. The existing impoundment is small (1.02 acres), narrow (generally less than 130-feet-wide), and, because of the dam, partially filled with sediment. As a result, it is riverine in nature with a short water residence time.

Upstream of the existing impoundment, the river channel includes two sharp bends with sediment deposition and shoreline erosion occurring at each location. One of the riverbends is approximately 1,000 feet upstream of the dam and immediately upstream of the proposed impoundment. At this location, the Little River flows directly into the embankment of Moscow Road and abruptly transitions from flowing southwest to northwest. The area immediately downstream of this transition has changed significantly, primarily during flood events, in recent years (Figure B-2). Most notably, an island has formed as a result of sediment deposition and the river channel has split and moved eastward by eroding the eastern bank of the river, including land that is owned by the Adams. This actively eroding area would be the shoreline of the impoundment at the proposed normal maximum surface elevation of 636.0 feet.

The other sharp riverbend is immediately upstream of the Moscow Road Bridge at the upstream extent of the current impoundment (approximately 450 feet upstream of the dam). At this location, flow is constricted by the bridge which has led to sediment deposition on the western shoreline and erosion on the northern and eastern shoreline of the impoundment, including land that is owned by the Adams. This actively eroding area would also be the shoreline of the impoundment at the proposed normal maximum surface elevation of 636.0 feet.

The existing spillway includes a 23.5-foot-long breached section with a minimum crest elevation of 633.5 feet that creates an impoundment with a surface elevation of 634.4 feet. The Town proposes to reconstruct the dam and restore the normal surface elevation of the impoundment to the historic elevation of 636.0 feet. Increasing the impoundment elevation from 634.4 to 636.0 feet, as proposed, would inundate land on the shoreline that is not currently

inundated. Altering the location of the water-soil interface on the northern and eastern shoreline of the impoundment has the potential to shift erosion to the new area that would be inundated following construction.

Surveying the impoundment shoreline for erosion following project construction would ensure that the Town can identify the location of any erosion occurring as a result of increasing the impoundment elevation to the historic elevation and identify what measures could be implemented to reduce or eliminate any newly eroded areas.[28] Developing a soil erosion and sediment control plan with the following provisions would ensure that any new erosion caused by restoring the impoundment surface elevation to historic levels is identified in a timely manner: (1) a description of methods for documenting impoundment shoreline erosion prior to construction and within 2 years after the project commences operation, to determine the extent and magnitude of any project-induced erosion (i.e., erosion occurring in new areas resulting from increasing the impoundment surface elevation from 634.4 feet to 636.0 feet); (2) consultation with FWS and Vermont ANR on repairs at any sites of project-induced erosion and measures to prevent further project-induced erosion (e.g., placing riprap or installing a gabion wall on project land at the erosion site); and (3) a report to be filed with the Commission by March 1 of the year following the second erosion survey, including: (a) the results of the two erosion surveys, descriptions of the erosion (elevation, length, severity), and maps depicting the extent of erosion along the shoreline; (b) conclusions regarding the cause of any new erosion following project construction, including whether increasing the impoundment elevation resulted in any new erosion; (c) any proposed measures for repairing project-induced erosion and preventing further project-induced erosion; and (d) documentation of consultation with the agencies.

Project Operation

Under current conditions most inflow passes over the partially breached spillway of the existing dam at an impoundment surface elevation of approximately 634.4 feet.[29] The Town proposes to redirect flows from the impoundment through the powerhouse to generate hydroelectric power by operating the proposed project in a run of river mode by maintaining a normal maximum impoundment surface elevation of 636.0 feet.

Our Analysis

Operating the project in a run-of-river mode with a normal maximum impoundment elevation of 636.0 feet would minimize the degree of water level fluctuations in the impoundment and, in turn, minimize project operational effects on shoreline erosion. As discussed below in section 3.3.2.1, *Aquatic Resources, Project Construction and Operation,* installing an inflatable rubber crest gate on the spillway, as proposed by the Town, would

[28] Project-induced shoreline erosion does not include shoreline erosion attributable to flood flows or natural phenomena, such as wind-driven wave action, erodible soils, and loss of vegetation due to natural causes.

[29] Some small amount of unregulated flow is conveyed through the low-level outlet gates and possibly the existing tailrace channel.

provide greater operational flexibility than the current dam that has a fixed crest elevation. During high flow conditions, the Town could lower the crest gate to a minimum crest elevation of 632.8 feet and release a greater volume of water than the current dam that has a spillway crest elevation of 634.5 to 635.9 feet, and a breached section with a minimum crest elevation of 633.5 feet. As a result, the Town's proposed construction and operation of the project would reduce impoundment fluctuations and minimize any shoreline erosion in the impoundment caused by project operation. As discussed in section 3.3.2.2*, Aquatic Resources, Operation Compliance Monitoring*, the Town could develop an operation compliance monitoring plan that includes procedures for deflating the rubber crest gate to manage flows during high flow events to minimize flooding upstream of the dam to the extent possible.

3.3.2 Aquatic Resources

3.3.2.1 Affected Environment

Water Quantity and Quality

The Little River is used for flood control, hydroelectric generation, recreation, and wildlife and aquatic habitat. There are no known water withdrawals in the proposed project boundary. The Town discharges stormwater and treated wastewater into the Little River approximately 2.1 miles upstream of the Smith's Falls Dam (The Town, 2025; Vermont ANR, 2025; Vermont DEC, 2025a). The average monthly flows at the dam range from a low of 67 cfs in September to a high of 403 cfs in April, with an average annual flow of 164 cfs.[30] Low flows (90% exceedance flows) ranged from 17 cfs in September to 174 cfs in April, and high flows (10% exceedance flows) ranged from 146 cfs in September to 792 cfs in April (Table C-1).

The Vermont Department of Environmental Conservation (Vermont DEC) designates the Little River in the project boundary as coldwater fish habitat with a designated use classification of B(2) (i.e., "good"). Based on these designations, relevant water quality standards for the proposed project include, in part: (1) the total increase from the ambient temperature due to all discharges and activities shall not exceed 1.0 °F; and (2) dissolved oxygen (DO) concentrations must be not less than 6 milligrams per Liter (mg/L) and 70% saturation at all times (Vermont DEC, 2022a). The river reach in the project boundary is on the Vermont DEC Stressed Waters List (Vermont DEC, 2020).[31] Stressors present within the proposed project area include sediments and stormwater pollutants resulting from channel instability/manipulation and urban/suburban development.

[30] Staff estimated flows at the project based on flow records from the United States Geological Survey (USGS) gage no. 04288295 on the Little River near Stowe, Vermont, which is approximately 0.5 river mile downstream of the proposed project. Staff prorated the USGS gage data by a factor of 0.99 to account for the difference in drainage area between the USGS gage (66.6 square miles) and the Smith's Falls Dam (66 square miles).

[31] Stressed waters are those where stressors are present that prohibit the waters from attaining higher water quality (Vermont DEC, 2020).

The Vermont DEC conducted DO and benthic macroinvertebrate sampling at locations downstream and upstream of the proposed project during the late summer/fall from 1996 to 2019 (Vermont ANR, 2025) (Table C-2; Figure B-3). The Vermont Fish and Wildlife Department (Vermont FWD) conducted a statewide water temperature study from June 1, 2019 through September 30, 2019, including monitoring sites 0.4 mile downstream and 3.6 miles upstream of the Smith's Falls Dam (Vermont FWD, 2020) (Figure B-3). Results of these studies are discussed in the analysis below.

Aquatic Habitat

The existing impoundment is shallow, with depths ranging from 1 to 10 feet. Substrate includes sand, with some silt immediately upstream of the dam, and coarse sand and gravel at the upstream end of the impoundment. The proposed bypassed reach would extend approximately 170 feet from the spillway to the outlet of the new tailrace. The bypassed reach includes a bedrock cascade immediately downstream of the dam (Figure B-4). Downstream of the cascade, water flowing to the north side of the river channel enters riffle and run habitat before flowing into a pool. Substrate in the north side of the river includes cobble and gravel. Water flowing into the south side of the river channel enters a deep pool with a mix of substrates ranging from boulders to sand. The pool is hydraulically controlled by a ledge outcrop approximately 350 feet downstream of the dam.

Aquatic Organisms

The Little River in the project area is designated as coldwater fish habitat by the Vermont ANR. The Little River approximately 1.2 miles downstream of the Smith's Falls Dam and the West Branch Little River approximately 3 miles upstream of the dam, are designated as Brook Trout Waters by the Vermont ANR and support several species of wild trout (Vermont ANR, 2025). According to the Vermont FWD, the mainstem Little River contains wild brook trout at higher elevations and wild brown trout and rainbow trout below the confluence with the West Branch Little River (Vermont FWD, 2017).

Vermont ANR conducted a fish survey in 1976 at sites near the downstream Miller Brook (approximately 1.7 miles downstream of the Smith's Falls Dam), and upstream in the West Branch Little River (Vermont ANR, 1977). An additional fish survey was conducted in 2008 by Vermont DEC near Miller Brook (Vermont DEC, 2010). Lastly, a limited presence/absence survey was conducted in 2022 by Vermont DEC. Collectively, results from the fish surveys indicate that the project area supports a variety of trout species including rainbow trout, brown trout, and brook trout, along with a low diversity of other resident cool water and cold water fish species (Table C-5).

There are 18 species of freshwater mussels native to Vermont, 10 of which are state listed as endangered and 1, dwarf wedgemussel, is federally listed as endangered (Vermont FWD, 2015). Thirteen species are considered Species of Greatest Conservation Need by the State of Vermont (Vermont FWD, 2015). Most mussel species in Vermont are found in the Lake Champlain drainage (Vermont FWS, 1995). No known mussel surveys have occurred in the

Little River.[32] However, the state listed endangered eastern pearlshell (*Margaritifera margaritifera*) is in the Winooski River, upstream and downstream of the confluence with the Little River.

3.3.2.2 Environmental Effects

Project Construction and Operation

Under current conditions, most inflow passes over the partially breached spillway of the existing dam at a normal impoundment surface elevation of 634.4 feet.[33] The Town proposes to release flow from the new intake structure to the powerhouse to generate hydroelectric power, which would divert flow from the spillway and create a 170-foot-long bypassed reach. The Town proposes to operate the proposed project in a run of river mode by maintaining a normal maximum impoundment surface elevation of 636.0 feet (corresponding to the maximum inflatable rubber crest gate elevation of 635.8 feet plus 2.4 inches of spill over the spillway). The minimum and maximum hydraulic capacities of the new powerhouse would be 75 and 150 cfs, respectively. The Town also proposes to release a minimum flow of 15 cfs or inflow, whichever is less, from the spillway to the bypassed reach at all times.

When inflow is less than the minimum hydraulic capacity of the powerhouse and the proposed minimum bypassed reach flow (i.e., 90 cfs), the Town would not generate but would release flow over the spillway of the dam. When inflow is greater than 90 cfs, the Town would operate the new powerhouse up to the 150-cfs maximum hydraulic capacity and would release the remaining flow over the spillway of the dam.

No entity provided comments or recommendations on the effects of project operation on aquatic resources in response to the Commission's REA notice.

Our Analysis

Construction

Increasing the height of a dam changes the impoundment water surface elevation, which could affect the availability and function of aquatic habitat within an impoundment. It could also result in an increase in upstream flooding if greater volumes of water are not able to be passed downstream.

The Town proposes to increase the impoundment surface elevation from 634.4 feet to 636.0 feet. Increasing the surface elevation of the impoundment would result in a small change in aquatic habitat. For example, the depth of the impoundment would increase by a maximum of 1.6 feet near the dam and lentic (i.e., still water) habitat would begin approximately 500 feet upstream from where it currently begins. Because the impoundment is shallow and the extent

[32] *See* the Town's July 2, 2024, Exemption Application at *Documentation of Consultation*.

[33] Some small amount of unregulated flow is conveyed through the low-level outlet gates and possibly the existing tailrace channel.

and magnitude of the surface elevation change is small, increasing the impoundment surface elevation is likely to have a negligible effect on aquatic habitat.

During high flow events (i.e., flooding), the Town states that it would deflate the rubber crest gate to an elevation of 632.8 feet to pass a greater volume of water downstream relative to existing conditions, where the spillway crest elevation is fixed and ranges from 634.5 to 635.9 feet, and the breached section has a minimum crest elevation of 633.5 feet. Because a greater volume of water could be passed downstream following the installation of the rubber crest gate, the proposed project would reduce the frequency and magnitude of upstream flooding.

The effects of impoundment drawdowns on aquatic habitat during construction are discussed below in *Impoundment Drawdowns and Refills*. Water would continue to be released to the proposed bypassed reach during construction. The water would flow through the north low-level outlet gate during construction. Flows would not be released over the spillway for approximately 6 months, which would dewater the cascade immediately downstream of the dam. Because the cascade does not provide suitable fish habitat, dewatering the cascades would not significantly affect aquatic habitat. Flows released through the low-level outlet gate during construction would maintain a wetted channel on the north side of the river and backwater pool habitat on the south side of the river. Therefore, project construction would not likely significantly affect aquatic habitat downstream of the dam.

Operation

The operation of hydropower projects in a run-of-river mode generally provides a more stable upstream and downstream environment than other modes of operation. For example, compared to peaking projects and storage projects, run-of-river operation minimizes the degree of water level fluctuations and associated erosion, changes to aquatic habitat, and temperature fluctuations in impoundment surface waters (due to shorter water residence times), and results in a downstream flow regime that is more similar in magnitude and timing to natural river flows.

Water quality sampling in the project area indicates that DO concentrations range from 8.6 to 12.5, which is adequate to sustain aquatic life (Table C-2). Results from the benthic macroinvertebrate sampling also indicate good water quality with assessment values ranging from good to excellent (Table C-2). Lastly, results from continuous water temperature monitoring indicate that water temperatures downstream and upstream of the dam are nearly identical (Table C-3).

Operating the project in a run-of-river mode would ensure that water quality in the impoundment and downstream of the project is unchanged from current conditions and remains suitable for aquatic resources. By operating the project in a run-of-river mode as proposed, habitat in the impoundment and in the Little River downstream of the project would remain unchanged from current conditions for aquatic organisms, including fish, mussels, and macroinvertebrates. Therefore, operating in run-of-river mode would minimize the effects of project operation on water quantity and water quality in the impoundment and downstream of the project to the greatest extent possible.

As discussed above, following project construction, the surface elevation of the impoundment would be raised by approximately 1.6 feet, from 634.4 to 636.0 feet, and the

surface area of the impoundment would increase from approximately 1.02 to 1.75 acres.[34] Increasing the surface area of the impoundment would increase the residence time of water within the impoundment from approximately 36 to 48 minutes.[35] Impoundments with short water residence times generally have a limited effect on DO and temperature because water flows though the impoundment before any substantial warming can occur. Because the impoundment is shallow and the water residence time is short, under both current and proposed conditions, increasing surface area of the impoundment is unlikely to affect water quality in the impoundment.

Minimum Flows

Under current conditions, most inflow passes over the partially breached spillway of the existing dam at a normal impoundment surface elevation of approximately 634.4 feet.[36] The Town proposes to release flow from the new intake structure to the powerhouse to generate hydroelectric power, which would divert flow from the spillway and create a 170-foot-long bypassed reach. The Town proposes to maintain the normal maximum surface elevation of the impoundment at 636.0 feet (corresponding to the maximum inflatable rubber crest gate elevation of 635.8 feet plus 2.4 inches of spill over the spillway). The Town proposes to provide a minimum flow of 15 cfs or inflow, whichever is less, from the spillway to the bypassed reach at all times. The Town states that maintaining the impoundment level at 635.91 feet would release 15 cfs over the spillway to the bypassed reach.

When inflow is less than the 75-cfs minimum hydraulic capacity of the powerhouse and the proposed 15-cfs minimum bypassed reach flow (i.e., 90 cfs), the Town would not generate but would release flow over the spillway of the dam. When inflow is greater than 90 cfs, the Town would operate the new powerhouse up to the 150-cfs maximum hydraulic capacity and would release the remaining flow over the spillway of the dam.

No entity provided comments or recommendations on minimum flows to the bypassed reach in response to the Commission's REA notice.

Our Analysis

The Town conducted an Instream Flow Study to evaluate aquatic habitat in the bypassed reach. Water depth, velocity, and streambed substrate were measured along 3 transects ranging

[34] *See* section 3.3.5.2, *Recreation, Land Use, and Aesthetic Resources, Project Boundary,* for a discussion on the size of the impoundment.

[35] Water residence time measures the average length of time the impoundment stores water. Commission staff calculated the water residence time at the project by using the existing and proposed storage capacity of the impoundment 378,971.4 cubic feet (8.7 acre-feet) and 453,023.3 cubic feet (10.4 acre-feet), respectively, divided by a 590,400 cubic feet per hour (164 cfs) mean annual flow.

[36] Some small amount of unregulated flow is conveyed through the low-level outlet gates and possibly the existing tailrace channel.

from 65 to 150 feet downstream of the dam. Measurements were collected at 34.4 and 48.6 cfs. Water depths and velocities were modeled under a third flow condition, 15 cfs, using the Corps' Hydrologic Engineering Center's River Analysis System. Collected/modeled data were used to determine suitable habitat for 10 aquatic species/life stages (i.e., 9 fish species/life stages and benthic macroinvertebrates) at each flow.

The Town's Instream Flow Study indicated that just under half of the proposed bypassed reach, from immediately adjacent to the dam to approximately 65 feet downstream, consists of a steep bedrock cascade that does not provide suitable fish habitat. Habitat suitability in the remaining half of the bypassed reach varied between species/life stages with flow changes resulting in generally minor changes to aquatic habitat. Across all transects and species/life stages examined, the length of suitable habitat was estimated at 377.8 feet, 479.4 feet, and 487.4 feet at flows of 15, 34.4, and 48.6 cfs, respectively (Table C-4). The majority of suitable habitat was present in pool habitat (i.e., 73%, 65%, and 66% of all suitable habitat at flows of 15 cfs, 34.4 cfs, and 48.6 cfs, respectively). Suitable habitat changed most significantly between 15 and 34.4 cfs, primarily driven by a large (76.3 feet or 1,126%) increase in run habitat located on the north side of the channel. The relatively small changes in suitable pool habitat between flows is attributed to the ledge outcrop downstream of the dam that backs up water and ensures the area remains wetted even at low flows. No unique habitat was identified within the bypassed reach that might limit aquatic species survival/reproduction downstream of the proposed project at any of the target flows.

Based on flow data collected from 2017 through 2024, inflow is less than 90 cfs approximately 45% of the time. When inflow is less than 90 cfs, the project would not generate, and flow would not be diverted from the spillway to the powerhouse. All inflow would be released to the bypassed reach and aquatic habitat would be unchanged from current conditions. Conversely, flow to the bypassed reach would be reduced relative to current conditions approximately 55% of the time when the project is generating (i.e., the inflow greater than 90 cfs) (Table C-1).

As discussed in section 3.3.2.1, *Aquatic Resources, Project Construction and Operation,* limited water quality monitoring upstream and downstream of the dam indicates that water quality conditions are adequate to sustain aquatic life, even during the summer months when there is low inflow. Spill over the dam and the steep gradient in the first half of the bypassed reach (i.e., bedrock cascade) likely help aerate flows and ensure that DO concentrations in the downstream reach remain high regardless of inflow. Accordingly, the Town's proposed 15 cfs minimum flow release would likely continue to result in water quality conditions favorable for aquatic life.

In summary, because: (1) flows to the bypassed reach are expected to remain unchanged from current conditions approximately 45% of the year; (2) the bypassed reach is short and approximately half is steep and provides limited aquatic habitat; (3) no unique/limiting aquatic habitat was identified in the bypassed reach; (4) increasing flows to the bypassed reach resulted in no consistent increase in aquatic habitat across species/life stages examined; and (5) water quality conditions are likely to remain favorable for aquatic life even under reduced flow, the Town's proposed 15-cfs minimum flow to the bypassed reach is unlikely to adversely affect

aquatic resources in the bypassed reach or downstream Little River relative to existing conditions.

Separate from the Town's 15 cfs proposal, we note that the Town's proposed normal maximum impoundment elevation is 636.0 feet and at that elevation, we estimate that approximately 44 cfs would spill over the spillway into the bypassed reach.[37] Because the Town proposes to maintain the normal impoundment elevation at the normal maximum elevation of 636.0 feet, the average flow released to the bypassed reach would be approximately 44 cfs under normal operating conditions, which would provide similar levels of suitable habitat availability as the 48.6-cfs flow that was analyzed in the Instream Flow Study.[38]

Impoundment Drawdowns and Refills

Under current conditions, most inflow passes over the partially breached spillway of the existing dam at an impoundment surface elevation of approximately 634.4 feet.[39] The Town proposes to construct the project facilities described in section 2.2.1, *Project Facilities*. The Town proposes to draw down the impoundment from a water surface elevation of 634.4 to 627.0 feet to provide access to the dam for modification for approximately 6 months during construction. Following construction, the Town would refill the impoundment to a water surface elevation of 636.0 feet.

Following construction, the Town proposes to operate the project in a run of river mode by maintaining a normal maximum impoundment surface elevation of 636.0 feet. The Town is not proposing any specific impoundment drawdowns after the project is operational, but drawdowns could periodically occur for maintenance and/or emergencies associated with project facilities.

To protect aquatic resources during impoundment drawdowns and refills, the Town proposes to implement drawdown and refill procedures included in the Flow Management Plan. Specifically, to refill the impoundment following construction, the Town proposes to: (1) increase the impoundment surface elevation by no more than 1 foot per day; and (2) maintain a minimum downstream flow of 15 cfs or, if inflow is less than 15 cfs, retain no more than 10% of inflow. For planned maintenance after the project is operational, the Town proposes to: (1) during impoundment drawdowns, lower the impoundment surface elevation by no more than 1

[37] Staff estimated the flow released from the spillway using the broad-crested weir equation ($Q = C \times L \times H^{3/2}$), in which the weir flow (flow released from the spillway) in cfs (Q) is dependent on the coefficient of discharge (C) (assumed to be 3.1), the length of the weir (spillway) in feet (L), and the upstream head (depth of spill over the spillway) in feet (H).

[38] As discussed, minimum flow to the bypassed reach is estimated to be approximately 44 cfs at an impoundment elevation of 636.0 feet. By providing a minimum flow of 44 cfs, staff estimate that the project would be inoperable approximately 59% of the time (i.e., flows would be unchanged from current conditions).

[39] Some small amount of unregulated flow is conveyed through the low-level outlet gates and possibly the existing tailrace channel.

foot per day or 0.5 inch per hour; and (2) during impoundment refills, increase the impoundment surface elevation by nor more than 1 foot per day or 0.5 inch per hour, and maintain a minimum flow of 15 cfs through the low-level outlet gate to the bypassed reach.

No entity provided comments or recommendations impoundment drawdown and refill procedures in response to the Commission's REA notice.

Our Analysis

The procedures that are used to draw down an impoundment can significantly affect aquatic habitat and organisms in the impoundment. Dewatering aquatic habitat during a drawdown can impact the breeding, feeding, and sheltering of aquatic organisms. Stranding and desiccation can also occur during rapid drawdowns and result in mortality of fish and other aquatic organisms. Freshwater mussels, given their limited mobility, are particularly vulnerable to drawdowns as they may not be able to relocate to wetted habitat or burrow quickly enough to avoid desiccation as water levels recede.

Construction

The Town does not propose any specific drawdown limits while lowering the impoundment for project construction but indicates that the drawdown will be conducted "slowly" to minimize the potential for sedimentation. As discussed in section 3.3.2,1 *Aquatic Resources, Aquatic Organisms*, no mussel surveys have been conducted in the project area. However, the majority of mussel species in Vermont are found within the Lake Champlin drainage, which includes the project area, and the state listed endangered eastern pearlshell is known to occur downstream in the Winooski River. Given the extent (approximately 6.5 feet) and duration (approximately 6 months) of the proposed impoundment drawdown for construction, only mussels in or near the thalweg (i.e., lowest elevation) of the river channel would be expected to survive impoundment dewatering, regardless of the drawdown rate (Gough et al., 2012; Galbraith et al., 2015). To reduce the effects of project construction on freshwater mussels, the Town could develop a pre-construction mussel survey and relocation plan in consultation with FWS and Vermont ANR, including the following provisions: (1) survey the impoundment for freshwater mussels prior to the impoundment drawdown for construction; and (2) if mussels would be stranded during the impoundment drawdown, then develop procedures for relocating mussels to areas that would remain wetted during the drawdown.

During the drawdown for project construction, any fish in the impoundment are likely to move upstream to seek deeper waters as water levels in the impoundment recede. Because fish are generally capable of rapid movement, lowering the impoundment by releasing flows through the north low-level intake gate would not likely result in fish stranding. Nearshore spawning and foraging habitat could be adversely affected by impoundment dewatering, depending on when the impoundment drawdown occurs. Given the substrate of the impoundment (mostly sand and silt), spawning habitat for trout species in the impoundment is likely limited. Smallmouth bass and pumpkinseed generally spawn from April through June in Vermont and suitable spawning substrate may exist within the impoundment, particularly at the upstream end. As a result, the impoundment drawdown for project construction may occur during at least part of the spawning season. However, given the small size of the impoundment, temporary nature of the construction

drawdown (i.e., one spawning season), and lack of unique habitat (e.g., limited vegetation and silty substrate), dewatering is not likely to significantly affect fish populations, as they would likely recolonize the impoundment quickly following construction.

Retaining all inflow to refill the impoundment after an impoundment drawdown would adversely affect aquatic resources by dewatering aquatic habitat in the bypassed and downstream reaches, potentially stranding fish, mussels, and other aquatic organisms. On the other hand, releasing all flows downstream would adversely affect aquatic life in the impoundment by sustaining dewatered conditions. To refill the impoundment following the drawdown for construction, the Town proposes to increase the impoundment surface elevation by no more than 1 foot per day and maintain a minimum downstream flow of 15 cfs or, if inflow is less than 15 cfs, retain no more than 10% of inflow to fill the impoundment (i.e., pass 90% of inflow downstream). Given the small size and shallow depth of the impoundment, the water surface elevation of the impoundment can change quickly with even a small amount of water retained for refill. For example, the Town's proposal to refill the impoundment by no more than 1 foot per day, would equate to retaining approximately 0.9 cfs to refill the impoundment and passing all remaining inflow downstream.[40] As a result, the Town's proposal to refill the impoundment no more than 1 foot per day would generally set the limiting rate for refilling the impoundment, not the proposal to provide a minimum flow of 15 cfs downstream (i.e., flows passed downstream would exceed 15 cfs when inflow to the project is greater than 15.9 cfs). Implementing the Town's proposed refill procedures would ensure that the impoundment is refilled in a timely manner and that there are minimal disruptions to downstream flows.

The Town's proposal to refill the impoundment with a maximum of 10% of inflow if inflow to the project is less than 15 cfs would not likely be implemented during normal environmental conditions. Based on inflow data from 2017 through 2024, flows during normal environmental conditions exceed 15 cfs in all months, with low flow (90% exceedance flows) of 17 cfs in September and the lowest average flow of 67 cfs in September. However, to the extent inflow is less than 15 cfs during the impoundment refill, implementing the Town's proposed refill procedures would also ensure that the impoundment is refilled in a timely manner and that there are minimal disruptions to downstream flows.

Regardless of the refill scenario (i.e., 1 foot per day or 10% of inflow, if inflow is less than 15 cfs), the impoundment would likely be refilled following construction in less than 7 days and a minimum of 90% of inflow would be passed downstream at all times. Therefore, implementing the Town's proposed refill procedures would minimize the effects of the impoundment refill on aquatic resources.

[40] Based on the gross volume of the proposed impoundment (i.e., 10.4 acre-feet, or 453,024 cubic feet) and an average impoundment depth of 5.9 feet (10.4 acre-feet [storage capacity]/1.75 acres [impoundment acres] = 5.9 feet), we estimate that flow required to refill the impoundment 1 foot per day would be approximately 0.9 cfs.

Operation

The Town's proposal to lower the impoundment surface elevation by no more than 1 foot per day for planned maintenance would reduce the potential for fish stranding during planned drawdowns. In contrast to the drawdown for project construction, any planned maintenance drawdowns are likely to be short in duration and are unlikely to require complete dewatering of the impoundment. Therefore, the Town's proposed drawdown rate would help ensure that planned maintenance drawdowns have minimal effects on mussels, if any, in the impoundment.

The Town's proposed refill procedure for planned maintenance would be the same as the refill procedure following project construction, except that the Town does not propose an alternative refill procedure when inflow is less than 15 cfs. For refills associated with planned maintenance, the Town is proposing to maintain a 15-cfs minimum flow release even when inflow is less than 15 cfs. However, if inflow is less than 15 cfs, then releasing a minimum flow of 15 cfs could rapidly lower the impoundment surface elevation instead of refilling the impoundment, which would dewater aquatic habitat. Implementing the same refill procedure following planned maintenance as described above for the construction drawdown (i.e., if inflow is less than 15 cfs, use no more than 10% of inflow to refill the impoundment) would help ensure that the impoundment is refilled in a timely manner and that there are minimal disruptions to downstream flows. Additionally, the Town has not proposed a refill procedure following unplanned drawdowns associated with maintenance and emergencies. To protect aquatic resources during impoundment refills associated with unplanned maintenance and emergencies, the Town could implement the following refill procedure after any drawdown: (1) if inflow is 15 cfs or greater, increase impoundment levels by no more than 1 foot per day or 0.5 inch per hour, and release a minimum flow of 15 cfs to the bypassed reach, as proposed by the Town; or (2) if inflow is less than 15 cfs, release 90% of inflow downstream to the bypassed reach and use 10% of inflow to refill the impoundment.

Operation Compliance Monitoring

The Town proposes to maintain run-of-river operation and minimum flows to the bypassed reach using headpond sensors.

No entity provided comments or recommendations on maintaining operational compliance in response to the Commission's REA notice.

Our Analysis

Although compliance measures do not directly affect environmental resources, they do assist the Commission with verifying that an exemptee is complying with the environmental requirements of an exemption from licensing. An operation compliance monitoring plan would help the Town document compliance with the operational requirements of any exemption from licensing and provide a mechanism for reporting deviations. An operation compliance monitoring plan would also help the Commission verify that the project is operating in a run-of-river mode, maintaining impoundment elevations, and releasing the required minimum flows, thereby facilitating administration of the exemption from licensing and assist with the protection of resources that are sensitive to deviations from normal operating conditions.

The plan could be developed in consultation with FWS and Vermont ANR, and include: (1) a detailed description of how the Town will maintain, monitor, and document compliance with the operational requirements of any exemption from licensing; (2) a description of the gages, sensors, and other measuring devices used to monitor compliance with the requirements of any exemption from licensing; (3) a schedule for installing any monitoring equipment needed to document compliance with the operational requirements of any exemption from licensing; (4) procedures for maintaining and calibrating monitoring equipment; and (5) standard operating procedures to be implemented outside of normal operating conditions, including procedures for deflating the rubber crest gate to manage flows during high flow events to minimize flooding upstream of the dam to the extent possible, and procedures for scheduled and unscheduled facility shutdowns. In addition, notifying the Commission of planned and unplanned deviations from run-of-river operation, impoundment elevation levels, and minimum flow requirements would ensure that the Town provides adequate information to the Commission throughout any exemption from licensing. Collectively, these measures would help ensure that the methods and protocols necessary for run-of-river operation are established and that downstream flow fluctuations are minimized.

Fish Impingement and Entrainment

As discussed above, the Town proposes to redirect flow from the impoundment through the powerhouse to generate hydroelectric power. The Town proposes to operate the project with a trashrack with 1-inch clear spacing.

No entity provided comments or recommendations on fish impingement or entrainment in response to the Commission's REA notice.

Our Analysis

As discussed in section 3.3.2.1, *Aquatic Resources, Aquatic Organisms,* the Little River in the project area is designated as cold water fish habitat and supports resident species such as rainbow trout, longnose dace, blacknose dace, white sucker, smallmouth bass, and pumpkinseed (Table C-5). These species utilize a variety of lotic and lentic habitats available in the existing impoundment and further upstream. Although resident fish in the project area do not require downstream passage to complete their life history requirements, they could still encounter the proposed project intake when foraging in the impoundment or seeking habitat. Water intake structures can injure or kill fish that encounter intake screens/trashracks. At hydropower projects, fish that pass through the intake(s) are also subject to potential turbine injury/mortality.

Fish that are wider than the clear spacing between the trashrack bars, and/or have burst swim speeds lower than intake velocities can become trapped against intake screens or bars of a trashrack. This process is known as impingement and can cause physical stress, suffocation, and death of some organisms (EPRI, 2003). Entrainment into the intake structure occurs if fish are small enough to pass between trashrack bars but are (1) unable to overcome the intake velocity or (2) choose to pass downstream through the trashrack. If entrainment occurs, injury or mortality can result from collisions with turbine blades, exposure to pressure changes, shear forces in turbulent flows, or water velocity accelerations created by turbines (Rochester et al., 1984). Fish that are entrained and killed are removed from the river population and no longer available for recruitment to the fishery.

The likelihood of a fish becoming impinged rather than entrained is a function of the spacing between the trashrack bars at the intake, as well as the size and body shape of fish. We used proportional measurements (length/width) for rainbow trout, white sucker, smallmouth bass, and pumpkinseed as reported by Smith (1985) to estimate the length of fish that would be physically excluded by the proposed trashrack.[41] These species were chosen because they are recreationally important species, were collected in multiple years near the proposed project, and/or were recommended for inclusion in the Instream Flow Study by Vermont ANR (Table C-5). Based on proportional measurements, rainbow trout, white sucker, smallmouth bass, and pumpkinseed less than 8.75, 7.17, 7.82, and 8.06 inches, respectively, would be able to physically pass through the 1-inch spacing between the trashrack bars. Larger fish would be physically excluded from passing through the 1-inch trashrack.

Even if fish are small enough to fit through trashrack, they are likely to behaviorally avoid entrainment and could escape entrainment if their burst speed is greater than the water velocity at the intake (Knapp et al., 1982). Fish are able to detect obstacles using stimuli such as flow acceleration, turbulence, and sound (Coutant and Whitney, 2000). As fish approach the intake and the trashrack, they sense flow acceleration near the trashrack and are likely to respond by swimming away from the intake at burst speed.

The burst speeds of rainbow trout, white sucker, smallmouth bass, and pumpkinseed at lengths potentially susceptible to impingement (i.e., body widths greater than 1 inch) are shown in Table C-6. Based on the dimensions of the trashrack and hydraulic capacity of the proposed turbine, staff estimated the intake velocity at the trashrack to be approximately 1.4 feet per second (fps).[42] Considering the low intake velocity at the trashrack, any rainbow trout, white sucker, smallmouth bass, and pumpkinseed large enough to be impinged on the trashrack would

[41] Staff used proportional measurements to calculate a scaling factor of body width to total length (scaling factor = width/total length), and then used the scaling factor to estimate the length that would be physically excluded by the 1-inch trashrack. For rainbow trout, white sucker, smallmouth bass, and pumpkinseed, we used scaling factors of 0.1143, 0.146, 0.1278, and 0.124, respectively.

[42] To estimate the flow velocity through the trashrack, Commission staff calculated the effective area in which flow could pass through the trashrack at the project. Specifically, staff accounted for the following parameters: (1) the effective intake width (17.9 feet), as calculated from (a) the clear bar spacing of the trashrack (1.0 inch) and (b) the number of bars necessary to span the 22.4-foot-wide trashrack (215 bars at a bar thickness of 0.25 inch); and (2) the effective intake height (5.9 feet), as calculated from an 11.5-foot intake opening (an 11.5-foot-tall trashrack with top elevation of 641.6 feet reduced by 5.6 feet to the normal maximum impoundment surface elevation of 636.0 feet). Staff calculated the velocity through the clear spaces of the trashrack by dividing the maximum hydraulic capacity of the turbine (150 cfs) by the effective area of the trashrack (105.7 ft^2). While the Town proposes to angle the trashrack approximately 15 degrees relative to inflow, staff estimated the intake velocity based on a trashrack oriented perpendicular to inflow as the difference in intake velocity between the two orientations at the proposed project is negligible.

be able to swim faster than the intake velocity and avoid impingement. Therefore, the potential for impingement of fish at the project is low.

Rainbow trout, white sucker, smallmouth bass, and pumpkinseed longer than 2.7, 2.7, 3.0 and 3.0 inches, respectively, could behaviorally avoid impingement and entrainment because their burst speeds exceed the maximum intake velocity at the trashrack (i.e., 1.4 fps) (Table C-6). Some small/young fish in the project impoundment would be susceptible to entrainment because they could fit through the 1-inch clear bar spacing of the trashrack and their burst speeds do not exceed the maximum intake velocity at the trashrack. For example, juvenile smallmouth bass less than 3 inches long have an estimated burst swim speed that is less than the maximum intake velocity of 1.4 fps at the trashrack. Therefore, smallmouth bass less than 3 inches in length would be susceptible to entrainment through the turbine.

Winchell et al. (2000) compiled turbine entrainment survival data to evaluate trends in survival related to fish size, turbine type, rotational speed, and hydraulic capacity. Winchell et al. (2000) found that fish 8 inches or less, make up over 90% of all entrained with fish 4 inches or less accounting for 71% or more of all entrained fish regardless of trashrack spacing. In addition, the study found that fish 4 inches or less passing through projects with axial-flow turbines (e.g., Kaplan turbine) would have minimum immediate survival rate of 81.3%.[43] As discussed above, small fish generally less than 3 inches long could be susceptible to entrainment at the proposed project. Therefore, some turbine passage mortality could occur for small fish.

Based on the above analysis, impingement potential at the proposed project is low because fish large enough to be impinged against the trashrack have burst swimming speeds greater than the intake velocity (i.e., they could swim away from the trashrack). Entrainment potential at the project is also low and would be limited to small fish, generally less than 3 inches long, that have high entrainment survival rates. Therefore, operation of the project, as proposed by the Town, would not significantly affect resident fish populations at the project.

[43] The proposed powerhouse would have one vertical Kaplan turbine and generator with a maximum hydraulic capacity of 150 cfs. The rotational speed of the proposed runner is unknown. Winchell et al. (2000) evaluated axial-flow turbines with hydraulic capacities of 530 cfs and rotational speeds of greater than 300 revolutions per minute (rpm); and with hydraulic capacities ranging from 636 cfs to 1203 cfs and rotational speeds less than 300 rpm. Immediate survival for these turbine/runner speed combinations ranged from 81.3% to 98%. Therefore, based on the maximum hydraulic capacity of the proposed project, the minimum immediate survival rate of entrained fish is estimated to be 81.3%. However, this may be a significant underestimation of actual survival rates because the runner speed at the proposed project is unknown and none of the estimates are based on turbines with similar, low hydraulic capacities.

3.3.3 Terrestrial Resources

3.3.3.1 Affected Environment

Vegetation

The Town conducted a Vegetative Cover and Wetland Resource Study in 2022 to describe vegetation and delineate wetlands within the project area. The study area encompassed the length of the proposed project boundary extending from approximately 200 feet downstream of the existing dam to approximately 1,500 feet upstream of dam. Vegetation downstream of Smith's Falls Dam and on the shoreline of the impoundment is dominated by broad-leaved deciduous mixed hardwoods with isolated coniferous trees. The riverbank downstream of the dam contains riprap, large boulders, and concrete debris with various tree, shrub, herbaceous, and grass species. The northern shoreline of the impoundment is steeply sloped and consists of maintained lawn around the Town's existing facilities and a narrow band of riparian vegetation. Upstream of the Moscow Road Bridge, the northern/eastern riverbank along the outside river bend is steeply sloped with exposed bedrock and various tree, shrub, herbaceous, and grass species. Further upstream, the eastern riverbank contains an agricultural floodplain meadow that is mowed annually for hay. The western riverbank along Moscow Road contains a narrow upland scrub shrub flood shelf with hardwood trees, shrubs, herbaceous species, ferns, and grasses.

Several invasive plant species were identified as part of the Town's Vegetative Cover and Wetland Resource Study, including: Japanese knotweed, Asiatic (oriental) bittersweet, Morrow's honeysuckle, and purple loosestrife (Vermont Agency of Agriculture, Food, & Markets, 2025). Additional species, including multiflora rose and reed canary grass, are present in the project area and on the Vermont Invasive Exotic Plant Advisory Committee (Vermont IEPAC) unofficial invasive species watch list.[44] The invasive species are often abundantly interspersed with native vegetation on the riverbanks downstream of the dam and on the shoreline of the proposed impoundment.

Wetlands

Wetlands are productive ecosystems that provide a variety of services such as improving water quality, providing fish and wildlife habitat, managing floodwaters, and providing flow during dry conditions. According to the FWS's National Wetlands Inventory (NWI), the Little River within the proposed project boundary is classified as a lower perennial riverine system that has an unconsolidated bottom and is permanently flooded (FWS, 2025).

As part of the Vegetative Cover and Wetland Resource Study, the Town identified 1.003 acres of wetlands within the project area, excluding the Little River and including palustrine

[44] The Vermont IEPAC was established by the State of Vermont to advise the Secretary of the Vermont Agency of Agriculture, Food and Markets on matters related to the addition and deletion of plant species to the noxious weed list (*See:* https://agriculture.vermont.gov/vermont-invasive-and-exotic-plant-advisory-committee; *See also:* https://www.vtinvasives.org/news-events/news/vermont%E2%80%99s-invasive-exotic-plant-watch-list).

emergent (wetland WA, 150 square feet, or 0.003 acre), palustrine alluvial scrub shrub/emergent wet meadow (wetland WB, 0.6 acre), and palustrine scrub shrub/palustrine emergent (wetland WZ, 0.4 acre) (Figure B-5). Wetland WA is located upstream of the existing sluiceway entrance and formed because of sediment accumulation behind the head gate of the existing sluiceway, which is non-functional due to inactivity and a lack of maintenance. Vegetation within this wetland includes broad-leaved cattail, purple loosestrife, soft rush, and reed canary grass. Wetland WZ is located south of the existing impoundment along Adams Mill Road and contains smooth alder, willow, American elderberry, meadowsweet, American cranberry, silky dogwood, wild grape, reed canary grass, joe pye weed, soft rush, jewelweed, green bulrush, and purple stemmed aster. Wetland WB is located along the northern river bank upstream of the Moscow Road Bridge and contains smooth alder, silky willow, and red osier dogwood, moneywort, forget-me-not, asters, bladder sedge, joe pye weed, American sweetflag, and sensitive fern.

Wildlife

Approximately 20 mammal species are likely to occur within the project area, including little brown bat, Virginia opossum, woodchuck, gray squirrel, eastern chipmunk, red fox, raccoon, black bear, coyote, white-tailed deer, muskrat, and beaver. Sixty-one bird species may occur in the area at various times throughout the year, including resident species, migratory waterfowl, and neotropical songbirds. Common bird species in the project area include mourning dove, American crow, black-capped chickadee, and American goldfinch. Approximately 18 herptiles (11 amphibians and 7 reptiles) are common to the area, including American toad, common garter snake, snapping turtle, wood frog, eastern painted turtle, and northern leopard frog. There are no known occurrences of state listed rare, threatened, endangered, or uncommon species in the project area. The uncommon wood turtle is a Vermont Species of Greatest Conservation Need and has been documented in the floodplain of the Little River approximately 1.5 miles from the proposed project area (Vermont FWD, 2015).

3.3.3.2 Environmental Effects

Project Construction

The Town proposes to construct the project facilities described in section 2.2.1, *Project Facilities*. The Town proposes to draw down the impoundment from a water surface elevation of 634.4 feet to 627.0 feet to provide access to the dam for modification for approximately 6 months during construction.

To access the project construction site from the south, the Town proposes to construct a temporary road and staging area that extends north approximately 125 feet off Adams Mill Road down to the existing impoundment shoreline. Access would continue approximately 200 feet through the dewatered river channel along the dam to make the repairs. Approximately 300 and 350 square feet of upland and wetland/river habitats, respectively, would be temporarily disturbed while using the south access area. To reduce the effects of project construction on upland and wetland habitats in access areas, the Town proposes to place a geotextile fabric membrane over existing topsoil and vegetation and to cover the membrane with gravel. Timber matting would be used within the river/wetland areas to protect existing soils. Following construction, the Town proposes to remove the access road, gravel, geotextile fabric, and timber matting and restore disturbed areas with native upland and wetland seed mixes. To access the

project construction site from the north for construction/modification of the intake structure, sluiceway, powerhouse, and tailrace, the Town proposes to use an existing paved parking area and the maintained lawn/landscaped area between the parking area and dam. Approximately 6,760 square feet of upland areas, primarily a paved parking area and maintained lawn, would be used for access and staging. The Town proposes to repair the lawn area as needed following project construction.[45]

Construction of the intake structure and sluiceway would involve clearing vegetation in an area of approximately 975 square feet located along the northeast corner of the mill building. Approximately 150 square feet of wetlands would be permanently removed from the existing intake for project construction. Construction of the proposed powerhouse and restoration of the tailrace area would involve clearing existing vegetation in an area of approximately 4,100 square feet located immediately west of the mill building. An estimated 870 square feet of existing lawn would be temporarily disturbed to construct the underground transmission line. Approximately 11 trees and 2 lilac bushes would be removed from areas around the existing mill building. The Town proposes to replant 4 landscape trees and 1 lilac bush following project construction.

To provide recreation opportunities at the proposed project, the Town proposes to develop an approximately 485-foot-long fishing and boating access trail around the dam from the north shoreline of the impoundment to downstream of the tailrace, and associated access sites on the shoreline of the impoundment and the riverbank downstream of the tailrace. Most of the trail would be located over existing mowed or paved areas. Metal or rock steps would be added at the access sites. Approximately 1,000 square feet and 1,500 square feet of existing vegetation would be disturbed at the impoundment and downstream access sites, respectively. The Town proposes to revegetate all disturbed areas with native vegetation following construction.

To reduce the spread of invasive species during construction, the Town proposes to implement the Invasive Species Plan, filed as Appendix L of the exemption application, including the following measures: (1) identify and use staging areas that are free of invasive species; (2) move from areas with no invasive species to areas with invasive species, when possible; (3) clean all equipment prior to moving from areas with invasive species to areas without invasive species; (4) limit removal of excavated material from sites with invasive species; (5) destroy or dispose of invasive species from any excavated material; and (6) cover soils containing invasive species during transport.

No entity provided comments or recommendations on the effects of project construction on terrestrial resources in response to the Commission's REA notice.

[45] The Town's proposed measures are generally consistent with Corps Vermont General Permit conditions 24 and 26.

Our Analysis

Effects of Construction on Upland Habitat

Construction of the project would result in some temporary and permanent alteration/removal of small areas of upland habitat. These activities could adversely affect vegetation and wildlife through degradation of habitat or direct mortality through interactions with construction equipment. As described above, these effects would occur in the south access area; around the existing dam and mill building; and along the fishing and boating access trail. The total disturbed area is estimated to be 9,245 square feet (0.21 acre).

The Town's proposed restoration and mitigation measures (e.g., geotextile fabric, timber matting, reseeding with native vegetation) would reduce project effects on erosion and sedimentation (as discussed in section 3.3.1, *Geology and Soils*), and ensure that disturbed areas are restored to current conditions. As discussed above in section 3.3.3.1, several invasive species are known to occur in the project area. The Town's proposed Invasive Species Plan would reduce the potential for project construction to spread invasive species.

Some of the proposed construction activities are not fully described (i.e., tailrace and transmission line construction and shoreline protection), or remain in the conceptual phase (e.g., fishing and boating access trail) and are subject to change as designs are finalized. Development of a construction vegetation management plan would ensure that wildlife habitats are restored at disturbed sites in a timely manner. The plan could be developed in consultation with FWS and Vermont ANR and include the following provisions: (1) revegetating project construction areas and restoring the pre-construction elevations and contours of land within 30 days of completing work in the areas; (2) a description of the project construction areas to be revegetated following construction, including acreages, topography, soil types, and existing vegetation; (3) a description of the measures to be taken to revegetate disturbed areas with native vegetation and seed, as proposed by the Town; (4) a description of the techniques and BMPs to be used to control the establishment, reintroduction, and spread of non-native invasive plants until disturbed areas are successfully revegetated, as proposed by the Town in the Invasive Species Plan; (5) a 2-year post-construction monitoring period that includes criteria for measuring the success of revegetation efforts and invasive species control efforts, and a description of procedures to be followed if monitoring shows that revegetation or invasive species control measures are not successful; (6) a schedule for filing reports on the progress of revegetation with the Commission; and (7) an implementation schedule that provides a timeline for initiating and completing construction-related vegetation management activities within disturbed areas.

As discussed in section 3.3.6, *Cultural Resources,* much of the project area located on the north side of the dam was recently cleared and graded from 2018-2019 for construction of the Town office and garage buildings. As a result, much of the upland habitat in and adjacent to where the proposed project would be constructed has been recently disturbed and revegetated. Because the proposed project occurs in a developed area, wildlife species inhabiting the proposed construction area primarily consist of common species (e.g., squirrels, frogs, upland birds, and waterfowl). A small amount of upland habitat (approximately 5,100 square feet, or 0.12 acre) would be permanently lost as a result of project construction. However, considering the scale, quality, and location of upland habitat that would be lost, construction would not significantly affect wildlife populations in the project area.

Effects of Construction on Wetlands and Riparian Habitats

As discussed above, construction of the project would result in the loss of an approximately 150 square feet palustrine emergent wetland (wetland WA) that was formed by sediment deposition at the existing sluiceway intake. Given the artificial nature and small size of the wetland, it does not provide a significant wetland function (e.g., flood control, water filtration, erosion control, habitat, etc.). Additionally, the wetland provides limited unique/valuable habitat as it is colonized by invasive/potentially invasive species including purple loosestrife and reed canary grass. While loss of this wetland would displace any species currently inhabiting it, the small size and lack of unique habitat make it unlikely that loss of the wetland would have a significant effect on wildlife or habitat.

The Town proposes to temporarily access the river channel through riparian habitats on the north and south ends of the existing dam. Additionally, the Town proposes to develop recreation access to the river both at the upstream and downstream fishing and boating access sites. Approximately 450 square feet of riparian habitat would be permanently removed (i.e., recreation access stairs) and 2,500 square feet of riparian habitat would be temporarily disturbed as result of project construction. Developing an erosion and sediment management plan, as discussed in section 3.3.1, *Geology and Soils,* that includes the Town's proposals to protect soil and vegetation with geotextile fabric and timber matting would minimize the effects of construction on existing riparian habitat. Development of a construction vegetation management plan, as discussed above, would ensure that areas disturbed by construction activities are rehabilitated and revegetated successfully and in a timely manner.

The wood turtle is a Vermont Species of Greatest Conservation Need and has been identified within the floodplain of the Little River. Wood turtles are primarily found near forested streams in which they hibernate during the winter. They prefer undercut banks and/or exposed shorelines for sunning and foraging. As discussed above, the majority of project construction would occur in the immediate vicinity of the existing dam, on lands previously disturbed. Given the limited size and suitability of habitat where project construction would occur, construction of the project would likely have no effect on wood turtle should they be found within the proposed project boundary.

Project Operation and Maintenance

Under current conditions most inflow passes over the partially breached spillway of the existing dam at an impoundment surface elevation of approximately 634.4 feet. The Town proposes to release flow from the new intake structure to the powerhouse to generate hydroelectric power, which would divert flow from the spillway and create a 170-foot-long bypassed reach. The Town proposes to operate the proposed project in a run of river mode by maintaining a normal maximum impoundment surface elevation of 636.0 feet. The Town also proposes to release a minimum flow of 15 cfs or inflow, whichever is less, to the bypassed reach at all times.

The Town currently maintains vegetation (i.e., mows the lawn) within a small portion of the proposed project boundary, around the existing administrative building, on a seasonal basis. The Town proposes to continue mowing lawn areas throughout the spring and summer months.

Additionally, the Town proposes to maintain a mowed path along the proposed fishing and boating access trail once a month from June 1 to October 1 following construction.

To control invasive species associated with recreation use at the project, the Town proposes to implement the Conceptual Recreation Plan filed as Appendix I of the application on November 25, 2024, including manual, mechanical, and herbicide control methods throughout the operation of the project.[46]

No entity provided comments or recommendations on the effects of project operation and maintenance on terrestrial resources in response to the Commission's REA notice.

Our Analysis

Modifying the existing dam would increase the surface elevation of the impoundment by approximately 1.6 feet, which would affect a narrow band of riparian habitat along the impoundment to varying degrees. Areas closest to the dam would incur slight impacts due to the submergence of additional land and riparian vegetation. Riparian areas further upstream from the dam are expected to experience negligible effects because water level changes would be minimal. These small, submerged areas may exhibit changes in vegetative species that are more adapted to the increased water levels (i.e., hydrophytic vegetation).

Operating the project in a run-of-river mode would maintain stable impoundment levels and minimize effects on terrestrial habitat along the project impoundment. Downstream of the bypassed reach, the Town's proposed run-of-river operation would result in a downstream flow regime that is similar in magnitude and timing to natural river flows, thereby minimizing project effects on the Little River downstream of the project. The Town's proposal to release a minimum flow of 15 cfs or inflow, whichever is less, to the bypassed reach would provide wetted conditions for wildlife, but project operation would result in decreased water levels when the turbine is operating. However, as discussed in section 3.3.2, *Aquatic Resources,* the proposed bypassed reach is short and, based on hydraulic conditions at the site, flows would be unchanged approximately 45% of the time (i.e., all inflow would spill over the spillway). Therefore, the reduced flow in the bypassed reach would not likely significantly affect wildlife or habitat.

Maintaining mowed areas associated proposed project facilities, including the recreation facilities, would not significantly affect wildlife or terrestrial habitat. Implementing the invasive species control measures proposed by the Town in the Conceptual Recreation Plan would minimize the potential for project recreation to spread invasive species and affect wildlife habitat.

[46] The Town's proposed measures are generally consistent with Corps Vermont General Permit conditions 24 and 26.

3.3.4 Threatened and Endangered Species

Section 7 of the ESA[47] requires federal agencies to ensure their actions are not likely to jeopardize the continued existence of any federally listed endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species. According to FWS's Information for Planning and Consultation (IPaC) system, the federally listed endangered NLEB (*Myotis septentrionalis*) and the proposed threatened monarch butterfly (*Danaus plexippus*) have the potential to occur at the project.[48] There is no proposed or designated critical habitat for these species in the project area.

Our analyses of project effects on the NLEB and monarch butterfly are presented in Appendix E, *Biological Assessment*. Based on the available information, we conclude that constructing and operating the project would not likely adversely affect the NLEB or jeopardize the continued existence of the monarch butterfly.

3.3.5 Recreation, Land Use, and Aesthetic Resources

3.3.5.1 Affected Environment

The proposed project boundary encloses approximately 3.3 acres, as described in section 2.2.2, *Project Boundary*. Land in the project area consists of mixed-use, including residential, commercial, agricultural, and forests.

There are numerous recreation opportunities near the project including, but not limited to, camping, boating, fishing, swimming, hiking, biking, skiing, snowshoeing, and wildlife viewing. Moscow Recreation Field, owned and maintained by the Stowe Land Trust, is located on the north side of the riverbank approximately 0.3 mile downstream of the project and provides access to the Little River and opportunities for hiking, fishing, swimming, boating, and nordic skiing (Stowe Land Trust, 2025). DuMont Meadow, also owned and maintained by the Stowe Land Trust, is located on the south side of the riverbank across from Moscow Recreation Field and provides opportunities for hiking, biking, snowshoeing, and skiing. Waterbury Reservoir is located approximately 2.5 miles downstream of the project and is the ninth largest body of water in Vermont. The Waterbury Reservoir area includes Little River State Park, Blush Hill Boat Launch, Waterbury Reservoir Boat Launch, and Waterbury Center State Park. These recreation sites are maintained by Vermont ANR and provide a variety of opportunities such as boating, camping, swimming, fishing, hiking, and biking.

The Town does not maintain any recreation sites in the proposed project boundary, but fishing occurs on the Town's property below the dam. Fishing by private landowners is available from the shoreline of the existing impoundment and the riverbanks downstream of the dam. Also, there is potential for the public to canoe/kayak within the Little River, but private landowner permission is currently required for put-ins and take outs.

[47] 16 U.S.C. § 1536.

[48] *See* Commission staff's June 10, 2025, Memorandum on Endangered Species Act List.

3.3.5.2 Environment Effects

Recreation

The Town proposes to construct the project facilities described in section 2.2.1, *Project Facilities*. The Town proposes to draw down the impoundment from a water surface elevation of 634.4 feet to 627.0 feet to provide access to the dam for modification for approximately 6 months during construction.

The Town proposes to release flow from the new intake structure to the powerhouse to generate hydroelectric power, which would divert flow from the spillway and create a 170-foot-long bypassed reach. The Town proposes to operate the proposed project in a run of river mode by maintaining a normal maximum impoundment surface elevation of 636.0 feet. The Town also proposes to release a minimum flow of 15 cfs or inflow, whichever is less, to the bypassed reach at all times.

The Town filed a Conceptual Recreation Plan on November 25, 2024 that includes the following recreation facilities: (1) a 1,000-square-foot hand-carry boat access site on the north shoreline of the impoundment approximately 185 feet upstream of the dam; (2) a 485-foot-long fishing and boating access trail around the north side of the dam; and (3) a 1,500-square-foot hand-carry boat and fishing access site on the north riverbank approximately 70 feet downstream of the tailrace. The Town proposes to install five directional signs for the access trail. The Town proposes vegetation maintenance along the trail, including mowing, planting native vegetation, and controlling invasive species.[49]

No entity provided comments or recommendations on recreation in response to the Commission's REA notice.

Our Analysis

Project construction would require an impoundment drawdown that would eliminate fishing and boating opportunities in the proposed impoundment and bypassed reach for about 6 months. Boating opportunities would return immediately after the impoundment is refilled. As discussed in section 3.3.2.2, *Aquatic Resources, Impoundment Drawdowns and Refills*, fish populations would likely recolonize the impoundment quickly following construction and there would be no long-term effect on fishing opportunities in the project boundary.

Following construction, the Town's proposed run-of-river operation would maintain stable impoundment water levels and downstream flows that are favorable for water-based recreation activities, including fishing and boating upstream and downstream of the project.

As discussed above, many land and water-based recreation opportunities exist in the project vicinity. However, there are no designated fishing or boating access sites for the impoundment or the Little River between the Smith's Falls Dam and Moscow Field. The

[49] Staff's analysis of the Town's proposal to maintain vegetation in the project boundary is in section 3.3.3.2, *Terrestrial Resources*, *Project Operation and Maintenance*.

Town's proposed impoundment and river access sites would benefit the public by providing access to the impoundment and the Little River for fishing and boating. The Town's proposed trail would ensure that recreation users can safely access the impoundment and river sites. The trail would also provide an opportunity for boaters to portage hand-carry boats around the dam. The Town's proposed directional signage would ensure that recreation users are able to identify access points and follow the trail.

The Conceptual Recreation Plan should be finalized prior to construction. It currently includes multiple options for portage signs (single posts, informational maps), trail markings (painted, stone), and staircases (metal, wood, rock). The materials, dimensions, and locations of the staircases, signage, and trail markings should be specified in the final recreation plan. The Conceptual Recreation Plan also shows that a "Portage Ahead" sign would be installed on the shoreline of the impoundment upstream of Moscow Road Bridge. Based on the Exhibit G map filed on November 25, 2024, this sign would be located on private property outside of the project boundary. The sign could be installed on property owned by the Town and in the proposed project boundary, immediately downstream of Moscow Bridge. Also, the Town proposes to route the trail through an existing parking lot that is used to access office and apartment buildings. To ensure public safety, the trail should be clearly marked so no vehicles are parked or operating on the trail where recreation users could be carrying boats. In addition, to ensure vehicular access for recreation users, the Town could designate at least three parking spots for vehicles for recreation access and mark the spots with signs. Finally, with increased public use associated with the proposed project recreation facilities, installing a portable toilet adjacent to the parking lot would help maintain aesthetic and sanitary conditions at the project.

Developing a recreation management plan with the following provisions would enhance recreation opportunities at the project: (1) a description of the proposed recreation facilities and signage, including the materials, locations, and dimensions of the recreation facilities and associated amenities; (2) installation of a "Portage Ahead" sign on land owned by the Town in the project boundary (e.g., on the south shoreline of the impoundment, immediately downstream of the Moscow Road Bridge); (3) installation of a portable toilet adjacent to the parking lot; (4) marking the trail within the parking lot; (5) designating three parking spots with signage for vehicles for recreation access; (6) a map showing the location of the recreation facilities proposed in the Conceptual Recreation Plan, and portable toilet and parking spots; (7) a construction, operation, and maintenance schedule for the recreation facilities; (8) a description of maintenance activities and vegetation management at the recreation facilities; and (9) filing a report with the Commission every 10 years to assess the condition and adequacy of the recreation facilities.

Land Use

The proposed project boundary encloses approximately 3.3 acres, including: (1) a 1.75-acre impoundment; (2) 1.05 acre of land associated with the project facilities described in section 2.1.1*, Project Facilities*; (3) 0.44 acre of land adjacent to the southern shoreline of the impoundment; and (4) 0.06 acre of land associated with an apartment building adjacent to the north shoreline of the impoundment.

The Town proposes to construct the project facilities described in section 2.2.1, *Project Facilities*. The Town proposes to draw down the impoundment from a water surface elevation of 634.4 to 627.0 feet to provide access to the dam for modification for approximately 6 months during the construction. Following construction, the Town would refill the impoundment to a water surface elevation of 636.0 feet.

In comments filed on November 18, 2024, the Adams state that increasing the impoundment elevation as proposed could exacerbate shoreline erosion and adversely affect the value of their property in the future.

Our Analysis

Land Use

The Adams state that increasing the impoundment elevation as proposed could exacerbate shoreline erosion and adversely affect the value of their property in the future. As discussed in section 3.3.1.2, *Geology and Soils, Impoundment Shoreline Erosion*, the northern and eastern shoreline of the existing impoundment is actively eroding (Figure B-2). Increasing the normal surface elevation of the impoundment from the current elevation of 634.4 to the historic elevation of 636.0 feet, as proposed, would inundate land on the shoreline that is not currently inundated. Altering the location of the water-soil interface on the northern and eastern shoreline of the impoundment has the potential to shift the erosion that is already occurring on the impoundment shoreline to the newly inundated area. As discussed in section 3.3.1.2, surveying the impoundment shoreline for erosion following project construction would ensure that the Town can identify the location of any erosion occurring as a result of increasing the impoundment elevation to the historic elevation and identify what measures could be implemented to reduce or eliminate any newly eroded areas. As discussed in section 3.3.1.2, developing a shoreline erosion and sediment control plan with the following provisions would ensure that any new erosion caused by restoring the impoundment surface elevation to historic levels is identified in a timely manner: (1) a description of methods for documenting impoundment shoreline erosion prior to construction and within 2 years after the project commences operation, to determine the extent and magnitude of any project-induced erosion (i.e., erosion occurring in new areas resulting from increasing the impoundment surface elevation from 634.4 feet to 636.0 feet); (2) consultation with FWS and Vermont ANR on repairs at any sites of project-induced erosion and measures to prevent further project-induced erosion (e.g., placing riprap or installing a gabion wall on project land at the erosion site); and (3) a report to be filed with the Commission by March 1 of the year following the second erosion survey, including: (a) the results of the two erosion surveys, descriptions of the erosion (elevation, length, severity), and maps depicting the extent of erosion along the shoreline; (b) conclusions regarding the cause of any new erosion following project construction, including whether increasing the impoundment elevation resulted in any new erosion; (c) any proposed measures for repairing project-induced erosion and preventing further project-induced erosion; and (d) documentation of consultation with the agencies. The Commission would review the report to determine whether any project-induced erosion occurs after the impoundment elevation is restored to the historic elevation and whether any measures could be implemented to repair project-induced erosion and prevent further project-induced erosion. These measures would minimize the effects of project construction on land use.

As discussed in section 3.3.2.2*, Aquatic Resources, Project Construction and Operation*, increasing the height of the dam and normal maximum surface elevation of the impoundment could increase the potential for upstream flooding during periods of high flow if greater volumes of water are not able to be passed downstream. Additional flooding upstream of the dam would affect properties adjacent to the impoundment, in the absence of flood control operations. However, the Town states that during high flows or potential flooding, it would deflate the rubber crest gate to an elevation of 632.8 feet to pass a greater volume of water downstream relative to existing conditions, where the spillway crest elevation is fixed and ranges from 634.5 to 635.9 feet, and the breached section has a minimum crest elevation of 633.5 feet. Because a greater volume of water could be passed downstream following the installation of the rubber crest gate, the proposed project would reduce the frequency and magnitude of upstream flooding. As discussed in section 3.3.2.2*, Aquatic Resources, Operation Compliance Monitoring*, the Town could develop an operation compliance monitoring plan that, among other things, includes procedures for deflating the rubber crest gate to manage flows during high flow events to minimize flooding upstream of the dam to the extent possible.

Project construction could temporarily restrict access to the Town's office building and an apartment building that shares the parking lot with the office building. For approximately 6 months during construction, the public would not be able to use the existing parking lot, but could park along an existing access road for the Town's non-project facilities, approximately 75 feet from the parking lot.

Project Boundary

According to the Commission's regulations, project boundaries should enclose "only those lands necessary for operation and maintenance of the project and for other project purposes, such as recreation, shoreline control, or protection of environmental resources."[50]

The Town proposes to maintain the normal maximum surface elevation of the impoundment at 636.0 feet. The Town states that the project would form a 1.75-acre impoundment at 636.0 feet. However, as discussed in section 3.3.1.2*, Geology and Soils, Project Operation*, erosion and sedimentation has significantly changed the river channel in recent years (Figure B-2), including the north bank of the river approximately 700 to 900 feet upstream of the dam. The east bank of the river would be the shoreline of the impoundment at the proposed normal maximum surface elevation of 636.0 feet. From satellite imagery, it is apparent that the proposed 1.75-acre impoundment does not accurately follow the existing shoreline and that the proposed project boundary does not include the entire surface area of the impoundment at the proposed normal maximum surface elevation of 636.0 feet (Figure 2). Although the license application includes georeferenced shapefiles of the contour elevation of 636.0 feet, the shapefiles appear to be based on outdated topographic data that do not reflect recent sediment deposition in the proposed impoundment or erosion on the impoundment shoreline. Without updated shapefiles and topographic data that reflect the existing condition of the shoreline, staff cannot accurately quantify the surface area of the impoundment at the normal maximum surface elevation of 636.0 feet. However, the entire impoundment is necessary for

[50] 18 C.F.R. § 4.41(h)(2) (2024).

project operation and maintenance and should be included in the project boundary. Therefore, the Town should revise the Exhibit G map and georeferenced shapefiles to enclose the entire water surface area of the impoundment at the proposed normal maximum surface elevation of 636.0 feet in the project boundary.[51]

The following land that the Town proposes to include in the proposed project boundary would be needed for project operation and maintenance: (1) 1.05 acre of land associated with the project facilities described in section 2.1.1, *Project Facilities*; and (2) 0.44 acre of land adjacent to the southern shoreline of the impoundment.

The apartment building located immediately upstream of the dam would not be used for project purposes. Therefore, inclusion of the 0.06 acre of land associated with the apartment building in the proposed project boundary does not appear to be warranted.

In summary, the project boundary should be modified to include the entire water surface area of the impoundment at the proposed normal maximum surface elevation of 636.0 feet and exclude 0.06 acre of land associated with the apartment building.

Aesthetic Resources

The Town proposes to construct the project facilities described in section 2.2.1, *Project Facilities*. The Town proposes to draw down the impoundment from a water surface elevation of 634.4 to 627.0 feet to provide access to the dam for modification for approximately 6 months during the construction. To reduce the effects of project construction on aesthetic resources, the Town proposes to: (1) limit all non-emergency outdoor lighting between the hours of 6:00 p.m. and 7:00 a.m. to only motion-activated lighting; (2) restrict all construction to the hours of 7:00 a.m. to 7:00 p.m. Monday through Friday, and 8:00 a.m. to 5:00 p.m. on Saturdays; and (3) prohibit construction on Sundays and state and federal holidays.

Following construction, the Town would refill the impoundment to a water surface elevation of 636.0 feet. The Town proposes to operate the project in a run-of-river mode by maintaining a normal maximum impoundment surface elevation of 636.0 feet and a minimum flow of 15 cfs or inflow, whichever is less, from the spillway to the bypassed reach at all times.

No lands in the immediate vicinity of the project are included in the national trails system, nor are there any designated wilderness lands. The Little River is not on the list of wild and scenic rivers.

[51] The Adams assert that the Town has not established flowage rights on land that the Adams own in the proposed impoundment. *See* April 2, 2025, Comments. Specifically, the Adams note that a flowage easement over their property might exist but claim that the Town has not identified such easement. However, based on documentation filed by the Town, the Town has all of the real property interests in lands necessary to develop and operate the project, either by owning in fee or holding flowage easements.

Our Analysis

A short-term increase in traffic, noise, dust, and visual disturbance would occur for 6 months during construction of the project facilities, that could affect noise and visual aesthetics for the public using the Town's office building, apartment building, and residential houses and commercial developments located near the project construction site on Moscow Road, Adams Mill Road, and Smith Falls Lane. Lowering the impoundment for 6 months during project construction would result in a visual effect on aesthetic resources. These effects would be temporary and aesthetic resources would be restored once the impoundment is refilled and flow over the spillway resumes.

Limiting the use of non-emergency outdoor lighting, as proposed by the Town, would help mitigate the effects of bright lighting during night hours on the surrounding community (e.g., sleep disturbance). Additionally, the proposed construction schedule would ensure that construction activities are completed during working hours when fewer residences are expected to be disturbed by any increase in traffic, noise, dust, lighting, etc. Operating the project in a run-of-river mode would maintain the visual aesthetic of the dam and project area by ensuring that upstream and downstream water levels are similar to existing conditions. Collectively, some disturbance to the aesthetic setting of the project area is likely to occur during construction of the proposed project. However, any disturbance is likely to be temporary (i.e., during construction hours and the construction period) and would not have a long-term effect on the aesthetic setting of the project area.

3.3.6 Cultural Resources

3.3.6.1 Affected Environment

Cultural resources represent things, structures, places, or archaeological sites that can be either prehistoric or historic in origin. Pursuant to section 106 of the NHPA, the Commission must take into account whether any historic property within the proposed project's area of potential effects (APE) could be affected by the issuance of an exemption from licensing for the project.[52] The Town's proposed APE includes: (1) the proposed project boundary; (2) land around the impoundment extending laterally 33 feet beyond the project boundary, except on the western shoreline of the upper impoundment where the proposed APE only extends to the edge of Moscow Road;[53] (3) land and water approximately 200 feet downstream of the existing tailrace; (4) 10 architectural resources that contribute to the National-Register listed Moscow Village Historic District (District), including the mill building and Smith's Falls Dam that would be part of the project and 8 non-project facilities; and (5) 5 residential buildings outside of the

[52] *See* 36 C.F.R. § 800.16(d).

[53] The Town consulted with the Vermont DHP to select the 33-foot-wide parcel of land (i.e., 10-meter-wide parcel) around the impoundment.

project boundary that do not contribute to the District (Figure B-6). Vermont DHP concurred with the proposed APE on March 21, 2023, and January 13, 2025.[54]

Property History

The proposed project would be located at the site of the Alexander Seaver Sawmill (mill building), which was constructed in 1822 and expanded in 1840 with a grist mill operated on hydromechanical power with a timber crib dam. A machine shop, also known as the Smith Woodworking Factory, was constructed at the site in 1878. An office building was constructed in 1910 at the property. In 1918, the mill was refurbished and converted to generate hydroelectric power, and the timber crib dam was replaced with the current concrete dam. Hydroelectric power was generated between 1982 and 2003. The facility was damaged in 2003 during a flood and taken offline. After several years, turbines were reinstalled, and the facility came back online generating electricity until it was once again damaged and taken offline in 2011, when a spring flooding event and the late-August Tropical Storm Irene caused immense damage to the mill building and resulted in the spillway being breached to the existing minimum crest elevation of 633.5 feet. Episodes of flooding resulted in deterioration of the building's west foundation wall, which is currently stabilized using steel framing.

A second office building was constructed northeast of the mill building near Moscow Road in 1950 and is currently used for residential apartments. Two buildings (First Office and the Machine Shop) were demolished in 2018-2019 for the construction of the current Town office building and an adjacent storage building/garage and parking area.

Historic Properties

Architectural Resources

The Town conducted a desktop review, site visit, and eligibility assessment of architectural resources within the proposed APE in 2022 and 2023 (Figure B-6). All architectural resources identified in the proposed APE also occur within the boundaries of the District. The District was listed in the National Register on July 31, 2008, and is eligible under National Register Criteria A and C.[55]

The Town identified 10 architectural resources that contribute to the District and that have the potential to be directly or indirectly (e.g., visually) affected by project construction and operation, including the mill building and Smith's Falls Dam that would be part of the project

[54] *See* the Town's November 25, 2024, filing at Appendix E, Attachment 1 and January 22, 2025, filing.

[55] Per 36 C.F.R. § 60.4, National Register Criterion A is defined as having an association with events that have made a significant contribution to the broad patterns of our history. National Register Criterion C is defined as having distinctive characteristics of a type, period, or method of construction; that represent the work of a master; that possess high artistic values; or that represent a significant and distinguishable entity whose components may lack individual distinction.

and 8 non-project facilities (Table C-7). The District is in a rural setting along the Little River and is comprised of historic and industrial resources associated with the development of factories along the river (Johnson, 2007).

Archaeological Resources

The Town conducted an Archaeological Resources Assessment (ARA) between 2022 and 2023 that identified precontact archaeological sensitivity along portions of the proposed impoundment. The ARA did not identify any historic archaeological sensitivity associated with the mill building due to past grading and construction. The Town conducted a Phase I archaeological site identification survey of archaeologically sensitive areas between 2023 and 2024, including subsurface testing along the impoundment shoreline.[56] The survey did not identify archeological resources on the proposed impoundment shoreline, including where the shoreline is actively eroding. The Vermont DHP concurred with the Town's findings.[57]

3.3.6.2 Environmental Effects

The Town proposes to construct new facilities and modify existing facilities and land for the purpose of producing hydroelectric power. The proposal includes: (1) constructing a new powerhouse; (2) extending the existing sluiceway; (3) constructing a new sluiceway intake with trashrack; (4) tailrace channel improvements; (5) rehabilitation of the west foundation wall of the mill building; (6) repairing the Smith's Falls Dam and installing an inflatable rubber crest gate; (7) creation of temporary construction access and staging areas; and (8) landscaping and installation of rip rap. The Town also proposes to develop recreation facilities, including a hand-carry boat access site on the shoreline of the impoundment, a fishing and boating access trail around the dam, and a hand-carry boat and fishing access site on the riverbank downstream of the tailrace.

On September 3, 2024, Vermont DHP filed comments stating that cultural resources may be directly impacted by construction and operation of the project, including the mill building, existing hydropower infrastructure such as the dam and intake structure, the existing impoundment, and area of the Little River and lands where ground disturbance is proposed. Vermont DHP stated that the project may result in indirect (visual) effects to the District from: (1) installing a reinforced concrete cap and inflatable bladder system on top of the dam; (2) reconstruction of the existing intake on the north side of the Sever Sawmill building; and (3) construction of a new powerhouse adjacent to the mill building.

The Town proposes to develop an HPMP in consultation with the Vermont DHP to protect historic properties that are eligible for or listed on the National Register.[58] On January 22, 2025, the Town filed a section 106 consultation letter concluding that no archaeological

[56] A second revision to the Phase I archaeological site identification study was submitted to the Vermont SHPO on August 13, 2024. *See* Vermont SHPO September 3, 2024, Comments.

[57] *See* January 22, 2025, Filing at 13.

[58] *See* section 2.0 of Exhibit E of the application filed on November 25, 2024.

resources eligible for listing in the National Register are in the proposed APE. The Town proposes the following measures to minimize project effects on the District: (1) adding non-functional windows and doors to the west wall of the mill building to visually match historical configurations and appearance; (2) following guidelines[59] for rehabilitating historic buildings, repointing mortar joints, and preservation of historic concrete; and (3) designing the powerhouse using materials that conform to the District (e.g., wooden siding and metal roofing). On January 13, 2025, Vermont DHP concurred with the Town's conclusion that, with the proposed measures, the project would not adversely affect the District.[60]

In its letter filed June 26, 2025, Vermont DHP states that the proposed project has been planned to avoid direct and indirect adverse effects on environment/architectural and archaeological resources, and as such the Vermont SHPO finds that the project does not introduce any direct or indirect adverse effects to any historic properties within the proposed APE, including the District. Vermont DHP recommends that the Town consult with the Vermont SHPO on any project management, maintenance, and operation that could affect historic properties in the proposed APE, including contributing elements of the District, to ensure that the proposed project does not adversely affect historic properties.

Corps special condition 3 requires that the Town construct the project in a manner that would not result in an adverse effect to historic properties. Specifically, the Corps requires that: (1) the windows and doors that were part of the west foundation wall of the mill building be drawn out with trim to show their location historically even though the openings will be closed; (2) repairs to the west wall of the mill building be in-kind and follow guidelines for historic mortar repairs; (3) the concrete for the new sluiceway match the color of the early 20th century concrete on site as closely as possible to ensure that the new concrete blends visually with the existing concrete and does not stand out as new material; (4) concrete repairs follow the guidelines for the preservation of historic concrete; and (5) the new powerhouse match the aesthetic of the mill building to minimize visual impacts on the District.

Our Analysis

Area of Potential Effects

The Town's proposed APE includes the proposed project boundary, land outside of the project boundary that includes contributing resources to the District, and land around the project impoundment extending laterally 33 feet beyond the project boundary, except on the western shoreline of the upper impoundment where the proposed APE only extends to the edge of Moscow Road (Figure B-6).

The APE should include all land needed for project operation and maintenance, including land in the proposed project boundary and the entire water surface area of the impoundment at

[59] *See* National Park Service, Guidelines on Flood Adaptation for Rehabilitating Historic Buildings, 2019; Preservation Brief 2: *Repointing Mortar Joints in Historic Masonry,* 1998; *Preservation Brief 15: Preservation of Historic Concrete,* 2007.

[60] *See* January 22, 2025, Section 106 Consultation Letter.

the proposed normal maximum surface elevation of 636.0 feet, as discussed in section 3.3.5.2, *Land Use*, based on the potential effect of the project on archaeological and architectural resources on land needed for project purposes. The APE should also include all 10 architectural resources that contribute to the District, including the project dam and mill building, and the 8 non-project facilities (Table C-7), as these resources have the potential to be either directly or indirectly affected by project construction and operation. However, the APE should not include the 5 residential buildings that are outside of the project boundary because they do not contribute to the District or otherwise include historic properties.

The Town proposes to include land around the project impoundment extending laterally 33 feet beyond the project boundary, except on the western shoreline of the upper impoundment where the proposed APE only extends to the edge of Moscow Road. The Phase I archaeological site identification survey included subsurface testing along the impoundment shoreline, including where the shoreline is actively eroding. The survey found no archaeological resources on the proposed impoundment shoreline, including where the shoreline is actively eroding. Although project construction has the potential to affect shoreline erosion, as discussed in section 3.3.1.2, Geology and Soils, developing a soil erosion and sediment control plan would ensure that any project-induced erosion is identified and corrected in a timely manner. Because archaeological testing found no archaeological resources on the proposed impoundment shoreline, there is no potential for project effects on historic properties on land around the project impoundment. Therefore, the APE should not include additional land around the project impoundment extending laterally 33 feet beyond the project boundary.

Project Construction and Operation

Hydropower facilities can affect cultural resources as a result of modifications to project facilities or project operation; project-related ground-disturbing activities; construction, modification, or maintenance of project recreation facilities and use of such facilities by visitors; project-induced shoreline erosion;[61] and vandalism. Adverse effects could also include introduction of visual, atmospheric, or audible elements that diminish the integrity of the district's significant historic features or changes to the setting or feel of the historic property.

The Town's ARA did not identify historic archaeological sensitivity at the project based on the extent of past surface grading that occurred for the construction of the Town's maintenance garage, office, and parking area in 2018-2019, as well as disturbance from past construction at the property. The Phase I archaeological site identification survey found no archaeological resources on the proposed impoundment shoreline, including where the shoreline is actively eroding. As discussed in section 3.3.1.2, *Geology and Soils, Environmental Effects*, developing a soil erosion and sediment control plan would ensure that any project-induced shoreline erosion is identified and corrected in a timely manner. Based on the extent of past ground disturbance relative to the footprint of the proposed ground-disturbing activities, a lack of identified archaeological resources, and the development of a soil erosion and sediment control plan, staff conclude that the project is unlikely to adversely impact archaeological resources.

[61] *See supra* at note 28.

Project construction would affect historic architectural resources. The Town proposes to modify the project's historic dam, mill building, and associated hydropower infrastructure. Structural and visual changes would result from modifications to the Smith's Falls dam, the intake structure, and the sluiceway; the addition of a powerhouse northwest of the mill building; rebuilding of the west wall of the mill building; removal of the non-historic shed addition on the north elevation of the mill; and regrading and work at the west side of the mill building.

The Town's proposed measures for designing the project will minimize the project's effects on the District. Repairs to the mill building and Smith's Falls Dam would use materials and/or design elements that conform to the District so to convey the same visual appearance of the time period of significance. As designed, the work would preserve the functional features that contribute to the overall historic character of these structures and mitigate any adverse effects. The powerhouse design would use materials that confirm to those in the District (e.g., clapboard siding and metal roofing). The temporary access and staging areas would not have a lasting visual impact on the historic property because the Town proposes to restore these areas to pre-project conditions. The proposed recreation facilities would have minimal physical and visual impact on the historic setting of the District. Installing a portable toilet, as discussed in section 3.3.5.2, *Recreation*, would be a non-permanent amenity that is reversable;[62] therefore, the portable toilet would not result in an adverse visual effect to the District (NPS, 1993). Restoring the dam and impoundment elevation to their historic height would contribute to the historic character of the district. The proposed rubber crest gate at the dam could diminish the historic character of the district, but the Town's proposal to maintain a 15-cfs minimum bypassed reach flow over the crest gate would result in 2.4 inches of spill over the spillway at all times, which would provide a visual barrier and minimize any visual effect to the District.[63]

The Town office building, maintenance garage, and residences at 81 and 67 Smith's Falls Lane are less than 50 years old and do not meet the age requirement for listing in the National Register. The Second Office building at 431 Moscow Road, no longer contributes to the District due to loss of integrity.[64] However, each of these resources occur within the District and any modifications to these buildings could impact the District's overall character and integrity. The Town is not proposing to modify any of these buildings as part of the Proposed Action.

[62] A reversable feature, such as a temporary portable toilet, can be removed such that the essential form and integrity of the historic property would be unimpaired (NPS, 1993).

[63] The project as proposed by the Town meets the requirements of the Corps' special condition 3 that requires the Town to construct the project in a manner that will mitigate adverse effects to District.

[64] A property within a historic district might be deemed non-contributing due to factors such as: (1) significant deterioration of the property; (2) the property post-dates the period of significance for the district; and (3) alteration that removes significant characteristics (e.g., original form, materials, or features).

Staff conclude that the Town's proposed design for the project would maintain the historic character of District, would not impact any of the characteristics that qualify it for the National Register, and would not result in an adverse effect to the historic property.

Although no archaeological resources are known to occur in the APE, it is possible that unknown historic properties may be discovered during project construction, operation or other project-related activities that require ground disturbance.

Developing and implementing an HPMP in consultation with Vermont DHP and Tribes, as proposed by the Town, would ensure that measures are in place to protect historic properties in the APE from adverse effects related to the construction, operation, and maintenance of the project.[65] An HPMP would also ensure that any previously undiscovered archaeological resources within the APE are not adversely affected by the project. The HPMP should include the Town's proposed measures for designing the project in a manner that eliminates adverse effects the District. The HPMP should also include provisions for consulting with the Vermont SHPO on any project operation and maintenance that could affect historic properties in the APE, including contributing elements of the District, to ensure that the proposed project does not adversely affect historic properties.

To meet the requirements of section 106 of the NHPA, the Commission intends to execute a Programmatic Agreement with the Vermont SHPO and federally recognized Tribes for the proposed project to protect historic properties. The terms of the Programmatic Agreement would require the Town to develop and implement an HPMP for the project to ensure that the proposed project does not adversely affect historic properties in the APE.

3.4 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, the project would not be issued an exemption from licensing, the project would not be constructed or generate electricity, and there would be no effects on environmental resources.

4.0 RECOMMENDED ALTERNATIVE

Based on our independent review of public comments filed on this project and our evaluation of the environmental effects of the Proposed Action and its alternatives, we selected the Staff Alternative as the preferred alternative for the project. We recommend this alternative because: (1) issuing an exemption from licensing for the project would allow the Town to construct and operate its project as a beneficial and dependable source of electrical energy; (2) the 150 kW of electric capacity would come from a renewable resource that does not contribute to atmospheric pollution; and (3) the recommended measures would protect geology and soils, aquatic, fisheries, terrestrial, recreational, and cultural resources.

[65] *See* the Commission's Guidelines for the Development of Historic Properties Management Plans for FERC Hydroelectric Projects (May 20, 2002), located at https://www.ferc.gov/sites/default/files/2020-07/hpmp.pdf.

In the following section, we make recommendations as to which environmental measures proposed by the Town should be included in any exemption from licensing issued for the project. In addition to the Town's proposed environmental measures listed below, we recommend additional staff-recommended environmental measures or modifications to be included in any exemption issued for the project.

Under the Staff Alternative, the project and project boundary would include the entire water surface area of the impoundment at the proposed normal maximum surface elevation of 636.0 feet, instead of a 1.75-acre impoundment proposed by the Town. The project boundary would also exclude 0.06 acre of land associated with an apartment building that the Town proposes to include in the project boundary.

4.1.1 Measures Proposed by the Town

We recommend the following operation and environmental measures proposed by the Town for any exemption that would be issued for the project:

- To protect aquatic resources, operate the project in a run-of-river mode by maintaining a normal maximum impoundment surface elevation of 636.0 feet.

- To protect aquatic and aesthetic resources, release a minimum flow of 15 cfs or inflow, whichever is less, from the spillway to the bypassed reach.

- To protect fish from turbine entrainment, install a trashrack with 1-inch clear bar spacing.

- To prevent erosion and reduce the effects of project construction on upland and riparian habitats, implement the following measures: (1) place geotextile fabric and timber matting over soils during construction; (2) install rip rap along the shoreline, where applicable; and (3) revegetate disturbed areas with native vegetation following construction.

- To reduce project-induced sedimentation during construction, implement the Flow Management Plan filed in section 2.9 of the application on February 18, 2025, including procedures for minimizing the suspension of sediments and disposing of excavated sediments at an offsite location.

- To protect aquatic resources during impoundment drawdowns and refills for construction and planned maintenance, implement the Flow Management Plan filed in section 2.9 of the application on February 18, 2025, that includes provisions to: (1) following construction, increase the impoundment surface elevation by no more than 1 foot per day and maintain a minimum downstream flow of 15 cfs or, if inflow is less than 15 cfs, retain no more than 10% of inflow; and (2) for planned maintenance: (a) during impoundment drawdowns, lower the impoundment surface elevation by no more than 1 foot per day or 0.5 inch per hour; and (b) during impoundment refills, increase the impoundment surface elevation by no more than 1 foot per day or 0.5 inch per hour, and maintain a minimum flow of 15 cfs to the bypassed reach.

- To reduce the spread of invasives during project construction, implement the Invasive Species Plan filed as Appendix L of the application on February 18, 2025, including the following measures: (1) identify and use staging areas that are free of invasive species; (2) move from areas with no invasive species to areas with invasive species, when possible; (3) clean all equipment prior to moving from areas with invasive species to areas without invasive species; (4) limit removal of excavated material from sites with invasive species; (5) destroy or dispose of invasive species from any excavated material; and (6) cover soils containing invasive species during transport.

- To control invasive species associated with recreation use at the project, implement the Conceptual Recreation Plan filed as Appendix I of the application on November 25, 2024, including manual, mechanical, and herbicide control methods throughout the operation of the project.

- To protect the federally listed endangered NLEB, avoid the removal of trees that are equal to or greater than 3 inches dbh between April 1 and November 1.

- To provide recreation opportunities, maintain the project recreation facilities proposed in the Conceptual Recreation Plan.

- To reduce the effects of construction on aesthetic resources: (1) limit all non-emergency outdoor lighting between the hours of 6:00 p.m. and 7:00 a.m. to only motion-activated lighting; (2) restrict all construction to the hours of 7:00 a.m. to 7:00 p.m. Monday through Friday, and 8:00 a.m. to 5:00 p.m. on Saturdays; and (3) prohibit construction on Sundays and state and federal holidays.

- To protect historic properties that are eligible for listing or listed on the National Register, develop an HPMP.

4.1.2 Additional Measures Recommended by Staff

Under the Staff Alternative, the project would be operated with the Town's proposed measures, as identified above, and the following staff-recommended measures.

- To minimize project-induced erosion and sedimentation, develop a soil erosion and sediment control plan that includes: (1) a detailed description of the site conditions (i.e., soil type, vegetative cover, and topography) where construction/soil disturbance would occur; (2) site-specific measures and BMPs to control erosion, prevent slope instability, and minimize the quantity of sediment resulting from project construction and operation (i.e., geotextile fabric, timber matting, riprap, and silt fences), as generally proposed by the Town; (3) sedimentation provisions consistent with the Town's proposed Flow Management Plan; (4) a map showing the locations of all proposed erosion and sediment control measures; (5) a description of temporary soil storage measures and identification of all off-site soil disposal location(s); (6) procedures and schedule for monitoring the effectiveness of site-specific mitigation measures; (7) provisions for shoreline erosion monitoring and mitigation, including: (a) a description of methods for documenting impoundment shoreline erosion prior to

construction and within 2 years after the project commences operation, to determine the extent and magnitude of any project-induced erosion (i.e., erosion occurring in new areas resulting from increasing the impoundment surface elevation from 634.4 feet to 636.0 feet); (b) consultation with FWS and Vermont ANR on repairs at any sites of project-induced erosion and measures to prevent further project-induced erosion (e.g., placing riprap or installing a gabion wall on project land at the erosion site); and (c) a report to be filed with the Commission by March 1 of the year following the second erosion survey, including: (i) the results of the two erosion surveys, including descriptions of the erosion (elevation, length, severity) and maps depicting the extent of erosion along the shoreline; (ii) conclusions regarding the cause of any new erosion following project construction, including whether increasing the impoundment elevation resulted in any new erosion; (iii) any proposed measures for repairing project-induced erosion and preventing further project-induced erosion; and (iv) documentation of consultation with the agencies; and (8) an implementation schedule.

- To protect aquatic and terrestrial resources during impoundment drawdowns and refills related to maintenance and emergencies, implement the following drawdown and refill procedures: (1) for planned drawdowns, lower impoundment levels at a rate not exceeding 1 foot per day or 0.5 inch per hour, as proposed by the Town; and (2) after planned and unplanned drawdowns, implement the following impoundment refill procedure: (a) if inflow is 15 cfs or greater, increase impoundment levels by no more than 1 foot per day or 0.5 inch per hour, and release a minimum flow of 15 cfs to the bypassed reach, as proposed by the Town; or (b) if inflow is less than 15 cfs, release 90% of inflow downstream to the bypassed reach and use 10% of inflow to refill the impoundment.

- To reduce the effects of project construction on freshwater mussels, develop a pre-construction mussel survey and relocation plan in consultation with FWS and Vermont ANR, including the following provisions: (1) survey the impoundment for freshwater mussels prior to the impoundment drawdown for construction; and (2) if mussels would be stranded during the impoundment drawdown, then develop procedures for relocating mussels to areas that would remain wetted during the drawdown.

- Develop an operation compliance monitoring plan that includes: (1) a detailed description of how the Town will maintain, monitor, and document compliance with the operational requirements of any exemption from licensing; (2) a description of the gages, sensors, and other measuring devices used to monitor compliance with the requirements of any exemption from licensing; (3) a schedule for installing any monitoring equipment needed to document compliance with the operational requirements of any exemption from licensing; (4) procedures for maintaining and calibrating monitoring equipment; (5) standard operating procedures to be implemented outside of normal operating conditions, including procedures for deflating the rubber crest gate to manage flows during high flow events to minimize flooding upstream of the dam to the extent possible, and procedures for scheduled and

unscheduled facility shutdowns; and (6) notifying the Commission of planned and unplanned deviations from the requirements of any exemption from licensing.

- To protect wildlife habitat following project construction, develop a construction vegetation management plan that includes the following provisions: (1) revegetating project construction areas and restoring the pre-construction elevations and contours of land within 30 days of completing work in the areas; (2) a description of the project construction areas to be revegetated following construction, including acreages, topography, soil types, and existing vegetation; (3) a description of the measures to be taken to revegetate disturbed areas with native vegetation and seed, as proposed by the Town; (4) a description of the techniques and BMPs to be used to control the establishment, reintroduction, and spread of non-native invasive plants until disturbed areas are successfully revegetated, as proposed by the Town in the Invasive Species Plan; (5) a 2-year post-construction monitoring period that includes criteria for measuring the success of revegetation efforts and invasive species control efforts, and a description of procedures to be followed if monitoring shows that revegetation or invasive species control measures are not successful; (6) a schedule for filing reports on the progress of revegetation with the Commission; and (7) an implementation schedule that provides a timeline for initiating and completing construction-related vegetation management activities within disturbed areas.

- To enhance recreation opportunities at the project, develop a recreation management plan that includes the following provisions: (1) a description of the proposed recreation facilities and signage, including the materials, locations, and dimensions of the recreation facilities and associated amenities; (2) installation of a "Portage Ahead" sign on land owned by the Town in the project boundary (e.g., on the south shoreline of the impoundment, immediately downstream of the Moscow Road Bridge); (3) installation of a portable toilet adjacent to the parking lot; (4) marking the trail within the parking lot; (5) designating three parking spots with signage for vehicles for recreation access; (6) a map showing the location of the recreation facilities proposed in the Conceptual Recreation Plan, and portable toilet and parking spots; (7) a construction, operation, and maintenance schedule for the recreation facilities; (8) a description of maintenance activities and vegetation management at the recreation facilities; and (9) filing a report with the Commission every 10 years to assess the condition and adequacy of the recreation facilities.

We discuss the basis for the staff- recommended measures and the rationale for modifying the Town's proposals below.

Project Facilities and Boundary

The proposed project boundary encloses approximately 3.3 acres, including: (1) a 1.75-acre impoundment; (2) 1.05 acre of land associated with the project facilities described in section 2.1.1*, Project Facilities*; (3) 0.44 acre of land adjacent to the southern shoreline of the impoundment; and (4) 0.06 acre of land associated with an apartment building adjacent to the north shoreline of the impoundment.

According to the Commission's regulations, project boundaries should enclose "only those lands necessary for operation and maintenance of the project and for other project purposes, such as recreation, shoreline control, or protection of environmental resources."[66]

As discussed in section 3.3.5.2, *Land Use*, erosion and sedimentation has significantly changed the river channel in recent years (Figure B-2), including the north bank of the river approximately 700 to 900 feet upstream of the dam. From satellite imagery, it is apparent that the proposed 1.75-acre impoundment does not accurately follow the existing shoreline and that the proposed project boundary does not include the entire surface area of the impoundment at the proposed normal maximum surface elevation of 636.0 feet (Figure 2). Although the license application includes georeferenced shapefiles of the contour elevation of 636.0 feet, the shapefiles appear to be based on outdated topographic data that do not reflect recent sediment deposition in the proposed impoundment or erosion on the impoundment shoreline.

Without updated shapefiles and topographic data that reflect the existing condition of the shoreline, staff cannot accurately quantify the surface area of the impoundment at the normal maximum surface elevation of 636.0 feet. However, the entire impoundment is necessary for project operation and maintenance and should be included in the project boundary. Therefore, we recommend an exemption condition requiring the Town to revise the Exhibit G map and georeferenced shapefiles to enclose the entire water surface area of the impoundment at the proposed normal maximum surface elevation of 636.0 feet in the project boundary.

The following land that the Town proposes to include in the proposed project boundary would be needed for project operation and maintenance: (1) 1.05 acre of land associated with the project facilities described in section 2.1.1*, Project Facilities*; and (2) 0.44 acre of land adjacent to the southern shoreline of the impoundment.

The apartment building located immediately upstream of the dam would not be used for project purposes. Therefore, inclusion of the 0.06 acre of land associated with the apartment building in the proposed project boundary does not appear to be warranted.

In summary, we recommend an exemption condition requiring the proposed project boundary to be modified to include the entire water surface area of the impoundment at the proposed normal maximum surface elevation of 636.0 feet and exclude 0.06 acre of land associated with the apartment building.

Soil Erosion and Sediment Control Plan

The Town proposes to construct the project facilities described in section 2.2.1, *Project Facilities*. The Town proposes to draw down the impoundment from a water surface elevation of 634.4 feet to 627.0 feet to provide access to the dam for modification for approximately 6 months during construction. Following construction, the Town would refill the impoundment to a water surface elevation of 636.0 feet.

To reduce project-induced sedimentation during construction, the Town proposes to implement the Flow Management Plan that includes procedures for installing and removing

[66] 18 C.F.R. § 4.41(h)(2) (2024).

cofferdams, managing flows and sediment, and disposing of excavated sediments at an offsite location. To prevent erosion and reduce the effects of project construction on upland and riparian habitat, the Town proposes to implement the following measures: (1) place geotextile fabric and timber matting over soils during construction; (2) install rip rap along the shoreline, where applicable, following construction; and (3) revegetate disturbed areas with native vegetation following construction.

As discussed in section 3.3.1.2, *Geology and Soils, Project Construction*, the Town's proposed Flow Management Plan includes construction procedures to manage discharges and reduce sediment mobilization during and after construction. However, the Town states that the Flow Management Plan is a suggested sequence of events that could change prior to and during construction. Additionally, some of the proposed construction activities are not fully described (i.e., tailrace construction, shoreline protection, and sediment storage and disposal), or remain in the conceptual phase (e.g., fishing and boating access trail), and are subject to change as designs are finalized. Developing a soil erosion and sediment control plan that is based on final project design plans and that identifies site-specific measures for erosion and sedimentation, would minimize project effects on erosion and sedimentation.

As discussed in section 3.3.1.2, *Geology and Soils, Impoundment Shoreline Erosion*, the existing impoundment shoreline includes actively eroding areas. Increasing the normal surface elevation of the impoundment from 634.4 to 636.0 feet, as proposed, would inundate land on the shoreline that is not currently inundated. Altering the location of the water-soil interface on the eastern shoreline of the impoundment has the potential to shift erosion to the new area that would be inundated following construction. Surveying the impoundment shoreline for erosion following project construction would ensure that the Town can identify whether the erosion worsens after the impoundment elevation is restored to the historic elevation and, if so, whether any new erosion is project-induced and should be mitigated.[67] Developing a soil erosion and sediment control plan that includes measures for shoreline erosion monitoring and mitigation would ensure that any new erosion caused by restoring the impoundment surface elevation to historic levels is identified in a timely manner.

To minimize project-induced erosion and sedimentation, we recommend an exemption condition that requires the Town to develop a soil erosion and sediment control plan, in consultation with FWS and Vermont ANR, that includes: (1) a detailed description of the site conditions (i.e., soil type, vegetative cover, and topography) where construction/soil disturbance would occur; (2) site-specific measures and BMPs to control erosion, prevent slope instability, and minimize the quantity of sediment resulting from project construction and operation (i.e., geotextile fabric, timber matting, riprap, and silt fences), as generally proposed by the Town; (3) sedimentation provisions consistent with the Town's proposed Flow Management Plan; (4) a map showing the locations of all proposed erosion and sediment control measures; (5) a description of temporary soil storage measures and identification of all off-site soil disposal location(s); (6) procedures and schedule for monitoring the effectiveness of site-specific

[67] Project-induced shoreline erosion does not include shoreline erosion attributable to flood flows or natural phenomena, such as wind-driven wave action, erodible soils, and loss of vegetation due to natural causes.

mitigation measures; (7) provisions for shoreline erosion monitoring and mitigation, including: (a) a description of methods for documenting impoundment shoreline erosion prior to construction and within 2 years after the project commences operation, to determine the extent and magnitude of any project-induced erosion (i.e., erosion occurring in new areas resulting from increasing the impoundment surface elevation from 634.4 feet to 636.0 feet); (b) consultation with FWS and Vermont ANR on repairs at any sites of project-induced erosion and measures to prevent further project-induced erosion (e.g., placing riprap or installing a gabion wall on project land at the erosion site); and (c) a report to be filed with the Commission by March 1 of the year following the second erosion survey, including: (i) the results of the two erosion surveys, including descriptions of the erosion (elevation, length, severity) and maps depicting the extent of erosion along the shoreline; (ii) conclusions regarding the cause of any new erosion following project construction, including whether increasing the impoundment elevation resulted in any new erosion; (iii) any proposed measures for repairing project-induced erosion and preventing further project-induced erosion; and (iv) documentation of consultation with the agencies; and (8) an implementation schedule.

Impoundment Refill Procedures

The Town is not proposing any specific impoundment drawdowns after the project is operational, but drawdowns could periodically occur for maintenance and/or emergencies associated with project facilities. To protect aquatic resources during impoundment refills following impoundment drawdowns for planned maintenance, the Town proposes to increase the impoundment surface elevation by no more than 1 foot per day or 0.5 inch per hour and maintain a minimum flow of 15 cfs through the low-level outlet gate to the bypassed reach.

The Town's proposal to maintain a minimum flow of 15 cfs during impoundment refills could lower the impoundment surface elevation when inflow to the project is less than 15 cfs. This would result in a drawdown instead of a refill and would dewater aquatic habitat, as outflow from the project would exceed inflow. Additionally, the Town has not proposed a refill procedure following unplanned drawdowns associated with emergencies. To protect aquatic resources during impoundment refills associated with planned maintenance and emergencies, staff recommends an exemption condition that requires implementation of the following refill procedure after planned and unplanned drawdowns: (1) if inflow is 15 cfs or greater, increase impoundment levels by no more than 1 foot per day or 0.5 inch per hour, and release a minimum flow of 15 cfs to the bypassed reach, as proposed by the Town; or (2) if inflow is less than 15 cfs, release 90% of inflow downstream to the bypassed reach and use 10% of inflow to refill the impoundment.

Pre-Construction Mussel Survey and Relocation Plan

The Town proposes to draw down the impoundment from a water surface elevation of 634.4 to 627.0 feet to provide access to the dam for modification for approximately 6 months during construction. The Town does not propose any specific drawdown limits while lowering the impoundment for project construction but indicates that the drawdown will be conducted "slowly" to minimize the potential for sedimentation.

As discussed in section 3.3.2.2, *Aquatic Resources, Impoundment Drawdowns and Refills*, the procedures that are used to draw down an impoundment can significantly affect

aquatic habitat and organisms in the impoundment. Freshwater mussels, given their limited mobility, are particularly vulnerable to drawdowns as they may not be able to relocate to wetted habitat or burrow quickly enough to avoid desiccation as water levels recede. As discussed in section 3.3.2,1 *Aquatic Resources, Aquatic Organisms*, no mussel surveys have been conducted in the project area. However, the majority of mussel species in Vermont are found within the Lake Champlin drainage, which includes the project area, and the state listed endangered eastern pearlshell is known to occur downstream in the Winooski River.

Given the extent (approximately 6.5 feet) and duration (approximately 6 months) of the proposed impoundment drawdown for construction, only mussels in or near the thalweg of the river channel would be expected to survive impoundment dewatering, regardless of the drawdown rate. To reduce the effects of project construction on freshwater mussels, staff recommends an exemption condition requiring the development of a pre-construction mussel survey and relocation plan in consultation with FWS and Vermont ANR that includes, at a minimum, the following provisions: (1) survey the impoundment for freshwater mussels prior to the impoundment drawdown for construction; and (2) if mussels would be stranded during the impoundment drawdown, then develop procedures for relocating mussels to areas that would remain wetted during the drawdown.

Operation Compliance Monitoring Plan

As discussed in section 3.3.2.2, *Aquatic Resources, Operation Compliance Monitoring*, developing an operation compliance monitoring plan would help the Town document compliance with the operational provisions of any exemption from licensing and provide a mechanism for reporting deviations. An operation compliance monitoring plan would also help the Commission verify that the project is operating in a run-of-river mode, maintaining impoundment elevations, and releasing the required minimum flows, thereby facilitating administration of the exemption from licensing and assisting with the protection of resources that are sensitive to deviations from normal operating conditions.

We recommend an exemption condition requiring the Town to develop an operation compliance monitoring plan that includes: (1) a detailed description of how the Town will maintain, monitor, and document compliance with the operational requirements of any exemption from licensing; (2) a description of the gages, sensors, and other measuring devices used to monitor compliance with the requirements of any exemption from licensing; (3) a schedule for installing any monitoring equipment needed to document compliance with the operational requirements of any exemption from licensing; (4) procedures for maintaining and calibrating monitoring equipment; (5) standard operating procedures to be implemented outside of normal operating conditions, including procedures for deflating the rubber crest gate to manage flows during high flow events to minimize flooding upstream of the dam to the extent possible, and procedures for scheduled and unscheduled facility shutdowns; and (6) notifying the Commission of planned and unplanned deviations from the requirements of any exemption from licensing.

Construction Vegetation Management Plan

To reduce the spread of invasives during project construction, the Town proposes to implement the Invasive Species Plan filed as Appendix L of the application on February 18,

2025, including the following measures: (1) identify and use staging areas that are free of invasive species; (2) move from areas with no invasive species to areas with invasive species, when possible; (3) clean all equipment prior to moving from areas with invasive species to areas without invasive species; (4) limit removal of excavated material from sites with invasive species; (5) destroy or dispose of invasive species from any excavated material; and (6) cover soils containing invasive species during transport.

As discussed in section 3.3.3, *Terrestrial Resources,* the Town's proposed measures would reduce the potential for project construction to spread invasive species. However, some of the proposed construction activities are not fully described (i.e., tailrace construction and shoreline protection), or remain in the conceptual phase (e.g., fishing and boating access trail) and are subject to change as designs are finalized. Development of a construction vegetation management plan would ensure that wildlife habitats are restored at disturbed sites in a timely manner.

We recommend an exemption condition requiring the Town to develop a construction vegetation management plan, in consultation with FWS and Vermont ANR, that includes: (1) revegetating project construction areas and restoring the pre-construction elevations and contours of land within 30 days of completing work in the areas; (2) a description of the project construction areas to be revegetated following construction, including acreages, topography, soil types, and existing vegetation; (3) a description of the measures to be taken to revegetate disturbed areas with native vegetation and seed, as proposed by the Town; (4) a description of the techniques and BMPs to be used to control the establishment, reintroduction, and spread of non-native invasive plants until disturbed areas are successfully revegetated, as proposed by the Town in the Invasive Species Plan; (5) a 2-year post-construction monitoring period that includes criteria for measuring the success of revegetation efforts and invasive species control efforts, and a description of procedures to be followed if monitoring shows that revegetation or invasive species control measures are not successful; (6) a schedule for filing reports on the progress of revegetation with the Commission; and (7) an implementation schedule that provides a timeline for initiating and completing construction-related vegetation management activities within disturbed areas.

Recreation Management Plan

The Town filed a Conceptual Recreation Plan on November 25, 2024, that includes the following recreation facilities: (1) a 1,000-square-foot hand-carry boat access site on the north shoreline of the impoundment approximately 185 feet upstream of the dam; (2) a 485-foot-long fishing and boating access trail around the north side of the dam; and (3) a 1,500-square-foot hand-carry boat and fishing access site on the north riverbank approximately 70 feet downstream of the tailrace. The Town proposes to install five directional signs for the access trail.

As discussed in section 3.3.5.2, *Recreation,* the Town's proposed fishing and boating access trail and access sites would benefit the public by providing recreation access to the Little River where no access currently exists. Additionally, the Town's proposed directional signage would help ensure that recreation users are able to identify access points and follow the trail. However, the Conceptual Recreation Plan should be finalized prior to construction. It currently includes multiple options for portage signs (single posts, informational maps), trail markings (painted, stone), and staircases (metal, wood, rock). The materials, dimensions, and locations of

the staircases, signage, and trail markings should be specified in the final recreation plan. The Conceptual Recreation Plan also shows that a "Portage Ahead" sign would be installed on the shoreline of the impoundment upstream of Moscow Road Bridge. Based on the Exhibit G map filed on November 25, 2024, this sign would be located on private property outside of the project boundary. The sign could be installed on property owned by the Town and in the proposed project boundary, immediately downstream of Moscow Bridge. Also, the Town proposes to route the trail through an existing parking lot that is used to access office and apartment buildings. To ensure public safety, the trail should be clearly marked so no vehicles are parked or operating on the trail where recreation users could be carrying boats. In addition, to ensure vehicular access for recreation users, the Town could designate at least three parking spots for vehicles for recreation access and mark the spots with signs. Finally, with increased public use associated with the proposed project recreation facilities, installing a portable toilet adjacent to the parking lot would help maintain aesthetic and sanitary conditions at the project.

To enhance recreation opportunities at the project, we recommend an exemption condition requiring the Town to develop a recreation management plan that at a minimum, includes the following provisions: (1) a description of the proposed recreation facilities and signage, including the materials, locations, and dimensions of the recreation facilities and associated amenities; (2) installation of a "Portage Ahead" sign on land owned by the Town in the project boundary (e.g., on the south shoreline of the impoundment, immediately downstream of the Moscow Road Bridge); (3) installation of a portable toilet adjacent to the parking lot; (4) marking the trail within the parking lot; (5) designating three parking spots with signage for vehicles for recreation access; (6) a map showing the location of the recreation facilities proposed in the Conceptual Recreation Plan, and portable toilet and parking spots; (7) a construction, operation, and maintenance schedule for the recreation facilities; (8) a description of maintenance activities and vegetation management at the recreation facilities; and (9) filing a report with the Commission every 10 years to assess the condition and adequacy of the recreation facilities.

4.1.3 Unavoidable Adverse Effects

A short-term increase in traffic, noise, and visual disturbance would occur during construction of the proposed project. Such activities would be minimized by implementation of control measures consistent with the standard terms and conditions of any exemption from licensing issued for the project. Even with trash racks installed, some entrainment of small fish could occur during project operation; however, we do not expect any significant effects to resident fish populations from any entrainment associated with project operation. A small amount of upland, riparian, and wetland habitat (approximately 0.14 acre total) would be permanently removed as a result of project construction. However, given the size of these areas, the effects of their removal on the species that inhabit them are expected to be negligible. Lowering the impoundment for approximately 6 months during project construction would affect the aesthetic setting of the project area and reduce aquatic habitat in the impoundment. However, these effects would be temporary and are expected to return to pre-construction conditions following project construction. Modifications to the dam, mill building, and associated hydropower infrastructure would affect historic architectural resources that are listed in the National Register as contributing resources for the Moscow Village Historic District. The Town's proposal to develop and implement an HPMP would ensure that measures are in place to

protect historic properties in the APE from adverse effects related to the construction, operation, and maintenance of project facilities.

5.0 FINDING OF NO SIGNIFICANT IMPACT

If the project is exempted from licensing as proposed with the additional staff-recommended measures, the project would be constructed and operated while protecting geology and soils, aquatic resources, terrestrial resources, federally listed endangered species, recreation resources, and cultural resources.

Based on our independent analysis, issuance of an exemption from licensing for the project as proposed with additional staff-recommended measures, would not constitute a major federal action significantly affecting the quality of the human environment.

6.0 LITERATURE CITED

The literature cited in this EA is presented in Appendix F, *Literature Cited*.

7.0 LIST OF PREPARERS

The list of preparers of this EA is presented in Appendix G, *List of Preparers*.

APPENDIX A

GLOSSARY OF TERMS

Approach velocity: The average water velocity measured a few inches in front of the trashrack on the turbine intake structure.

Archaeological resources: The material remains of past human activity, including, but not limited to: man-made or modified objects; refuse left through human occupation or consumption; and, earthworks and structural ruins associated with past human activity or occupation.

Architectural resources: Extant structures or infrastructure that may retain importance based on physical aspects of design, materials, form, style, or workmanship.

Area of Potential Effects (APE): The geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties (36 C.F.R. § 800.16(d)).

Burst swim speed: The highest speed attainable by a fish which can only be maintained for approximately 20 seconds.

Class B Noxious Weed: Any noxious weed that is not native to the state, is of limited distribution statewide, and poses a serious threat to the State, or any other designated noxious weed being managed to reduce its occurrence and impact in the State, including those on the Federal Noxious Weed List (Vermont Agency of Agriculture, Food, and Markets, 2025).

Contributing Resource: Classification meaning that a property adds to the historic association and/or architectural importance for which a historic property is significant.

Diameter at breast height: Tree diameter as measured about 4 to 4.5 feet above the ground.

Fall-swarming: The time between summer and winter hibernation for bats. The purpose of swarming behavior may include the introduction of juvenile bats to potential hibernacula, copulation, and gathering at stop-over sites on migratory pathways between summer and winter regions.

Hibernaculum: Where a bat hibernates during the winter, such as in a cave.

Historic Properties: Cultural resources that are eligible for listing or listed on the National Register of Historic Places.

Indirect Effects: Audible, visual, and/or atmospheric changes which affect the historic integrity of a historic property.

National Register of Historic Places: A catalog of America's significant districts, sites, buildings, structures, and objects related to architecture, archeology, engineering, and culture.

Palustrine emergent wetlands: Wetlands where emergent plants (i.e., erect, rooted, herbaceous hydrophytes, excluding mosses and lichens) are the tallest life form with at least 30% areal coverage (Federal Geographic Data Committee, 2013).

Palustrine alluvial scrub shrub: Wetlands formed in the floodplain of a river or stream and covered by woody vegetation generally less than 20 feet tall that grow in saturated soil conditions.

Palustrine scrub shrub: Wetlands covered by woody vegetation generally less than 20 feet tall that grow in saturated soil conditions.

Riparian habitat: Area between the upland vegetation community and the riverine environment that is typically dominated by forested floodplains, wetlands, and uplands.

Spring-staging: The time period between winter hibernation and migration to summer habitat for bats. During this time, bats 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).

Tree removal: cutting down, harvesting, destroying, trimming, or manipulating in any other way the trees, saplings, snags, or any other form of woody vegetation likely to be used by tricolored bats.

Undertaking: A project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those carried out by or on behalf of a federal agency; those carried out with federal financial assistance; and those requiring a federal permit, license, or approval." 36 C.F.R. § 800.16 (y) (2024).

White-nose syndrome: A fungal infection that agitates hibernating bats, causing them to rouse prematurely and burn fat supplies. Mortality (in many cases, 90 to 100%) results from starvation or, in some cases, exposure (Frank, Davis, and Herzog, 2019).

APPENDIX B

FIGURES

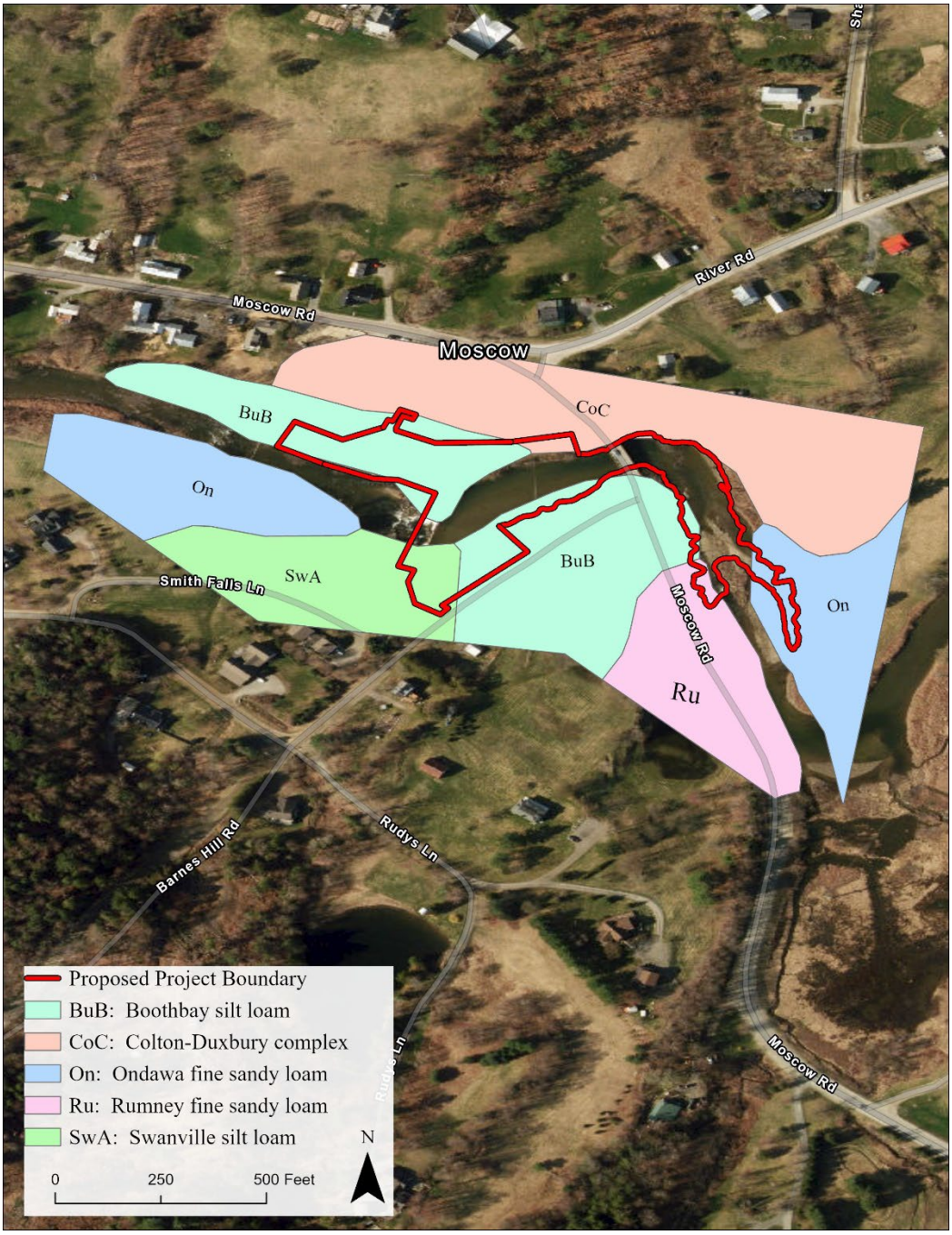

Figure B-1. Soils in the project area (Source: Staff).

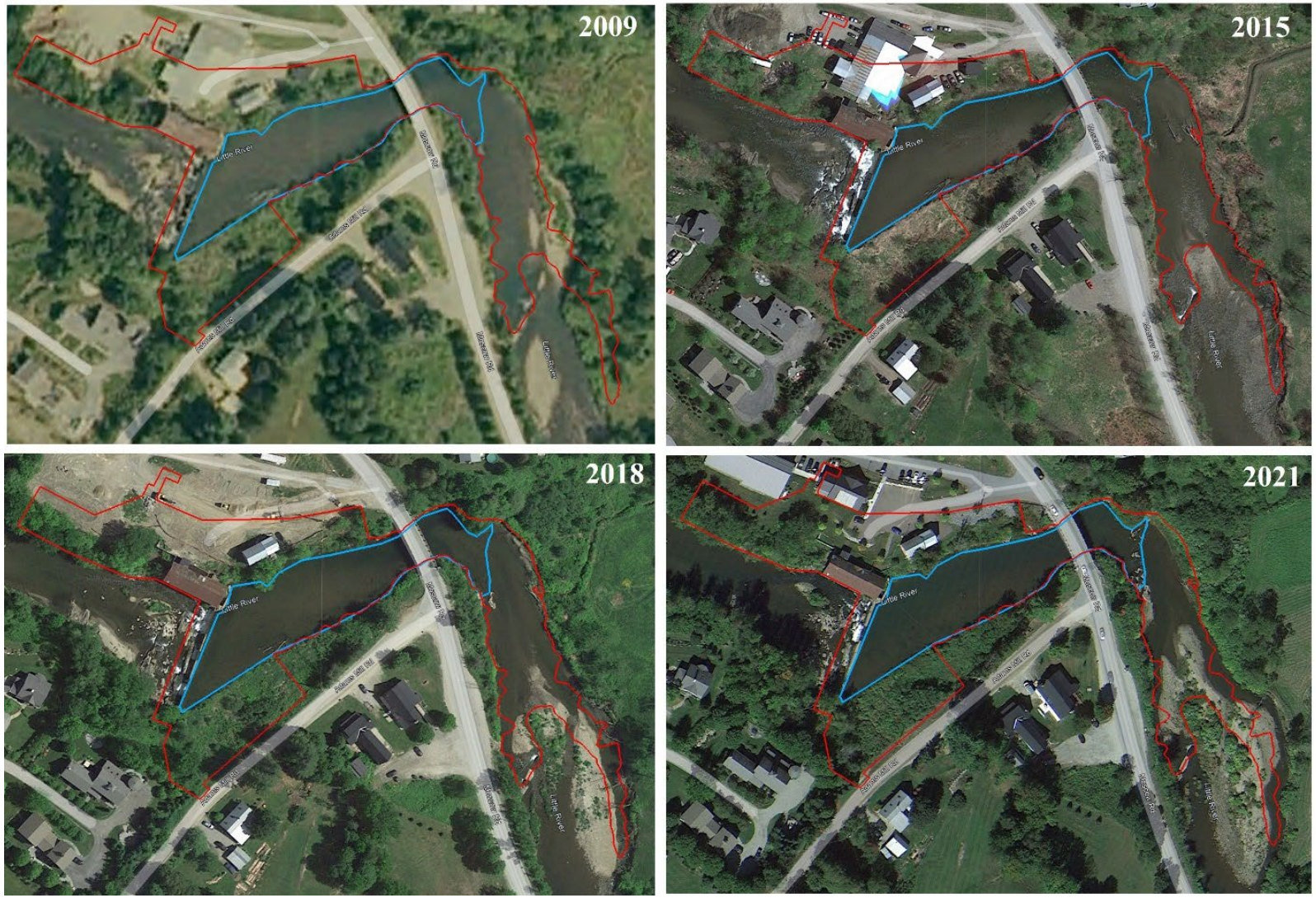

Figure B-2. Timelapse of sediment deposition and erosion occurring upstream of the dam relative to the current extent of the impoundment (blue) and the proposed project boundary (red) (Source: Staff).

Figure B-3. Vermont DEC water quality monitoring locations (Source: Staff).

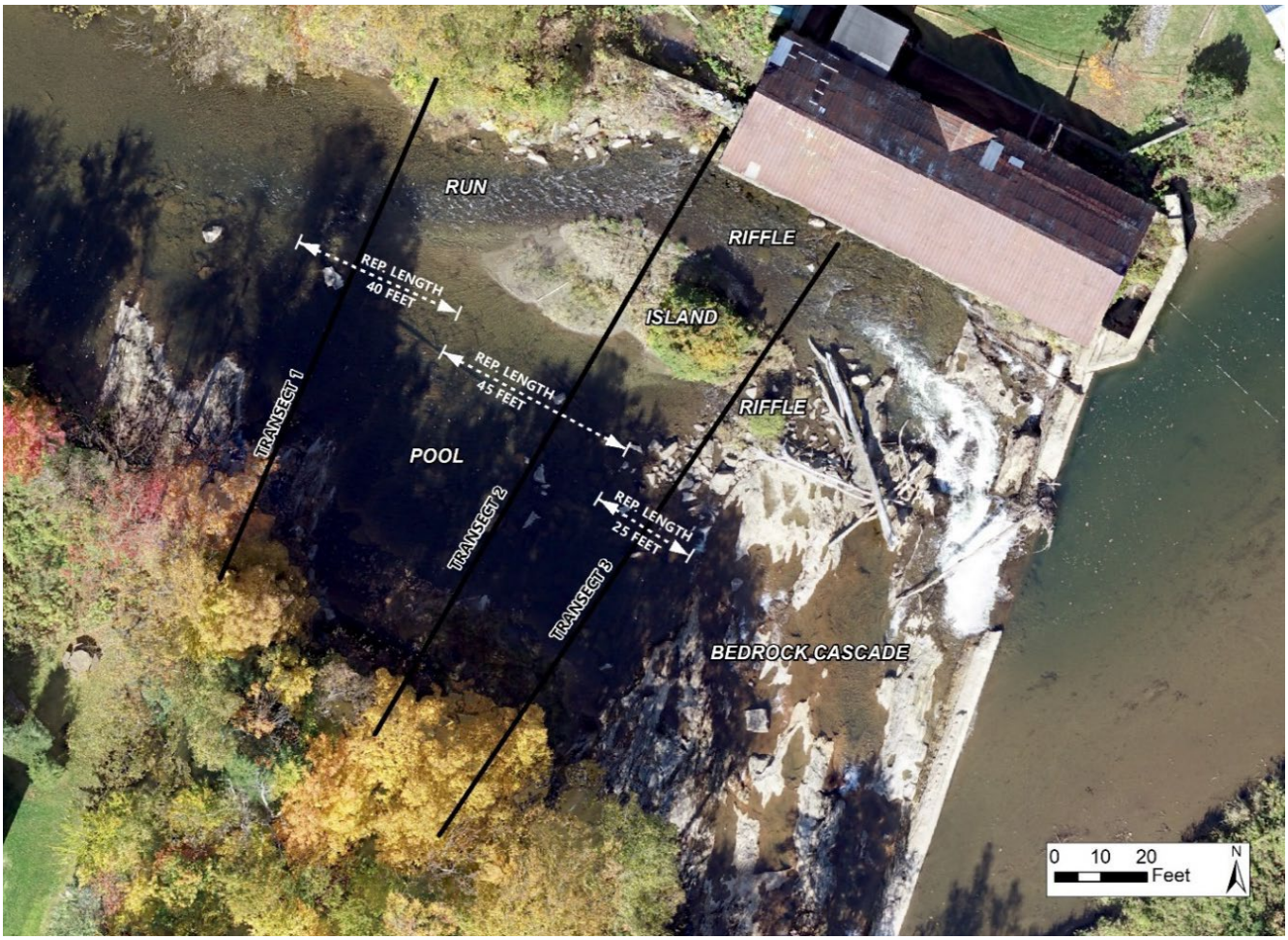

Figure B-4. Bypassed reach habitat mapping (Source: The Town, 2024).

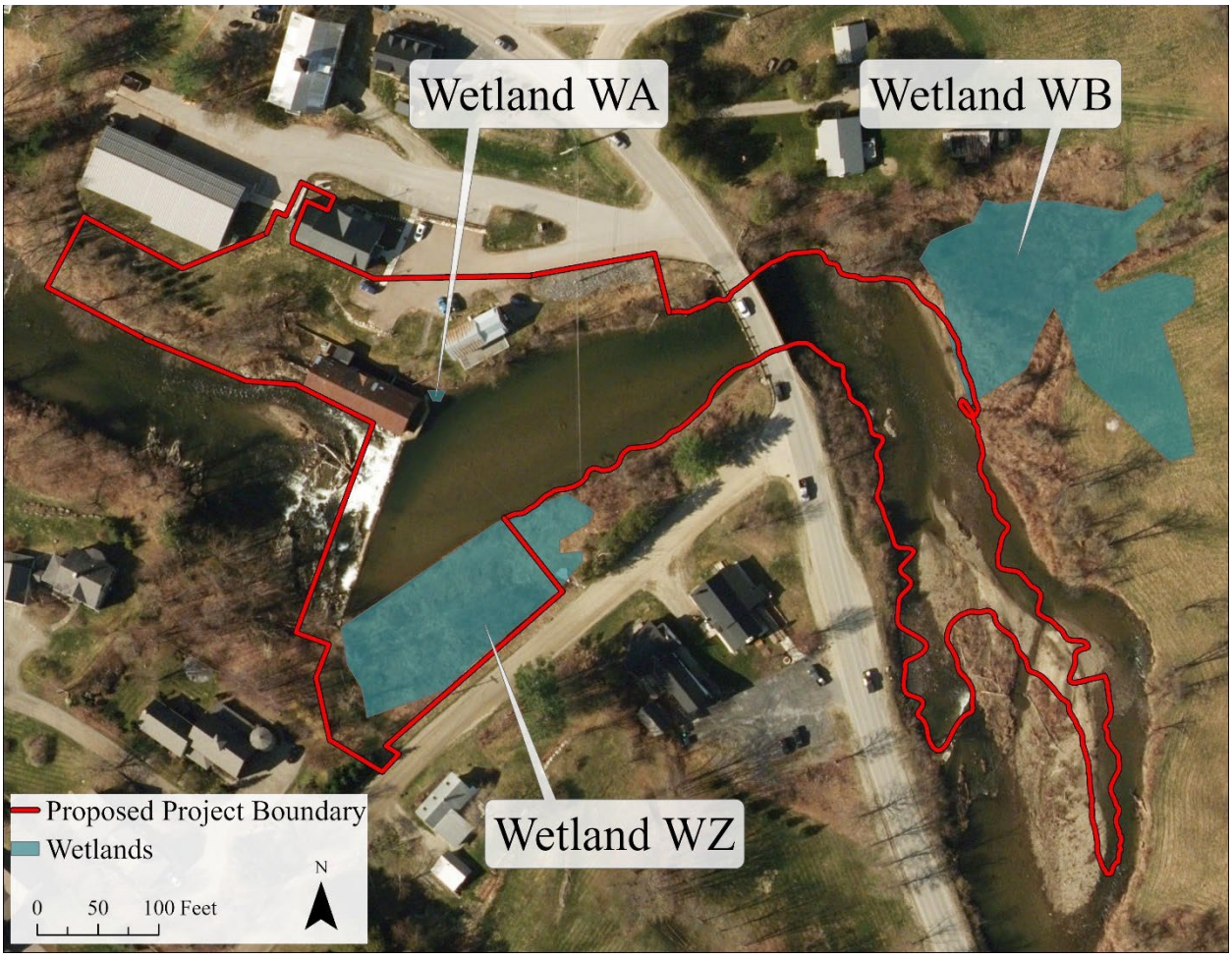

Figure B-5. Delineated wetlands within the Smith's Falls Project area (Source: The Town as modified by staff

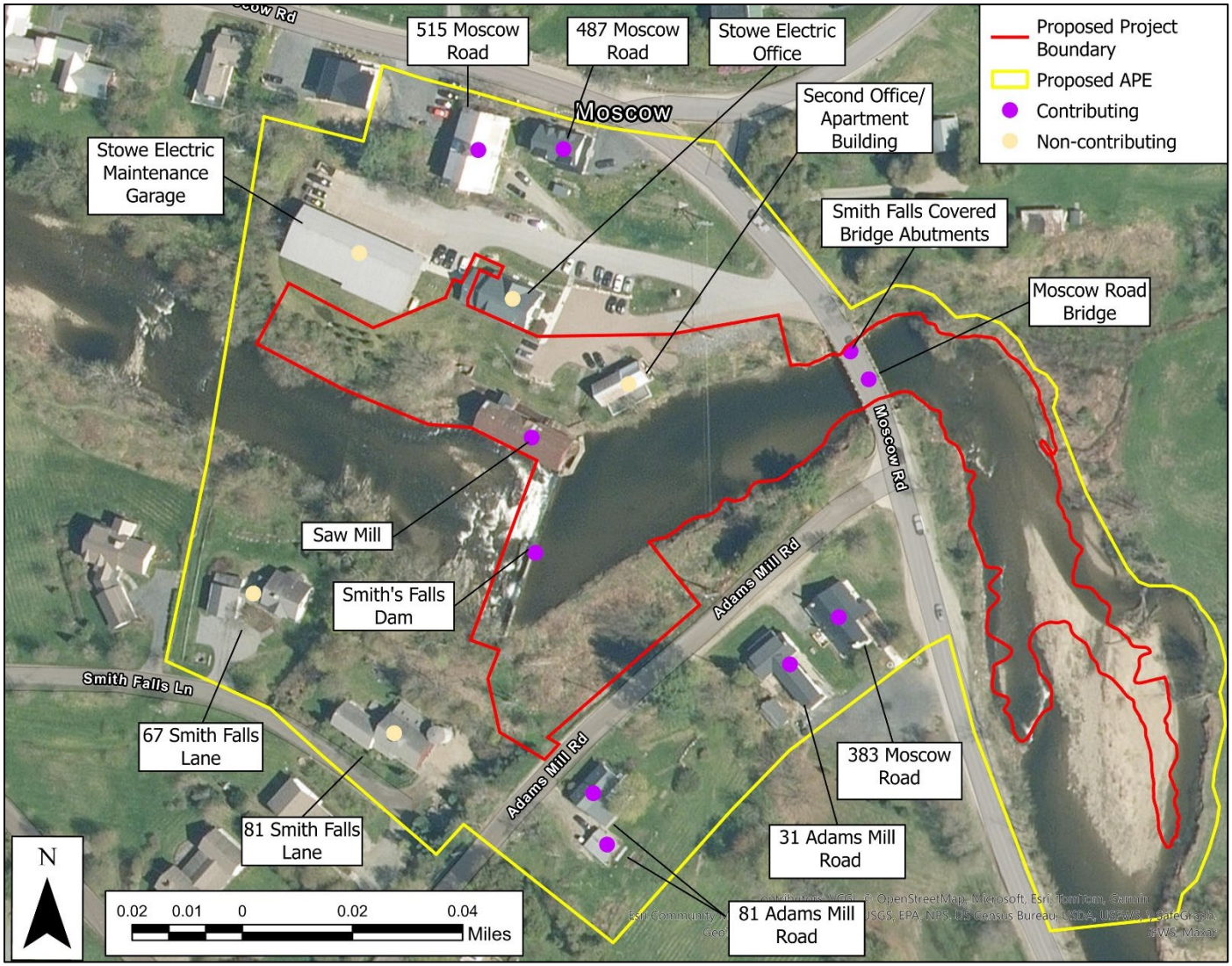

Figure B-6. Proposed APE and contributing and non-contributing resources to the Moscow Village Historic District. (Source: Staff).

APPENDIX C

TABLES

Table C-1. River flows at the Smith's Falls Dam from 2017 through 2024. (Source: Staff).

Month	Minimum Flow (cfs)	90% Exceedance Flow (cfs)	Average Flow (cfs)	10% Exceedance Flow (cfs)	Maximum Flow (cfs)	% Time Inflow> 90cfs
January	40	59	128	197	1,228	59
February	39	49	114	187	1,148	37
March	44	70	190	394	1,356	71
April	122	174	403	792	2,198	100
May	33	64	239	425	1,554	82
June	23	31	123	246	1,733	40
July	16	26	133	238	3,287	39
August	15	20	88	198	1,099	26
September	15	17	67	146	426	21
October	27	35	127	271	1,109	44
November	38	64	153	242	3,277	69
December	49	73	196	358	3,178	72
Annual	**38**	**57**	**164**	**308**	**1,799**	**55**

Table C-2. Water quality monitoring near the proposed project (Source: Staff).

Approximate Distance from Smith's Falls Dam	Date	Benthic Invertebrate Assessment Value	DO (mg/L)	DO % Saturation
1.5 miles downstream	9/30/2008	Excellent-Very good	12.5	122
0.2 mile upstream	9/6/2013	Good	9.44	92
0.6 mile upstream	9/17/1996	Excellent	-	-
0.6 mile upstream	8/2/2004	-	9.23	99.8
2 miles upstream	8/30/2005	Good	8.6	97
2 miles upstream	9/27/2010	Excellent-Very good	8.72	86.1
2 miles upstream	7/29/2015	-	8.91	98.2
2 miles upstream	8/4/2015	-	9.28	103.6
2 miles upstream	8/4/2015	-	9.43	105
2 miles upstream	8/26/2015	-	8.64	93.8
2 miles upstream	8/6/2019	-	8.66	95.1
2 miles upstream	9/23/2015	Good	9.99	96.1

Table C-3. The number of days that the maximum water temperature exceeded 65, 68, 72, 75, or 80°F, the maximum water temperature (Max), and the rolling seven-day mean of maximum daily water temperatures (7DMMD) downstream and upstream of the Smith's Falls Dam (Source: Vermont FWD, 2019; as modified by staff).

Approximate Distance from Smith's Falls Dam	Date	Water Temperature °F						
		65	68	72	75	80	Max	7DMMD
0.36 mile downstream	6/1/2019 to 9/30/2019	86	65	40	8	0	77.4	74.6
3.6 miles upstream		87	68	41	5	0	77.4	75

Table C-4. Length of suitable habitat (feet) for each species/life stage in the proposed bypassed reach (Source: the Town, 2024; as modified by staff).

Species and Life Stage	Modeled 15 cfs Transect						34.4 cfs Transect						48.6 cfs Transect					
	1		2		3		1		2		3		1		2		3	
	Run	Pool	Riffle	Pool	Riffle	Pool	Run	Pool	Riffle	Pool	Riffle	Pool	Run	Pool	Riffle	Pool	Riffle	Pool
Rainbow Trout Juvenile	0.68	15.84	4.79	12.25	13.25	12.94	16.15	16.77	2.15	19.92	16.83	13.25	11.32	14.36	1.99	14.58	12.55	13.30
Rainbow Trout Adult	0.00	12.26	1.34	7.84	13.58	4.55	14.78	9.89	1.82	11.60	13.69	7.69	11.75	9.14	2.40	10.79	11.54	7.88
Longnose Dace Juvenile	0.36	0.03	2.92	0.44	0.94	0.13	0.90	0.00	1.27	0.09	5.04	0.00	1.28	0.12	0.95	0.09	2.31	0.03
Longnose Dace Adult	0.55	0.25	3.53	2.59	2.90	0.99	4.13	0.85	2.97	1.58	7.72	0.52	4.28	1.09	2.73	1.89	6.31	0.98
White Sucker Fry	4.06	38.96	0.27	50.10	12.99	22.23	15.11	42.23	0.00	57.55	1.18	32.60	12.76	44.00	1.36	61.38	10.48	37.66
White Sucker Juvenile & Adult	0.00	18.00	0.01	5.19	9.41	3.85	4.54	5.98	0.00	12.45	1.45	7.23	4.32	9.31	0.62	15.72	1.38	7.10
Smallmouth Bass Fry	0.60	4.81	0.06	16.72	6.59	5.91	11.39	11.85	0.00	18.96	1.55	8.15	8.95	18.49	0.76	20.59	3.20	6.48
Smallmouth Bass Juvenile	0.33	14.88	1.31	4.21	9.16	5.27	7.14	6.62	0.84	9.80	6.43	6.86	4.23	4.96	1.14	5.95	5.76	7.20
Smallmouth Bass Adult	0.07	12.71	0.16	1.20	2.57	1.02	1.46	1.95	0.12	4.26	0.94	3.67	1.19	2.59	0.19	3.22	0.85	3.54
Macroinvertebrates n/a	0.12	0.00	9.81	0.00	0.22	0.00	7.44	0.00	13.19	0.00	6.87	0.00	7.43	0.00	13.44	0.00	17.27	0.24
Total (% Change)	**6.77**	**117.74**	**24.20**	**100.54**	**71.61**	**56.89**	**83.04 (1,126.6)**	**96.14 (-18.3)**	**22.36 (-7.6)**	**136.21 (35.5)**	**61.7 (-13.8)**	**79.97 (40.6)**	**67.51 (-18.7)**	**104.06 (8.2)**	**25.58 (14.4)**	**134.21 (-1.5)**	**71.65 (16.1)**	**84.41 (5.6)**

Table C-5. Fish species likely to occur in the project area (Source: Staff).

Common Name	Scientific Name	Years Collected
Rainbow trout	*Oncorhynchus mykiss*	1976; 2008; 2022
Brown trout	*Salmo trutta*	1976
Brook trout	*Salvelinus fontinalis*	1976
Common shiner	*Luxilus cornutus*	1976; 2022
Blacknose dace	*Rhinichthys atratulus*	1976; 2008; 2022
Longnose dace	*Rhinichthys cataractae*	1976; 2008; 2022
Creek chub	*Semotilus atromaculatus*	1976; 2008
Fallfish	*Semotilus corporalis*	1976; 2008
Longnose sucker	*Catostomus catostomus*	1976
White sucker	*Catostomus commersoni*	1976; 2022
Brown bullhead	*Ameiurus nebulosus*	1976; 2008
Pumpkinseed	*Lepomis gibbosus*	1976; 2008; 2022
Tessellated darter	*Etheostoma olmstedi*	1976; 2008
Yellow perch	*Perca flavescens*	1976
Bluntnose Minnow	*Pimephales notatus*	1976; 2008
Smallmouth Bass	*Micropterus dolomieu*	2008; 2022
Slimy sculpin	*Cottus cognatus*	1976

Table C-6. Burst swim speeds of two size classes of fish (Source: Staff).

Fish Species	Scaling Factor	Length Susceptible to Impingement/ Excluded by 1-in Trashrack (in)	Burst Speed at Length Susceptible to Impingement (fps)[1]	Length (in) at which Burst Speed Exceeds Intake Velocity (1.4 ft/s)
Rainbow Trout	0.1143	>8.75	2.94	2.76
White Sucker	0.146	>6.85	2.94	2.76
Smallmouth Bass	0.1278	>7.82	2.38[2]	3
Pumpkinseed	0.124	>8.06	2.41[2]	3

[1] Burst swimming speeds were estimated using Katopodis and Gervais (2016) fish swim speed and swim time tool.

[2] Burst swimming speeds for smallmouth bass and pumpkinseed are based on general speeds for sunfish and are therefore the same.

Table C-7. Properties located within the APE (Source: Staff).

Property Name	Address	Current Use	Proposed Project Facility (Y/N)	Contributes to Historic District (Y/N)
Alexander Seaver Sawmill	435 Moscow Rd	Industrial Building	Y	Y
Smith Falls Dam	435 Moscow Rd	Industrial Structure	Y	Y
Fred E. Smith Barn	515 Moscow Rd	Commercial Building	N	Y
Alexander and Nancy S. Seaver House	487 Moscow Rd	Residential Building	N	Y
Second Office	431 Moscow Rd	Apartment Building	N	N
Stowe Electric Office Building	431 Moscow Rd	Commercial Building	N	N
Stowe Electric Maintenance Garage	435 Moscow Rd	Commercial Building	N	N
Moscow Road Bridge	Moscow Road	Transportation Structure	N	Y
Smith Falls Covered Bridge Abutments	Moscow Road	Transportation Structure	N	Y
Third Moscow School	383 Moscow Rd	Commercial Building	N	Y

Property Name	Address	Current Use	Proposed Project Facility (Y/N)	Contributes to Historic District (Y/N)
School House Tenement	31 Adams Mill Rd	Residential Building	N	Y
John and Rebecca Moody House	81 Adams Mill Rd	Residential Building	N	Y
Workshop	81 Adams Mill Rd	Residential Outbuilding	N	Y
Residence - 81 Smith Falls Lane	81 Smith Falls Lane	Residential Building	N	N
Residence - 67 Smith Falls Lane	67 Smith Falls Lane	Residential Building	N	N

APPENDIX D

STATUTORY REQUIREMENTS

Federal Power Act

Pursuant to section 30(c) of the Federal Power Act,[68] federal and state fish and wildlife agencies have mandatory conditioning authority on exempted projects. No federal or state fish and wildlife agency filed conditions pursuant to section 30(c).

Clean Water Act

Under section 401(a)(1) of the Clean Water Act (CWA),[69] an applicant must obtain either a water quality certification (certification) from the appropriate certifying authority verifying that any discharge from a project would comply with applicable provisions of the CWA or a waiver of such certification by the appropriate certifying authority. A waiver occurs if the certifying authority does not act on a request for certification within a reasonable period of time, not to exceed one year, after receipt of such request.

On April 25, 2025, the Town applied to the Vermont Department of Environmental Conservation (Vermont DEC) for a section 401 certification for the project. Vermont DEC received the application on the same day.[70] On May 2, 2025, Commission staff issued a notice pursuant to 40 C.F.R. § 121.6 and section 4.34(b)(5) of the Commission's regulations, notifying the Vermont DEC that the reasonable period of time to act on the certification request is 1 year, and if Vermont DEC fails or refuses to act on the request by April 25, 2026, then the agency's certifying authority would be deemed waived pursuant to section 401 of the CWA. Vermont DEC has not yet acted on the certification request.

Endangered Species Act

Section 7 of the Endangered Species Act (ESA)[71] requires federal agencies to ensure their actions are not likely to jeopardize the continued existence of any federally listed endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species. According to the U.S. Fish and Wildlife Service's (FWS) Information for Planning and Consultation (IPaC) system, the federally listed endangered NLEB (*Myotis septentrionalis*) and the proposed threatened monarch butterfly (*Danaus plexippus*) have

[68] 16 U.S.C. § 823a(c).

[69] 33 U.S.C. § 1341(a)(1).

[70] *See* the Town's April 30, 2025, Filing.

[71] 16 U.S.C. § 1536.

the potential to occur at the project.[72] There is no proposed or designated critical habitat for these species in the project area.

Our analyses of project effects on the NLEB and monarch butterfly are presented in Appendix E, *Biological Assessment*. Based on the available information, we conclude that issuing an exemption from licensing for the project would not likely adversely affect the NLEB. We also conclude that issuing an exemption from licensing would not likely jeopardize the continued existence of the monarch butterfly.

Coastal Zone Management Act

Under section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA),[73] the Commission cannot issue a license or permit for a project within or affecting a state's coastal zone unless the state CZMA 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 180 days of its receipt of the applicant's certification.

The State of Vermont does not have a state-designated Coastal Management Zone. Therefore, a coastal zone consistency review is not required.

National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA)[74] 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 in the National Register of Historic Places (National Register).

On August 25, 2022, the Town initiated consultation with the Vermont Division of Historic Preservation (Vermont DHP), which functions as the Vermont State Historic Preservation Office (Vermont SHPO), to identify historic properties, determine the eligibility of cultural resources for listing on the National Register, and assess potential adverse effects on historic properties within the area of potential effect (APE) for the project. The Town initiated consultation with the St. Regis Mohawk Tribe on September 16, 2022. On March 7, 2023, the Tribe contacted the Town via email and waived consultation on the project.[75] Vermont DHP concurred with the Town's proposed APE on March 21, 2023, and January 13, 2025.[76]

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[72] *See* Commission staff's June 10, 2025, Memorandum on Endangered Species Act List.

[73] 16 U.S.C. § 1456(c)(3)(A).

[74] 54 U.S.C. § 306108.

[75] See the Town's July 2, 2024, Application at *Stage 2 Consultation Requirements.*

[76] *See* the Town's November 25, 2024, filing at Appendix E, Attachment 1 and January 22, 2025, filing.

The Town filed its application for an exemption from licensing on July 2, 2024. By letter issued on July 11, 2024, the Commission initiated consultation with the Saint Regis Mohawk Tribe. On July 11 and 12, 2024, Commission staff followed up with the Tribe via email and telephone. The Tribe did not respond to the invitations to consult on the exemption process.[77]

One historic property, the Moscow Village Historic District, occurs in the APE with potential to be adversely affected by the project. Section 3.3.6, *Cultural Resources,* discusses the Town's proposed measures to mitigate adverse effects to the historic property. By letters dated January 13, 2025,[78] and June 26, 2025, the Vermont SHPO concurred with the Town's findings and cultural resource protection measures.

Our analysis of project effects on cultural resources and historic properties is presented in section 3.3.6.2, *Cultural Resources, Environmental Effects*. The project's dam and mill building are contributing resources to the National Register-listed Moscow Village Historic District (District). The Town's proposed APE includes the proposed project boundary, land outside of the project boundary that includes contributing resources to the District, and land around the project impoundment extending laterally 33 feet beyond the project boundary, except on the western shoreline of the upper impoundment where the proposed APE only extends to the edge of Moscow Road. As discussed in section 3.3.6.2, *Area of Potential Effects*, the APE should include all land needed for project operation and maintenance, including land in the proposed project boundary and the entire water surface area of the impoundment at the proposed normal maximum surface elevation of 636.0 feet. The APE should also include all 10 resources that contribute to the District, including the project dam and mill building, and the 8 non-project facilities, as these resources have the potential to be either directly or indirectly affected by project construction and operation. However, the APE should not include land around the project impoundment extending laterally 33 feet beyond the project boundary because archaeological testing found no archaeological resources on the proposed impoundment shoreline. The APE also should not include the 5 residential buildings that are outside of the project boundary because they do not contribute to the District or otherwise include historic properties

We conclude that project construction and operation would adversely affect the District if there are no protective measures in place. To meet the requirements of section 106 of the NHPA, we intend to execute a Programmatic Agreement (PA) with the Vermont SHPO for the protection of historic properties from the effects of proposed project modifications, operation, and maintenance. Federally recognized Tribes and the Town will be invited to concur with the terms of the PA. The terms of the PA would ensure that the Town protects all historic properties identified within the project's APE through the implementation of an historic properties management plan.

[77] *See* Commission staff's September 10, 2024, Memorandum on Tribal Outreach.

[78] *See* the Town's January 22, 2025, Filing (Vermont SHPO concurrence with the Town's December 18, 2024, Section 106 consultation letter).

APPENDIX E

BIOLOGICAL ASSESSMENT

Affected Environment

Northern Long-eared Bat (NLEB)

The NLEB was listed as threatened by the FWS on May 4, 2015,[79] and reclassified as an endangered species on November 29, 2022[80] with an effective date of March 31, 2023.[81] No critical habitat has been designated for this species.

The NLEB is a medium-sized bat species with a body length of 3 to 3.7 inches, wingspan of 9 to 10 inches, and longer ears than other species in the *Myotis* genus (FWS, 2023a). The species ranges across 37 states, including most of the central and eastern United States, as well as the southern and central provinces of Canada, coinciding with the greatest abundance of forested areas.

The NLEB is insectivorous and 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 that are equal to or greater than 3 inches in diameter at breast height (dbh). In the fall season, NLEBs leave their forest habitats 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 between March and April. During the winter, small groups typically hibernate in cracks and crevices in the walls or ceilings of caves or abandoned mines with high humidity, cool temperatures, and no air currents, although hibernation has also been observed in buildings, railroad tunnels, and other man-made structures.

Hibernacula and surrounding forest habitats play important roles in the life cycle of the species, beyond the time when bats are overwintering, including for fall-swarming and spring-staging activities. Reproduction is limited to one pup per year in late spring and, therefore, populations can be slow to rebound from anthropogenic and naturally occurring mortality events. The primary threat to this species is white-nose syndrome, which was first observed in New York state in 2006 and has since spread beyond the Northeast and into the Midwest and Southeast (FWS, 2023a). Other threats include impacts to hibernacula and loss or degradation of summer habitat.

Although there is no documentation of NLEB at the project, upland and riparian forest at the project may provide suitable habitat for NLEB summer roosting and foraging activities.

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[79] 80 Fed. Reg. 17,974 (Apr.2, 2015).

[80] 87 Fed. Reg. 73,488 (Nov. 30, 2022).

[81] 88 Fed. Reg. 4,908 (Jan. 26, 2023).

Monarch Butterfly

On December 12, 2024, FWS proposed to list the monarch butterfly as threatened, based on threats including insecticide exposure and the loss and degradation of breeding, migratory, and overwintering habitats.[82] Adult monarch butterflies rely on diverse food sources during breeding and migration, including milkweed species (genus *Asclepias*) and nectar-rich flowers. Monarch butterflies are also dependent on milkweed species as host plants during egg-laying and larval development. In eastern North America, the monarch butterfly migrates between Mexico and Canada over a period of two to three successive generations. In Vermont, the monarch butterfly may be present during the summer months (FWS, 2021).

The project is located within the range of the monarch butterfly. There is no documentation of monarch butterfly at the project; however, as discussed in section 3.3.3.1, *Affected Environment, Vegetation,* milkweed plants that provide suitable habitat for monarch butterfly reproduction and foraging are known to occur within or near the proposed project boundary.

Environmental Effects

Northern Long-eared Bat

The Town proposes to construct the project facilities described in section 2.2.1, *Project Facilities*. To protect NLEB, the Town proposes to avoid the removal of non-hazardous trees that are equal to or greater than 3 inches dbh between April 1 and November 1 during construction and after the project is operational.

Corps special condition 1 requires the Town to restrict the removal of trees from April 15 to September 30 to minimize direct take of NLEB. The Corps indicates that a project specific survey could show species absence and result in the removal of this special condition.[83]

Our Analysis

Although no hibernacula, maternity colonies, or roosts are known to be present in the vicinity of the project, suitable summer habitat for NLEB is present within the proposed project boundary and the bats could occur at the project.

As part of project construction, the Town proposes to remove approximately 11 trees, all of which are equal to or greater than 3 inches dbh and could be used by NLEB for roosting. Routine project maintenance could include limited tree removal that affects habitat used by NLEB, including upland and riparian forest at the project that may provide suitable habitat for summer roosting and foraging activities. Any other tree removal would likely be limited to

[82] 89 Fed. Reg. 100,662 (Dec. 12, 2024).

[83] Consistent with the Town's proposal, Corps Vermont General Permit condition 12 requires the Town to restrict the removal of trees 3 inches dbh or greater from April 1 through October 31.

periodic removal of trees that are a threat to human life, property, or safe operation of the project (hazard trees).

The inactive season for NLEB in Vermont depends on whether the location of interest is within fall swarming or spring staging areas, which are expected to occur within 5 miles of hibernacula openings. For locations within fall swarming/spring staging areas, the inactive season is November 1 through April 14 (FWS, 2023b). For locations outside of fall swarming/spring staging areas, the inactive season is August 16 through April 14, unless within 1.5 miles of a known maternity roost then the inactive season is October 1 through April 14 (FWS, 2023c).

Avoiding the removal of potential roost trees during the active season would reduce the likelihood of disturbing NLEB and their newly born pups. There is no information in the record to indicate whether the proposed project is within 5 miles of any hibernacula or 1.5 miles of any maternity roosts. However, the Town's proposal to avoid the removal of trees that are equal to or greater than 3 inches dbh between April 1 and November 1, would fully encompass all potential active seasons for the NLEB in Vermont.[84] Therefore, all proposed tree removal would occur during the inactive season, regardless of the project's proximity to fall swarming/spring staging areas and maternity roosts. With the implementation of a cutting restriction for non-hazardous trees equal to or greater than 3 inches dbh between April 1 and November 1, we conclude that relicensing the project is not likely to adversely affect the NLEB.

Monarch Butterfly

The Town proposes to construct the project facilities described in section 2.2.1, *Project Facilities*. The Town proposes to revegetate disturbed areas with native vegetation following project construction.

As discussed in section 3.3.3, *Terrestrial Resources*, the Town currently maintains the lawn (i.e., mows) within a portion of the proposed project boundary. Following project construction, the Town proposes to continue mowing lawn areas within the proposed project boundary, including the fishing and boating access trail from June 1 to October 1.

The Town does not propose any specific measures for the protection of the monarch butterfly, and no stakeholders filed comments, recommendations, terms, or conditions regarding the monarch butterfly.

Our Analysis

Construction of the new project facilities has the potential to affect monarch butterfly if their habitat is destroyed and/or altered. Construction of the project would result in some temporary and permanent alteration/removal of small areas of terrestrial habitats.

As discussed in section 3.3.3, *Terrestrial Resources*, common milkweed is known to occur along the shoreline of the proposed impoundment. To access the project construction site

[84] The Town's proposal also includes the Corps special condition 1.

from the south, the Town proposes to construct a temporary road and staging area that extends north approximately 125 feet off Adams Mill Road down to the existing impoundment shoreline. Approximately 300 and 350 square feet of upland and wetland/river habitats, respectively, would be temporarily disturbed while using the south access area. Construction of the intake structure and sluiceway would involve clearing vegetation in an area of approximately 975 square feet located along the northeast corner of the mill building. Approximately 150 square feet of wetlands would be permanently removed from the existing intake for project construction. Construction of the proposed powerhouse and restoration of the tailrace area would involve clearing existing vegetation in an area of approximately 4,100 square feet located immediately west of the mill building. To provide recreation opportunities at the proposed project, the Town proposes to develop an approximately 485-foot-long fishing and boating access trail around the dam from the north shoreline of the impoundment to downstream of the tailrace, and associated access sites on the shoreline of the impoundment and the riverbank downstream of the tailrace. Most of the trail would be located over existing mowed or paved areas. Approximately 1,000 square feet and 1,500 square feet of existing vegetation would be disturbed at the impoundment and downstream access sites, respectively.

Following construction, the Town proposes to reseed some disturbed areas with native seed mixes and limit the recolonization/spread of invasive species. As discussed in section 4.1.2, *Construction Vegetation Management Plan*, staff recommends developing a construction vegetation management plan, in consultation with FWS and Vermont ANR, that includes: (1) revegetating project construction areas and restoring the pre-construction elevations and contours of land within 30 days of completing work in the areas; (2) a description of the project construction areas to be revegetated following construction, including acreages, topography, soil types, and existing vegetation; (3) a description of the measures to be taken to revegetate disturbed areas with native vegetation and seed, as proposed by the Town; (4) a description of the techniques and BMPs to be used to control the establishment, reintroduction, and spread of non-native invasive plants until disturbed areas are successfully revegetated, as proposed by the Town in the Invasive Species Plan; (5) a 2-year post-construction monitoring period that includes criteria for measuring the success of revegetation efforts and invasive species control efforts, and a description of procedures to be followed if monitoring shows that revegetation or invasive species control measures are not successful; (6) a schedule for filing reports on the progress of revegetation with the Commission; and (7) an implementation schedule that provides a timeline for initiating and completing construction-related vegetation management activities within disturbed areas. Development of a construction vegetation management plan would ensure that terrestrial habitats are restored at all disturbed sites in a timely manner. The plan would include a description of native vegetation and seed, including the potential use of native milkweed species such as common milkweed (*Asclepias syriaca*) and swamp milkweed (*Asclepias incarnata*) (Xerces Society, 2025).

Proposed vegetation maintenance activities (i.e., mowing) would occur around the hydropower and recreation facilities on a routine basis during the growing season, such that extensive stands of milkweed would not likely be present in those areas for monarch butterfly reproduction or foraging. In areas within the project boundary where routine vegetation maintenance does not/would not occur, potential monarch butterfly habitat would not likely be disturbed during the growing season.

With the development of construction vegetation management plan, any effects of the proposed project on the monarch butterfly and its habitat would likely be incidental and minor, and would not jeopardize the continued existence of the monarch butterfly.

APPENDIX F

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APPENDIX G

LIST OF PREPARERS

Arash Barsari – Need for Power, Engineering, and Land Use (Civil Engineer; B.S., Civil Engineering; M.S., Transportation Planning)

Rebecca Brodeur – Cultural Resources (Archaeologist; B.A., Anthropology; M.A., History)

Joshua Dub – Project Licensing Coordinator, Geology and Soils, Aquatic Resources, Terrestrial Resources, Threatened and Endangered Species (Fish Biologist; B.S., Biology; M.S., Natural Resources and Environmental Sciences)

David Moore – Recreation and Aesthetic Resources (Outdoor Recreation Planner; B.S., Psychology/Biology)