Lower Swanton Hydroelectric Project (P-15280)

Joint Agency Meeting
Swanton, VT
November 15, 2022

Stone Ridge Hydro

Stonecat Hydro, LLC

Lower Swanton Project – FERC Licensing Process

Agenda

- Introductions/Meeting Purpose
- Relicensing process
- Project overview
- Existing environment
- Proposed measures
- Next steps
- Site visit logistics
- Evening Session for Public

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Meeting Purpose

- Initial consultation meeting for the licensing of the Lower Swanton Dam (P-15280)
- Review Lower Swanton Hydro Project, FERC licensing process and schedule
- Provide agencies and stakeholders information pertaining to existing Project facilities and resources
- Identify any additional relevant existing information pertaining to the Project area resources
- Review process for submittal of comments, additional information, and study requests for the development of the FERC license application

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Lower Swanton Dam Project TLP Pre-filing Schedule

Activity	Timeframe	Date
Stage 1 - Initial Consultation		
Notice of Intent (NOI); Pre-Application Document (PAD); Request to Use TLP Submittal	5 Years Prior to License Expiration	
FERC Approval of TLP	60 Days After NOI, PAD, TLP Request	
Joint Agency Consultation Meeting	30-60 Days After TLP Approval	
End of PAD Comment/Study Request Period	60 Days After Consultation Meeting	
Stage 2 - Studies and Draft Application		
Resource Studies • Study Plan Development • Agency Consultation • Study Implementation • Study Reports	During 2023 and 2024 seasons and final reports incorporated into Draft License Application	2023 & 2024 Field Seasons
Draft License Application (DLA) Submittal	Approximately 150 Days Before Final License Application	Spring 2023
End of DLA Comment Period	90 Days After DLA Submittal	Summer 2023
Stage 3 - Final Application		
Final License Application (FLA) Submittal		
License Expiration		

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FERC Relicensing Activities to Date

- Stonecat Hydro submitted Notice of Intent (NOI) and Pre-application Document (PAD) to FERC, agencies and stakeholders on July 5, 2022. Lower Swanton project is following the FERC Traditional Licensing Process (TLP)
  - Concurrent with the NOI/PAD filing, Stonecat Hydro requested use of the TLP
  - Public Notice of Joint Meeting and Site Visit provided in the St. Albans Messenger on Nov 15, 2022

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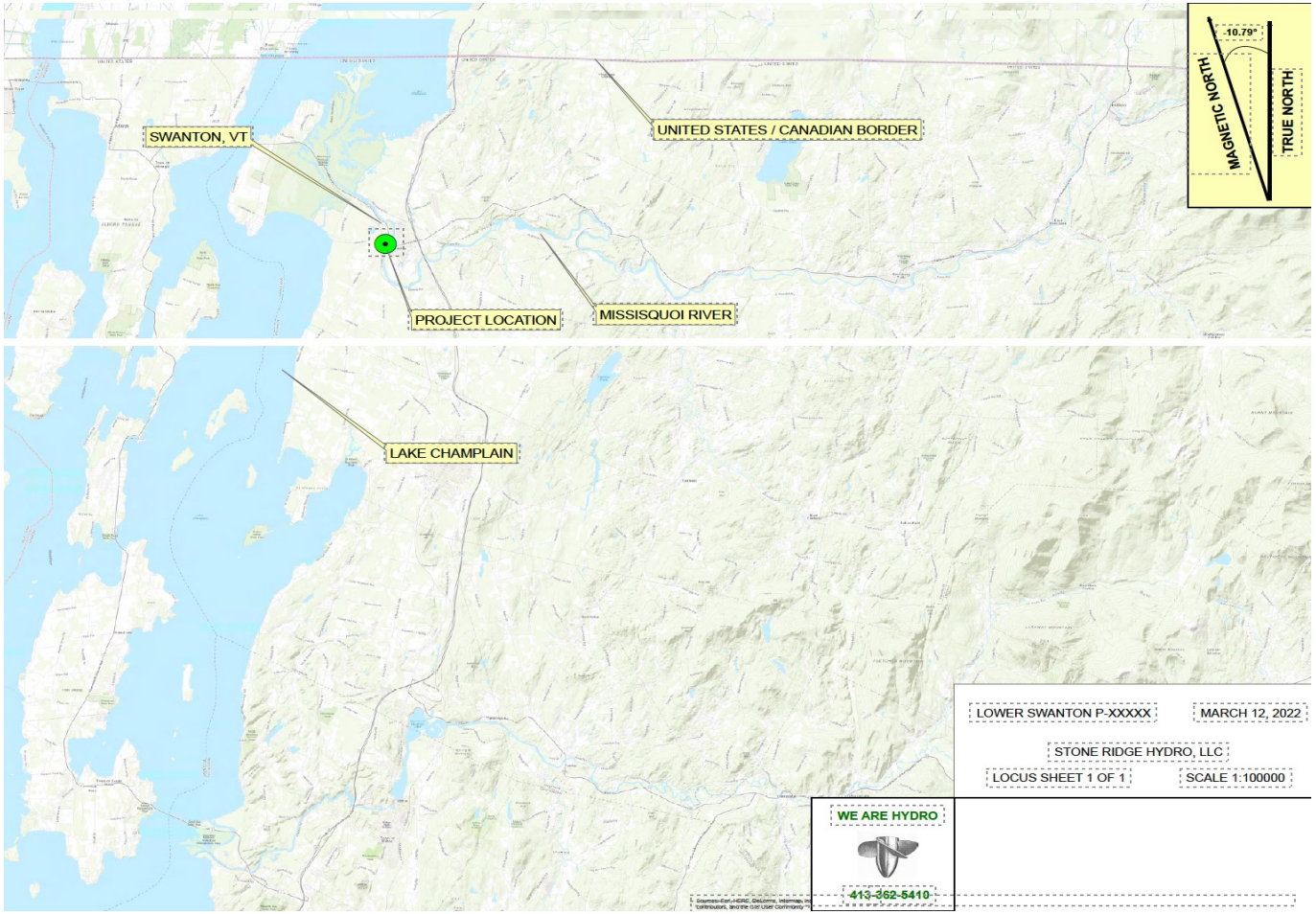
General Project Location



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Hydroelectric Projects on the Missisiquoi River

Name	Town	Length (ft.)	Impoundment (acres)	Height (ft.)	FERC No.	Owner
Troy Hydroelectric	Troy	232	36	20	13381-Exemption	Troy Mills Hydroelectric Inc.
North Troy Hydroelectric	Troy	95	1	14	10172-Exemption	Missisquoi River Hydro, LLC
Richford Reservoir	Richford	-	1.3	20	-	Town of Richford, VT
Enosburg Falls Hydroelectric	Enosburgh	300	65	30	2905	Village of Enosburg Falls
Sheldon Springs Hydroelectric	Sheldon	283	175	54	7186	Missisquoi, LLC
Highgate Falls Hydroelectric	Highgate	380	65	45	2547	Village of Swanton
Lower Swanton	Swanton	410	150	12		Village of Swanton

Source: (VANR, 2004)

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Existing Project Description:

The existing project consists of an existing 170 acre impoundment with an average depth of 5 feet, an approximately 8 foot tall concrete overflow spillway and a former concrete power canal approximately 300 feet long and 12 feet wide.

The proposed project will utilize the existing dam but add two feet of flashboards to the crest of the existing dam to raise the elevation of the reservoir from 108 feet MSL to 110 feet MSL.

The former concrete power canal will be reconstructed to house a new fish passage structure which will be designed and specified in consultation with resource Agencies.

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Proposed Project:

An existing dam approximately 360 feet long with a maximum height of 12 feet, crest elevation of 108.0 MSL and new flashboards resulting in a normal water surface elevation of 110.0 MSL.

An impoundment with a surface area of about 180 acres at a water surface elevation of 110.0 MSL.

A former concrete power canal approximately 300 feet long, 12 feet wide to be reutilized for new fish passage and a new concrete intake structure approximately 100 feet wide and 60 feet long located on the right embankment.

A new concrete powerhouse approximately 60 feet wide and 100 feet long housing three turbines with a combined total capacity of 850 kW.

A new tailrace excavated from the existing bedrock about 60 feet wide and 150 feet long.

A new transmission line with a total length of approximately 200 feet at 12.47kV; and (8) other appurtenances.

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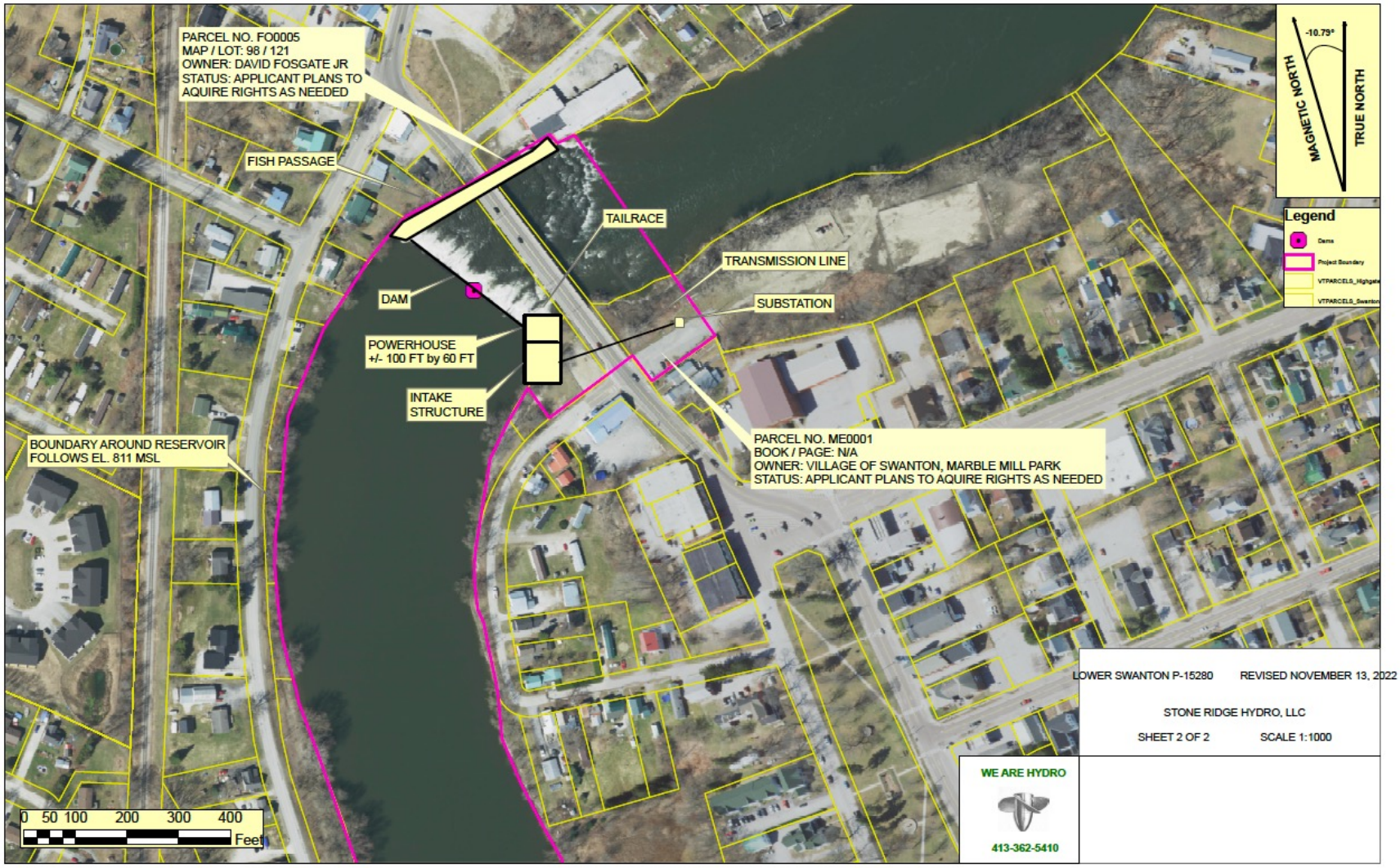

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Proposed Project:

The proposed project will include the construction of a new intake structure, powerhouse and tailrace on the right side intake.

The design process is still in progress; however, it is anticipated that three horizontal Kaplan turbines with a total combined capacity of 850 kW will be installed in the powerhouse.

The powerhouse and intake structure will be constructed of reinforced concrete.

The intake structure will be 100 feet wide and 60 feet long and transition flow into a 60 feet wide 100 feet long powerhouse.

It is anticipated that the powerhouse will displace approximately 55 feet of spillway length resulting in a spillway about 275 feet in length.

The intake structure will include a trashracks adequate for downstream fish protection and an adjacent downstream fish bypass. The fish bypass will be designed in consultation with resource agencies.

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Proposed Project: Hydrology and Projected Flows

There is a USGS Gage located in the project impoundment in close proximity to the dam. The gage's period of record is 1990 to present. For project flows and flow duration curves, a 20 year period of record was utilized (2002-2021).

According to the USGS gage website, the drainage area of the gage is 850 square miles and according to a stream stats analysis the drainage area of the project is 852 square miles. Since these values are within less than 1% of each other, no drainage area ratio was applied.

During normal operations, it is anticipated that the first 20 cfs in the river will go to the aesthetic flow. The minimum operating flow of a single turbine is 70 cfs. Therefore a minimum of 90 cfs in the river is required to operate the turbines. At river flows between 1-89 cfs, all flows are discharged from the dam. At river flows between 90-1,400 cfs, 20 cfs spills for aesthetic flows and 70-1,380 cfs is discharged from the turbines. At river flows above 1,400 cfs, 1,380 cfs is discharged from the turbines, and all remaining flows are discharged over the spillway.

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Proposed Project: Hydrology and Projected Flows

Historical Flows USGS Gage #04294000

Month	Maximum Recorded Flow (cfs)	Average Recorded Flow (cfs)	Minimum Recorded Flow (cfs)
All	26,200	1,912	79
Jan	19,400	1,668	360
Feb	21,100	1,177	261
Mar	14,600	2,705	258
Apr	25,500	4,799	712
May	25,800	2,369	245
Jun	23,100	1,654	91
Jul	8,720	946	114
Aug	19,800	886	79
Sep	12,300	692	82
Oct	16,800	1,770	90
Nov	26,200	2,130	435
Dec	16,500	2,140	256

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Proposed Project:

The existing dam is not currently operating. There are no outlets or gates for dam operation purposes. There is a gate structure that controlled water into the former power canal. The gate is in disrepair and does not appear operable. The proposed Project's mode of operation is run-of-river mode. The hydraulic capacity of the units range from a minimum of 70 cfs to a maximum of 1,380 cfs.

All three proposed units have a hydraulic range of 70-460 cfs each. Project flows which pass through the turbines will discharge back into the Missisquoi River immediately at the toe of the dam. Since the tailwater will backwater the toe of the dam, environmental bypass flows are not anticipated. However, it is anticipated that an aesthetic flow of 1" will be required over the flashboards, as is typically required by the State of Vermont. For a post construction spillway length of 275 feet, the aesthetic flow will be about 20 cfs.

In addition, it is anticipated that there will be seasonal flow requirements for the upstream and downstream fish passage. USFWS Region 5 Fish Passage Engineering Design Criteria (USFWS 2016) require a minimum of 4-5% station capacity which would be 55-70 cfs. Upstream fish passage will need both operational and attraction flows.

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Proposed Project: Turbine and Generator Unit Design

Parameter	Unit # 1	Unit # 2	Unit # 3
Turbine Type	Full Kaplan	Full Kaplan	Full Kaplan
Orientation	Horizontal	Horizontal	Horizontal
Maximum Hydraulic Capacity (cfs)	460	460	460
Minimum Hydraulic Capacity (cfs)	70	70	70
Generator Voltage	600VAC	600VAC	600VAC
Generator Type	Induction	Induction	Induction
Generator Rating (kW)	283.3	283.3	283.3

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Existing Environment – Past and Present Challenges

Over the last twenty years, there has been there have been ongoing discussions for many years regarding the Lower Swanton Dam, including possible removal and improving power generation (see “Remove the Swanton Dam: Bring Back the Fish”, Laroche, VFWD Commissioner).

Fish resources in the lower Missisquoi River are complex and controversial. There are resident species, migratory species, RTE species, stocked species and invasive species. There are concurrent efforts to improve access to spawning habitat for certain species while implementing population control methods for others. A clear understanding of the biological and ecological goals and management efforts are key.

In a response to the Missisquoi Bay Basin Plan (VOS 2008), the Village outlines a variety of arguments as to the dam’s public benefit; including, but not limited to: historic significance, recreation, sources of water for fire suppression and a survey of the populous indicating more than 75% want to keep the dam in place. Separately, we are in a climate crisis and once again the world is strained over energy resources.

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Existing Environment – Past and Present Challenges

Through a collaborative effort, it is possible for ***everyone*** to meet their goals at this project. Development of the proposed hydropower project provides an opportunity to utilize the dam for its intended purpose; while at the same time, provide environmental enhancements such as fish passage.

The applicant has a reasonable expectation that both upstream and downstream passage will be necessary at the project. At this point, the applicant is assuming a standard downstream bypass structure in accordance with USFWS Region 5 Design Guidelines (USFWS 2016).

There are a variety of options for upstream passage including a denil ladder, natural channel, etc. Although the dam has blocked important species from passing upstream for more than 100 years, it has also blocked the passage of unwanted species. The upstream passage must consider how prevent the introduction of invasive such as lamprey.

This is particularly complicated, but the applicant will work with Agencies to find a solution that will meet all science based, clear and reasonable goals.

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Proposed Studies

Resource	Potential Impact
Water	Minimal impact. Run of River Operations. Existing Dam. Proposed DO/Temp Study.
Geology & Soils	Minimal impact. Existing Dam.
Fish & Aquatic	Known migratory species in vicinity of project. Project will provide improvement over existing condition through construction of fish passage facilities. Proposed fish passage study.
Wildlife & Botanical	Minimal impact. Run of River Operations. Existing Dam. Proposed mussel study to better understand site specific colonies.
Floodplain, Wetlands, Riparian & Littoral Habitat	Minimal impact. Run of River Operations. Existing Dam.
RTE Species	Minimal impact. Run of River Operations. Existing Dam.
Recreation & Land Use	Minimal impact. Run of River Operations. Existing Dam.
Cultural & Historic	Minimal impact. Run of River Operations. Existing Dam.
Socioeconomic	Minimal impact. Run of River Operations. Existing Dam.
Aesthetic	Minimal impact. Run of River Operations. Existing Dam. Proposed 1” spill in accordance with typical State request.
Tribal	Minimal impact. Run of River Operations. Existing Dam.

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Geology

The Swanton Project is located in the Vermont Lowlands. There are five distinct physiographic regions of Vermont. Categorized by geological and physical attributes, they are 1) the Northeastern Highlands, 2) the Green Mountains, 3) the Taconic Mountains, 4) the Champlain Lowlands, and 5) the Vermont Piedmont (SMC 2011) (Wiki 2022).

The Vermont Lowlands are on the western side of the state. The region extends from the Canadian border in the north to the Poultney River and the Brandon area. The Adirondack Mountains to the west in New York, and the Green Mountains to the east rise high enough to protect the area from storms. This factor, along with the low average elevation of the valley area, helps keep the climate milder than the rest of the state. This region contains the largest amount of flat and gently rolling land in the state. Most of the land lies below 1,500 feet in elevation.

Agriculture is important in this region. There is a long growing season and the soil is fertile. Franklin and Addison counties are the most important farming areas (SMC 2011). The dam is constructed in an Iberville Formation (Upper Ordovician) consisting of dark-gray shale with thin discontinuous beds of cross bedded and graded siltstone.

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Soils

Development of a hydropower project is not anticipated to have any effect on soils or geology within the project area. NRCS Report included in Appendix E of PAD.

Water Resources – Water Quality

Hydroelectric generation utilizes non-consumptive, once-through use of water without chemicals, nutrients or other non-water discharges. Therefore, it does not contribute to the levels of Chloride, Nitrates/Nitrogen, phosphorus or E. Coli in rivers.

The primary concern regarding hydropower generation and water quality is temperature and dissolved oxygen (DO). Although there is data for water quality in the lower Missisquoi River, it did not include DO. No parameters outside the water quality standards were identified. However, since DO data was not available and the impact of new generation is not known it is assumed that additional DO & temperature data will be needed.

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Fish and Aquatic Resources

The Missisquoi River is a major tributary to Lake Champlain and is used by numerous fish species that enter the river seasonally because they require riverine habitat to reproduce.

According to VANR, one of the primary spawning areas is the habitat immediately downstream of the Swanton Dam, which has a steeper gradient and habitat used by numerous lake-run fish species for spawning, including walleye, esocids (pike species), redhorse suckers, white suckers, brown bullhead, smallmouth bass, freshwater drum, longnose gar, yellow perch, white perch and minnow species (for example, common shiner, creek chub, fallfish, eastern silvery minnow).

In addition to these lake-run species, there are several state listed threatened and endangered species found in the lower Missisquoi, including lake sturgeon, stonecat, eastern sand darter and various mussel species. (VANR 2015)

Recently a program was undertaken to reintroduce muskellunge in the lower Missisquoi River and bay. Species like largemouth bass, northern pike, chain pickerel, yellow perch also reside in the river year round. (VANR 2015)

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Wildlife and Botanical Resource

The PAD provides descriptions of Wildlife and Botanical Resources.

The proposed hydropower project is not anticipated to have any long-term adverse effects on wildlife and botanical resources.

The PAD, Appendix E, provides lists of mammals, birds, amphibians and reptiles that may occur in the Project vicinity based on species distribution and habitat preferences.

Potential rare, threated, and endangered (RTE) Species within the vicinity of the Project include:

- The federally threatened, state endangered northern long-eared bat (*Myotis septentrionalis*)
- The federally threatened, state endangered monarch butterfly (*Danaus plexippus*)

It is not anticipated that the project development will have an impact on the extent and or function of the existing floodplain resources within or in the vicinity of the project. Even with the addition of two feet of flashboards, the water level will be contained within the existing banks and the proposed water surface.

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Wetlands, Riparian and Littoral Resources

USFWS National Wetlands Inventory (NWI) database

R2UBH:
System Riverine (R) Subsystem Lower Perennial (2)
Class Unconsolidated Bottom (UB)
Water Regime Permanently Flooded (H)

PEM1C:
System Palustrine (P)
Class Emergent (EM)

PFO1C:
System Palustrine (P)

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Project Recreation Access

At the project site, fishing and canoeing are the main recreational uses. There is an informal canoe portage and fishing access area upstream and downstream of the project. Marble Mill Park, located just downstream of the proposed project and developed with funding from Interior through the Land and Water Conservation Fund (LWCF), provides picnic and playground facilities.

The Vermont Department of Forests, Parks, and Recreation operates the 26.4 mile-long Missisquoi Valley Rail Trail from Richford to St. Albans, a portion of which runs through Franklin County (SCORP 2014). The Missisquoi River offers recreationists the opportunity for canoeing, swimming, fishing, picnicking, hunting, and nature trails.

It is not anticipated that development of the hydropower project will have any impact to the existing recreational and land uses.

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Aesthetic Resources

There are no aesthetic requirements associated with this project's current license.

The proposed Lower Swanton Dam Project impoundment is bordered by forest, residential areas, and some agricultural areas near the northmost end of the impoundment.

Cultural Resources

No pre-historical archaeological surveys have been completed in accordance with the Lower Swanton Dam Project. * There were no known historical, cultural, or archaeological resources that would be affected by the project.

There are no known historic, cultural, or archaeological resources that would be affected by operations at the project.

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Tribal Resources

There are no Federally recognized Tribes in the State of Vermont. (NCSL 2021a) However, there are four Tribes recognized by the State of Vermont as follows (NCSL 2021b):

Elnu Abenaki Tribe (http://elnuabenakitribe.org/)

Nulhegan Band of the Coosuk Abenaki Nation (https://abenakitribe.org/)

Koasek Abenaki Tribe (https://koasek-abenaki.com/)

Missisquoi Abenaki Tribe (https://www.abenakination.com/)

On April 22, 2011 the Elnu Abenaki Tribe and Nulhegan Abenaki Tribe received tribal recognition by the State of Vermont. On May 7, 2012 The Koasek Band of the Kao Abenaki Nation and Abenaki Nation at Missisquoi received tribal recognition by the State of Vermont (VCNAA 2021). Outreach to all four Abenaki tribal bands listed above will be completed as part of project development.

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Comments and Study Requests

- Submit PAD comments, additional relevant information and study requests to Stonecat Hydro within 60 Days

Other Additional Existing Information

- Information pertaining to Project area resources?
- Additional relevant regional management plans?
- Any additional known information and existing studies?

Resource Studies

- To be conducted during 2023 and 2024 (if needed) field season
- Study Plan Development – Spring 2023
- Agency Consultation – Spring 2023
- Study Implementation and Reports – 2023 and 2024

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Study Requests Information

- Describe goals and objectives of the proposed study
- Explain relevant resource management goals or relevant public interest considerations
- Describe existing information and the need for additional information
- Explain the nexus between project operations and effects on resource to be studied and how the study results would inform the development of license requirements
- Explain how methodology and how it is consistent with generally accepted scientific practice
- Include requested preferred data collection and analysis techniques and schedule
- Describe level of effort and cost
- **Comment/Request**

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Public Comments

Lower Swanton Hydroelectric Project (FERC No. 15280)

E-Subscribe: http://www.ferc.gov/docs-filing/esubscription.asp

Written Correspondence:

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Federal Energy Regulatory Commission

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Electronic Correspondence:

http://www.ferc.gov/docs-filing/efiling.asp

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