



Stage II Recertification Review
For Lower Raquette River Project
Low Impact Hydropower Institute's (LIHI) #14C

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APPENDICES



1. BACKGROUND

In 2014, LIHI determined that LIHI certificate #14, needed to be separated into three smaller LIHI certificates to help reduce the overall size and complexity of the issues. The developments in the Federal Energy Regulatory Commission's (FERC) licenses P-2060 and P-2084 are now defined as the Upper Raquette River Project (URRP, LIHI #14A). The developments in FERC license P-2320 are now defined as the Middle Raquette River Project (MRRP, LIHI #14B). The Lower Raquette River Project (LRRP, LIHI #14C) with FERC license P-2330 comprised of the Erie Boulevard Hydropower's (EBH) Norwood, East Norfolk, Norfolk, and Raymondville hydro developments.

In 1999, Niagara Mohawk Power Company (NMPC) sold their entire hydropower portfolio to Orion Power. EBH was created as a subsidiary of the newly formed company dealing with the operation of the hydropower assets. Orion Power was eventually acquired through a succession of sales and purchases by the Brookfield Renewable Energy Group (BREG), the current owner of EBH. On February 13, 2002, the FERC issued the LRRP license for a term of 31 years and 11 months, ending on December 31, 2033.¹ The FERC issued the LRRP an amended license (LRRAL) on December 05, 2006².

On November 12, 2018, LIHI sent a reminder letter to EBH stating that LRRP's current LIHI certification would expire on July 9, 2019. EBH submitted a LIHI application for LRRP recertification on May 31, 2019. On July 9, 2019, to allow sufficient time for the recertification process to be completed, LIHI extended the certification term of the LRRP to November 30, 2019. EBH's LIHI coordinator is Daniel J. Maguire³.

The Stage I recertification review was completed July 2, 2019. Given the review was processed under the new, Second Edition LIHI Certification Handbook, the need for a Stage II review is necessary. The Stage I review deemed it unnecessary to submit a new revised application, but found supplemental information was needed. However, EBH resubmitted a revised LIHI application for recertification on September 3, 2019.

2. RAQUETE RIVER BASIN

The Raquette River, with a total drainage basin of 1,269 square miles at its mouth, originates in the Adirondack highlands at Blue Mountain Lake, Raquette Lake and Long Lake. The river flows generally north-northwest for more than 146 miles, through Potsdam, New York, and empties into the St. Lawrence River, near Massena, New York into the St. Lawrence River/Seaway at the St. Regis Indian Reservation in Franklin County. The area experiences cold, snowy winters and short summers. Annual precipitation is about 40 inches. As the river flows north, it transitions from cold water habitat to a cool water aquatic fishery as the river reaches the lower gradients. Most of the basin is sparsely populated, with much of the land forested and brush land.

In the Raquette River headwaters, EBH's Piercefield development (FERC No. 7387) at RM 88.5 releases flow into the Carry Falls impoundment which impounds 877 square miles (SQMI) of drainage (See Figure 1). Carry Falls' seasonal storage pond is the largest on the Raquette River and is used to store and regulate most of this upstream flow through the remaining URRP developments and EBH's downstream MRRP and LRRP developments.

¹ FERC license - <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=11860653>

² 2006 Amended LRRP License - <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=11199505>

³ Daniel J. Maguire, P.E., EBH Compliance Manager, 184 Elm Street, Potsdam, NY 13676 - 315-267-1036 - Danny.Maguire@brookfieldrenewable.com



EBH's URRP developments include:

- Carry Falls Development, located at RM 68 and licensed as FERC No. 2060.
- Stark Development located at RM 66 and licensed as FERC No. 2084.
- Blake Development located at RM 62 and licensed as FERC No. 2084.
- Rainbow Falls Development located at RM 56 and licensed as FERC No. 2084.
- Five Falls Development located at RM 54 and licensed as FERC No. 2084.
- South Colton Development located at RM 52 and licensed as FERC No. 2084.

EBH's MRRP developments include:

- Higley Development located at RM 47 and licensed as FERC No. 2320.
- Colton Development located at RM 45 and licensed as FERC No. 2320.
- Hannawa Development located at RM 39 and licensed as FERC No. 2320.
- Sugar Island Development located at RM 38 and licensed as FERC No. 2320.



Figure 1 - Location Map

Flows downstream of Sugar Island travel through:

- The Potsdam Project (FERC No. 2869) at RM 35, owned by the Village of Potsdam.
- The Sissonville Limited Partnership's (SLP) Sissonville Project (FERC No. 9260) at RM 33.
- EBH's Hewittville Project (FERC No. 2499) at RM 32.
- EBH's Unionville Project (FERC No. 2498) at RM 31.

All four projects have individual dams and impoundments and operate in an instantaneous run of river (ROR) mode.

Flow below Unionville enters EBH's LRRP developments. The LRRP developments include:

- Norwood Development located at RM 28.0 and licensed as FERC No. 2330.
- East Norfolk Development located at RM 23.5 and licensed as FERC No. 2330.
- Norfolk Development located at RM 22.5 and licensed as FERC No. 2330.
- Raymondville Development located at RM 20.0 and licensed as FERC No. 2330.

EBH's Yaleville Project (LIHI #157), located at RM 25.0 (3.0 miles downstream of the Norwood development and 1.5 miles upstream of the East Norfolk development) is licensed as FERC No. 9222.

Downstream fish passage is provided at all the upstream facilities except at Carry Falls, Hewittville, and Unionville. Downstream fish passage is scheduled for future construction at Hewittville and Unionville in 2020. Seasonal upstream eel passage is provided at all downstream dams.



3. REGULATORY SUMMARY

A. Summary of Project Licensing and Agency Consultation

The original license for the LRRP was issued in 1964, with an expiration date of December 31, 1993. From January 1, 1994 until the issuance of the 2002 FERC license, the project operated under annual licenses.

NMPC, the predecessor of EBH⁴, filed a new license application in 1991. Notice of the relicense application was issued by FERC on February 23, 1993. The U.S. Department of the Interior (USDOI), Adirondack Mountain Club (AMC), the New York State Adirondack Park Agency (NYSPA), the New York State Department of Environmental Conservation (NYSDEC), American Whitewater (AW), American Rivers (AR), the Adirondack Council (AC), the Association for the Protection of the Adirondacks (APA), the National Audubon Society of New York (NASNY), the Natural Heritage Institute (NHI) and New York Rivers United (NYRU) filed motions to intervene in the proceeding.

In 1995, parties to the FERC relicensing proceedings for the LRRP and the MRRP requested that all proceedings be combined with the FERC relicense for the URRP. On December 13, 1995, the FERC approved the request and NMPC agreed to accelerate the FERC relicensing of the URRP⁵.

On April 22, 1998, NMPC filed the Raquette River Project Offer of Settlement (RRPSO)⁶. The RRPSO signatories included NMPC, the NYSDEC, the U.S. Department of the Interior's Fish and Wildlife Service (USFWS), AMC, NYRU, AC, APA, the American Canoe Association (ACA), the National Park Service (NPS), the New York State Conservation Council (NYSCC), the North Country Raquette River Advocates (NCRRA), St. Lawrence County, and the Jordan Club. The New York Power Authority (NYPA) and the New York Council of Trout Unlimited (TUNY) participated in the proceeding and had no objections but chose not to become signatories.

The RRPSO provides for minimum flows releases, limitations on impoundment fluctuations, and fish passage and protection measures to protect and enhance the water quality and fishery resources of the Raquette River. It also provides for enhanced recreational opportunities in a manner that is consistent with the undeveloped nature of the surroundings. Shortly thereafter, the NYSDEC issued a Water Quality Certificate (WQC) for the Raquette River on June 11, 1998⁷.

On February 10, 1999, NMPC filed notice of a new license application reflecting the provisions of the RRPSO and the WQC⁸. The USDOI, AMC and the NYPA filed motions to intervene in the proceeding.

On June 16, 2000, the FERC issued a Draft Environmental Assessment (DEA)⁹. The USDOI, NYSDEC, the St. Regis Mohawk Tribe, AMC, and EBH, which early in 1999 acquired all of NMPC's hydro assets, filed comments on the DEA.

⁴ In 1999, NMPC sold their entire hydropower portfolio to Orion Power. EBH was created as a subsidiary of the newly formed company dealing with the operation of the hydropower assets. Orion Power was eventually acquired through a secession of sales and purchases by BREG, current owner of EBH.

⁵ <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=8299440:1>

⁶ RRPSO - http://elibrary.ferc.gov/idmws/search/intermediate.asp?link_info=yes&doclist=1845587.

⁷ <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=55627>

⁸ <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=3150004>

⁹ <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=8057323:1>



On April 18, 2001, the FERC issued a final EA (EA)¹⁰. The EA concluded that relicensing the four projects would not significantly impact the quality of the human environment and recommended issuance of new licenses as proposed in the applications.

On February 13, 2002, the FERC issued separate licenses for the Carry Falls Project (P-2060)¹¹, the URRP (P-2084)¹², the MRRP (P-2320)¹³ and the LRRP (P-2330)¹⁴. The term for each license was for 31 years and 11 months ending on December 31, 2033.

Key issues in the LRRP's 2002 FERC license included:

- Providing minimum flows in bypass reaches;
- Providing flows for fish spawning and downstream passage;
- Providing a minimum base flow in the river below Raymondville;
- Reducing reservoir drawdowns and fluctuation limits;
- Constructing portage facilities and trails at many of the developments;
- Maintaining and improving recreation access;
- Transferring certain lands for recreational access into the project boundary;
- Establishing a Raquette River Advisory Committee (RRAC) to advise and provide comments on the recreation plan for the projects, and to approve expenditure of a \$5000 annual fund for mitigation and enhancement projects; and
- Development of a stream flow and water level monitoring plan (SWLMP).

On July 3, 2006, to accelerate installation of capacity additions and completion of some operational concerns, EBH filed an application to amend the LRRP license. The NYSDEC issued its revised WQC on October 13, 2006.¹⁵ The FERC issued the LRRAL on December 05, 2006¹⁶.

In the LRRAL, EBH agreed:

- To operate the LRRP developments in accordance with the 2006 WQC;
- To increase the authorized generating capacity by replacing the existing turbine in the powerhouse of each of the four developments, Norwood, East Norfolk, Norfolk, and Raymondville (increased capacities were not noted in the recertification application);
- To operate the impoundments in a ROR mode;
- To develop and submit to the NYSDEC a revised SWLMP within six months after issuance of the license amendment;
- To install one-inch trashracks at the Norwood development in 2007; and
- To install upstream eel passage at each LRRP development.

Since the WQC was issued more than ten years ago, EBH requested the NYSDEC to reconfirm the legitimacy of the WQC in a letter or email statement. In an email dated August 14, 2019, the NYSDEC stated that the 2006 WQC is still valid with regard to the operation of the LRRP (See Appendix A, page A-19).

¹⁰ <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=164819:1>

¹¹ FERC license for (P-2060) - <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13707255>

¹² FERC license for (P-2084) - <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=11860652>

¹³ FERC license for (P-2320) - <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13707261>

¹⁴ FERC license for (P-2330) - <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=11860653>

¹⁵ October 13, 2006 WQC - <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=11162942>

¹⁶ 2006 Amended LRRP License - <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=11199505>



B. Compliance Issues

From 2009 through 2014, a total of 34 impoundment deviations occurred. Of these, twelve were filed as CEII with causes unknown. The majority of the remaining 22 deviations were caused by issues related to trashrack monitoring/raking, maintenance of equipment, SCADA program logic or operator error. In response, LIHI recertified the LRRP from 2014 to 2019 with two conditions that required EBH to submit a Deviation Reduction Plan (DRP) to identify proactive approaches to reduce the likelihood of future operational deviations within 3 months after recertification and to report annually on all deviations.

In 2015, under the current LIHI certification, the number and extent of deviations decreased significantly, but eight base flow deviations occurred at the Raymondville facility. On November 13, 2015, the FERC considered two of these deviations to be violations of license Article 402¹⁷. EBH informed FERC that a main cause of these deviations was that the USGS gage at Raymondville does not accurately represent flows at the hydrologically sensitive cemetery riffle river location under all river flow conditions. FERC directed EBH to consult with resource agencies to conduct a flow routing study to determine the correlation between the USGS gage readings at Raymondville and the flow measured at the downstream cemetery riffle river location. The study was completed in 2017.

From 2016 to August 2019, EBH reported six base flow deviations below the Raymondville development, which indicates that base flow deviations still occur. These excursions occurred on: July 19, 2016¹⁸, October 8, 2016¹⁹, November 24, 2016²⁰, June 10, 2018²¹, July 14, 2018²² and July 5-6, 2019²³. Causes of the deviations were related to mechanical issues or transmission system problems leading to unit trips, and in one case to a drop in inflows from upstream projects not owned by EBH. FERC did not consider any of these deviations to be license violations.

4. PROJECT DESCRIPTION

The LRRP is located on the Raquette River in St. Lawrence County, New York, about ten miles below the MRRP. The LRRP consists of four developments, Norwood, East Norfolk, Norfolk, and Raymondville. Each development has a dam, reservoir, and powerhouse. From 2002 to about 2007, the LRRP was operated as described in the RRPSO, submitted to FERC on April 22, 1998²⁴ and incorporated into the 2002 FERC license.²⁵

On June 30, 2006, EBH filed an application with the NYSDEC for a WQC for proposed turbine upgrades. The NYSDEC issued its WQC on October 13, 2006.²⁶ The WQC conditions required:

- That the WQC issued for the Project upon its relicensing in February 2002 continues to be in full force;
- EBH to operate the impoundments in a ROR mode;

¹⁷ <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14044066>

¹⁸ <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14334098>

¹⁹ <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14379086>

²⁰ <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14435579>

²¹ <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14950341>

²² <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14977444>

²³ <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=15305418>

²⁴ RRPSO - http://elibrary.ferc.gov/idmws/search/intermediate.asp?link_info=yes&doclist=1845587

²⁵ FERC License - <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=11860653>

²⁶ October 13, 2006 WQC - <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=11162942>



- EBH to develop and submit to the NYSDEC a revised SWLMP within six months after issuance of the license amendment;
- EBH to install one-inch trashracks at the Norwood development in 2007; and
- EBH to install upstream eel passage at each development.

On December 5, 2006, FERC issued an amended license for the LRRP (P-2330)²⁷ that incorporated conditions of the WQC. The amended license authorized replacing the existing turbines for all four developments (Norwood, East Norfolk, Norfolk, and Raymondville) and changed their operation to a ROR mode. The overall installed capacity increased from 12.0 megawatts (MW) to 18 MW.

Additionally, EBH agreed to accelerate the implementation of the fish protection and downstream passage measures at the Norwood development from 2010 to 2007 and install upstream eel passage at all four developments.

Each LRRP development was constructed in 1928 and contained a single vertical turbine. The replacement of the four turbines and associated generator rewinds resulted in increasing the total hydraulic capacity of the LRRP from 6,625 cubic feet per second (CFS) to 8,503 CFS and the average annual generation (AAG) by 24.9 gigawatt-hour (GWh) per year.

The Norwood development's single vertical turbine with an installed capacity of 2.0 MW was upgraded to a Kaplan runner upgrade with an installed capacity of 3.1 MW and hydraulic capacity increased from approximately 1,580 CFS to 2,099 CFS. The new runner allows better utilization of the existing generator capacity resulting in an additional output of 4.43 GWh per year.

The East Norfolk development's single vertical turbine-generator with an installed capacity of 3.0 MW was upgraded to a Kaplan runner with an installed capacity of 4.8 MW and the hydraulic capacity increased from approximately 1,635 CFS to 2,067 CFS. The new runner's increase in output required a generator rewind and replacement of the step-up transformer. AAG increased by 5.94 GWh.

The Norfolk development's single vertical turbine with an installed capacity of 4.5 MW was upgraded to a Kaplan runner with an installed capacity of 7.0 MW and the hydraulic capacity increased from approximately 1,770 CFS to 2,238 CFS. The new runner allows better utilization of the existing generator capacity resulting in an additional output of 9.72 GWh per year.

The Raymondville development's single unit rated for 2.0 MW was upgraded with a Kaplan runner upgrade increasing the installed capacity to 3.1 MW and the hydraulic capacity from approximately 1,640 CFS to 2,099 CFS. The new runner allows better utilization of the existing generator capacity resulting in an additional 4.83 GWh per year.

These development improvements were completed and placed in service in 2008 (See Table 1).

²⁷ FERC Amended License - <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=11199505>



Development	River Mile	Latitude of Dam	Longitude of Dam	Installed Capacity (MW)
Norwood	28.0	44.743300	-75.00530	3.1
East Norfolk	23.5	44.794722	-74.98556	4.8
Norfolk	22.5	44.802220	-74.99055	7.0
Raymondville	20.0	44.833900	-74.98060	3.1
TOTAL				18.0

The LRRP developments have an overall total installed capacity of 18.0 MW and produce an average of 95.18 GWh annually (plant factor of 60.4%). On September 12, 2008, EBH filed a Request for Certification of Incremental Hydropower Generation. With FERC²⁸ On April 16, 2009, FERC approved and certified incremental energy for the LRRP.²⁹

Two USGS gages are located on the Raquette River near the LRRP. The U.S. Geological Survey (USGS) gage 04267500 (Raquette River at South Colton, NY) is located upstream of the LRRP developments. This gage has a contributing drainage area of 937 SQMI and has period of record (POR) daily flows since January 1, 1953. The USGS gage 04268000 (Raquette River at Raymondville, NY) is located just downstream of the LRRP developments. This gage has a contributing drainage area of 1,125 SQMI and has POR daily flows since November 29, 1943.

Historically, USGS gage 04268000 has been used to estimate inflows at the LRRP's developments. The minimum daily flow of 7.0 CFS occurred on October 15, 1951. The maximum daily flow of 13,700 CFS occurred on May 4, 2011. A flow of 756 CFS is exceeded about 90% of the time annually. A flow of 1,735 CFS is exceeded about 50% of the time annually. A flow of 4,136 CFS is exceeded about 10% of the time annually. The 1% exceeded annual flow is 6,418 CFS.

A. Norwood

The Norwood development has a total drainage area of 1,045 sq. mi. with an intervening drainage area of 51 sq. mi. between Norwood and the upstream MRRP's Sugar Island development, and consists of:

- A 188-foot-long by 23-foot-high concrete gravity dam with 1-foot-high wooden flashboards;
- A reservoir with a 350-acre surface area and a 1,900-acre-foot gross storage capacity at normal maximum pool elevation 327.1 feet mean sea level (FTMSL);
- A concrete intake structure with steel trashracks oriented 90 degrees to the direction of flow, a skimmer section, and three motor-operated steel sliding gates;

²⁸ <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=11804226>

²⁹ <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=11991682>



- Two timber flood gates, one 9 feet, 9 inches wide by 12 feet high, and the other 12 feet high by 12 feet wide;
- A concrete log chute with stop log opening 11 feet, 2 inches wide by 4 feet, 6 inches high;
- A concrete and brick powerhouse 60 feet long by 43 feet wide by 34 feet high containing a 3.1-MW generating unit;
- A 3-mile-long, 23-kilovolt (kV) transmission line connecting the Norwood and Norfolk developments, and;
- Appurtenant facilities.

There are no plans for any facility upgrades at the development.

Releases from Norwood pass downstream into the East Norfolk impoundment.

B. East Norfolk

The East Norfolk development has a total drainage area of 1,063 sq. mi. with an intervening drainage area of 18 sq. mi. between East Norfolk and the upstream Norwood development, and consists of:

- A concrete gravity dam with seven hand-operated sluice gates measuring 8 feet wide by 9 feet high protected by steel trashracks oriented 24 degrees to the direction of flow;
- A reservoir with a 135-acre surface area and a 360-acre-foot usable storage capacity at normal maximum pool elevation of 287.9 feet MSL;
- A 4-foot by 4-foot pond drain;
- A concrete intake structure equipped with steel trashracks oriented 90 degrees to the direction of flow, a skimmer section, and an ice chute with a steel sliding gate;
- A 32-foot-wide by 1,408-foot-long oval steel flume;
- A powerhouse containing a single 4.8-MW generating unit;
- A 0.86-mile-long, 23-kV transmission line connecting the East Norfolk and Norfolk developments, and;
- Appurtenant facilities.



Figure 2 - Norwood Dam and Intake to Power Canal

There are no plans for any facility upgrades at the development.



Figure 3 - East Norfolk Impoundment above Dam

Releases from East Norfolk pass downstream into the Norfolk impoundment.

C. Norfolk

The Norfolk development has a total drainage area of 1,066 sq. mi. with an intervening drainage area of 3 sq. mi. between the Norfolk and East Norfolk developments. Norfolk consists of:

- A reservoir with a 10-acre surface area and a 35-acre-foot usable storage capacity at normal maximum pool elevation of 254.9 feet MSL;
- A 20-foot-high concrete dam with 10-inch high flashboards, three 12-foot-wide by 10-foot-high steel headworks gates, and two 9-foot-wide by 9-foot-high sluice gates;
- A 14-foot-diameter, 103-foot-long steel penstock fitted with a motor-operated 14-foot-diameter butterfly valve;
- A 700-foot-long, 14-foot-diameter wood stave pipeline protected by two steel trashracks oriented 90 degrees to the direction of flow, a skimmer section, and a 6-foot wide by 6-foot high ice sluice gate used for flushing ice and debris downstream;
- A 1,275-foot-long power canal;
- A concrete and brick powerhouse measuring 52 feet, 6 inches wide by 50 feet, 7 inches long by 35 feet high containing a 7.0-MW generating unit;
- A short 2.4-kV underground transmission line and a 2.32-mile, 115-kV transmission line connecting the Norfolk and Raymondville developments, and;
- Appurtenant facilities.



Figure 4 - Norfolk Spillway

There are no plans for any facility upgrades at the development.

Releases from Norfolk pass downstream into the Raymondville impoundment.

D. Raymondville

The Raymondville development has a total drainage area of 1,077 SQMI with an intervening drainage area of 11 sq. mi. between the Raymondville and the upstream Norfolk development. Raymondville consists of:

- A 50-acre reservoir and a 315-acre-foot usable storage capacity at normal pool elevation 211.6 feet MSL;
- A 292-foot by 17-foot-high concrete gravity dam having 2.0-foot-high rubber and steel flashboards;
- Two 4-foot by 4-foot pond drains;
- A 48-foot-wide by 447-foot-long concrete power flume having trashracks oriented 90 degrees to the direction of flow, an ice chute, and three steel flume intake gates, each 12 feet wide by 10 feet high;
- A concrete, brick, and steel powerhouse measuring 60 feet wide by 42 feet long by 34 feet high containing a 3.1-MW generating unit; and
- Appurtenant facilities.



Figure 5 - Raymondville Spillway

There are no plans for any facility upgrades at the development.

5. ZONES OF EFFECT (ZOE)s

The LRRP has eleven ZOE's. The Applicant has defined ZOE's at each development from upstream to downstream and numbered them consecutively.

A. Norwood

The Norwood development has two ZOE's:

- ZOE 1 – Impoundment - RM 31 (Unionville Dam) downstream to RM 27 (Norwood Dam).
- ZOE 2 – Downstream - RM 27 (Norwood Dam) downstream to RM 25 (Yaleville Dam).

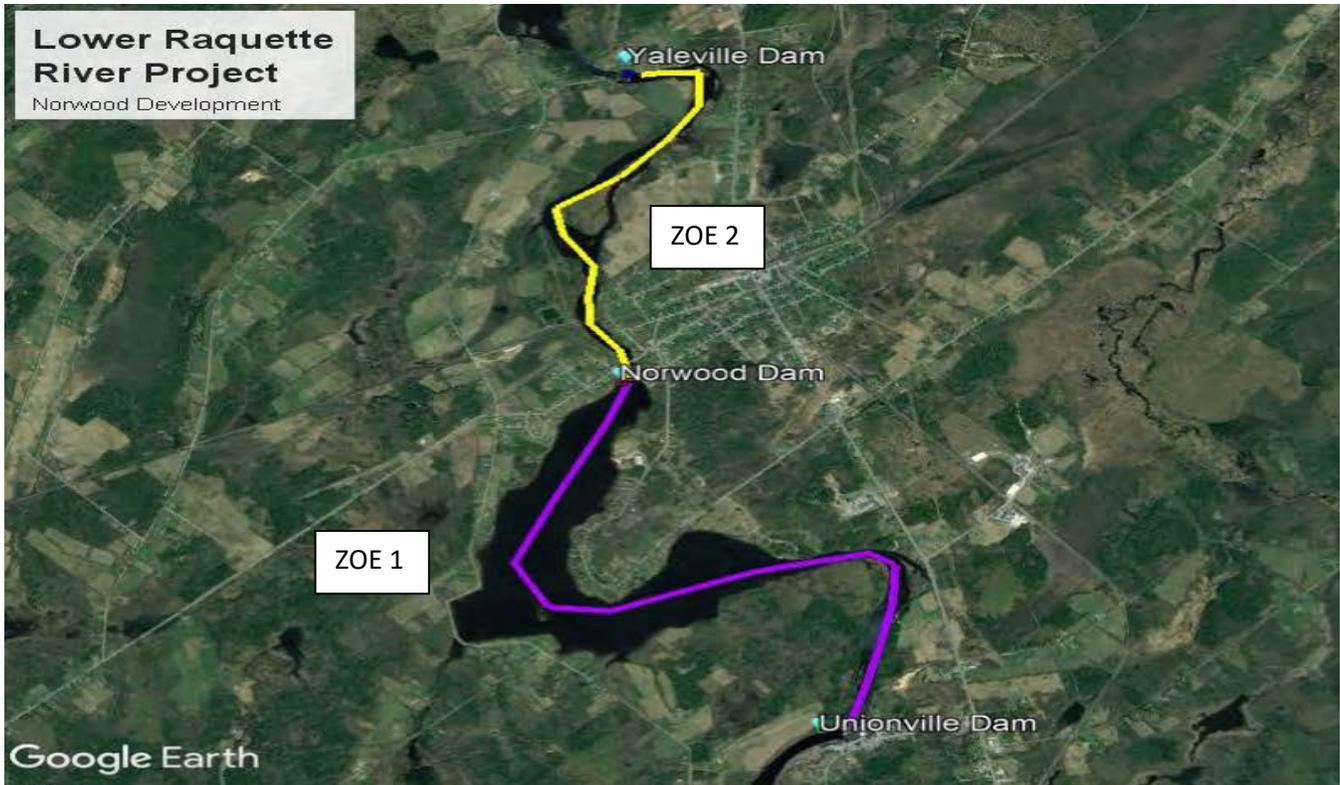


Figure 6 - ZOE 1 & 2

The Norwood development ZOE alternative standards are shown in Tables 2 and 3.

Criterion		Alternative Standards				
		1	2	3	4	Plus
A	Ecological Flow Regimes	X				
B	Water Quality		X			
C	Upstream Fish Passage		X			
D	Downstream Fish Passage		X			
E	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection		X			
G	Cultural and Historic Resources Protection		X			
H	Recreational Resources		X			



Criterion		Alternative Standards				
		1	2	3	4	Plus
A	Ecological Flow Regimes		X			
B	Water Quality		X			
C	Upstream Fish Passage		X			
D	Downstream Fish Passage	X				
E	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection		X			
G	Cultural and Historic Resources Protection		X			
H	Recreational Resources		X			

B. East Norfolk

The East Norfolk development has three ZOE's:

- ZOE 3 – Impoundment - RM 25 (Yaleville Dam) downstream to RM 22.8 (East Norfolk Dam)
- ZOE 4 – Bypass - RM 22.8 (East Norfolk Dam) downstream to RM 22.4 (East Norfolk tailrace).
- ZOE 5 – Downstream - RM 22.4 (East Norfolk tailrace) downstream to RM 22.1 (Norfolk Dam).

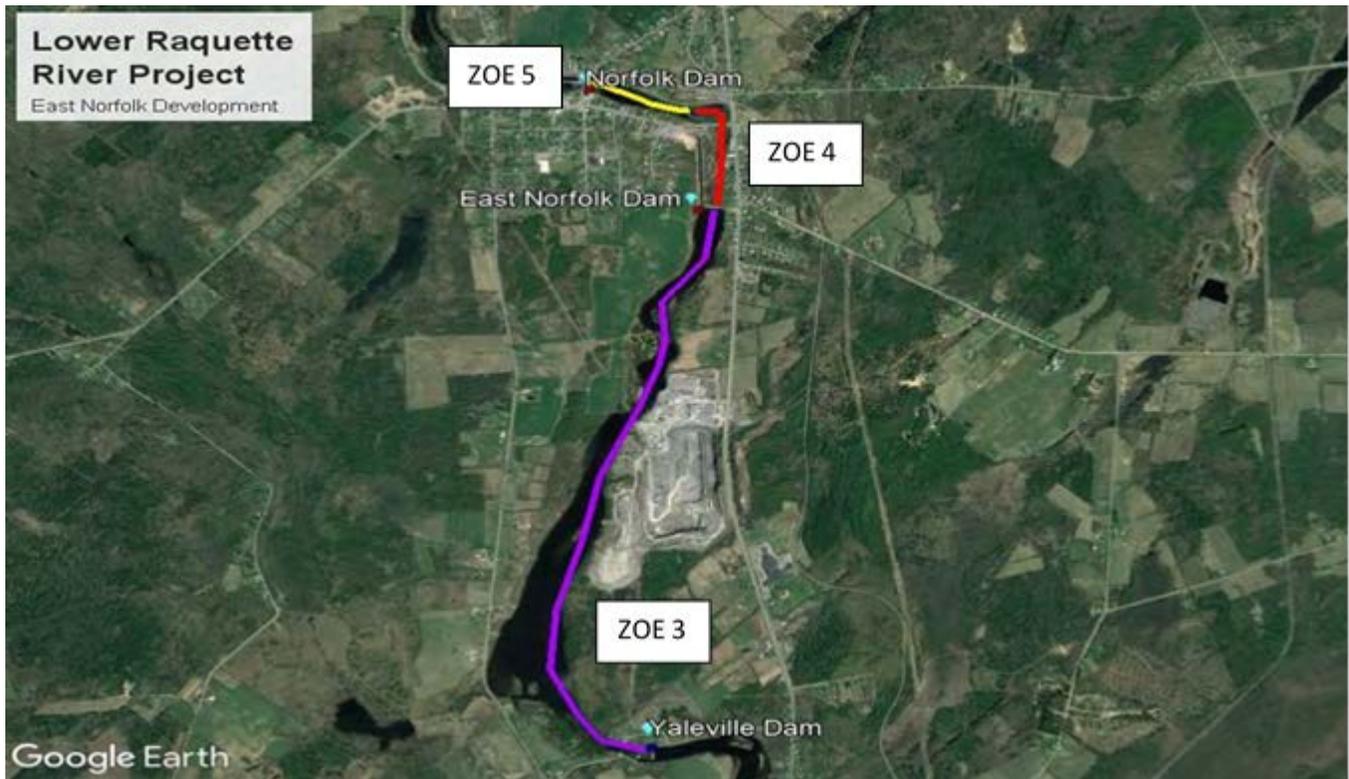


Figure 7 - East Norfolk ZOE's 3, 4, and 5

The East Norfolk development ZOE's alternative standards are shown in Tables 4, 5 and 6.



Table 4 – East Norfolk - ZOE 3 Alternative Standards

Criterion		Alternative Standards				
		1	2	3	4	Plus
A	Ecological Flow Regimes	X				
B	Water Quality		X			
C	Upstream Fish Passage		X			
D	Downstream Fish Passage		X			
E	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection		X			
G	Cultural and Historic Resources Protection		X			
H	Recreational Resources		X			

Table 5 – East Norfolk - ZOE 4 Alternative Standards

Criterion		Alternative Standards				
		1	2	3	4	Plus
A	Ecological Flow Regimes		X			
B	Water Quality		X			
C	Upstream Fish Passage		X			
D	Downstream Fish Passage		X			
E	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection		X			
G	Cultural and Historic Resources Protection		X			
H	Recreational Resources	X				

Table 6 – East Norfolk - ZOE 5 Alternative Standards

Criterion		Alternative Standards				
		1	2	3	4	Plus
A	Ecological Flow Regimes	X				
B	Water Quality		X			
C	Upstream Fish Passage		X			
D	Downstream Fish Passage	X				
E	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection		X			
G	Cultural and Historic Resources Protection		X			
H	Recreational Resources		X			



C. Norfolk

The Norfolk development has three ZOE's:

- ZOE 6 – Impoundment - RM 22.4 downstream to RM 22.1 (Norfolk Dam).
- ZOE 7 – Bypass - RM 22.1 (Norfolk Dam) downstream to RM 21.8 (Norfolk tailrace).
- ZOE 8 – Downstream - RM 21.8 (Norfolk tailrace) downstream to RM 19 (Raymondville Dam).

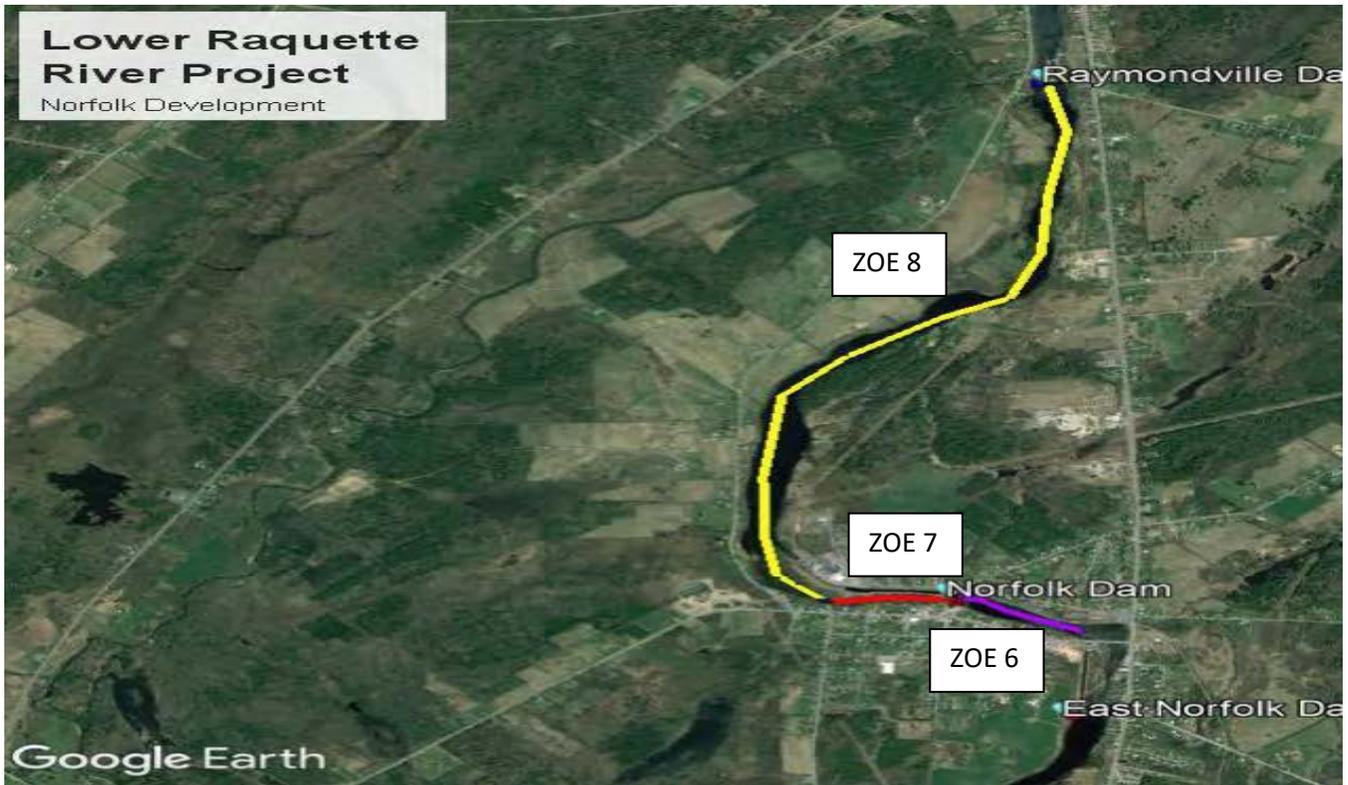


Figure 8 - Norfolk ZOE's 6, 7, and 8

The Norfolk development ZOE's alternative standards are shown in Tables 7, 8 and 9.

Table 7 – Norfolk - ZOE 6 Alternative Standards						
Criterion		Alternative Standards				
		1	2	3	4	Plus
A	Ecological Flow Regimes	X				
B	Water Quality		X			
C	Upstream Fish Passage		X			
D	Downstream Fish Passage		X			
E	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection		X			
G	Cultural and Historic Resources Protection		X			
H	Recreational Resources		X			



Table 8 – Norfolk - ZOE 7 Alternative Standards

Criterion		Alternative Standards				
		1	2	3	4	Plus
A	Ecological Flow Regimes		X			
B	Water Quality		X			
C	Upstream Fish Passage		X			
D	Downstream Fish Passage		X			
E	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection		X			
G	Cultural and Historic Resources Protection		X			
H	Recreational Resources	X				

Table 9 – Norfolk - ZOE 8 Alternative Standards

Criterion		Alternative Standards				
		1	2	3	4	Plus
A	Ecological Flow Regimes	X				
B	Water Quality		X			
C	Upstream Fish Passage		X			
D	Downstream Fish Passage	X				
E	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection		X			
G	Cultural and Historic Resources Protection		X			
H	Recreational Resources		X			

D. Raymondville

The Raymondville development has three ZOE's:

- ZOE 9 – Impoundment - RM 21.8 (Norfolk tailrace) downstream to RM 19 (Raymondville Dam)
- ZOE 10 – Bypass - RM 19 (Raymondville Dam) to RM 18.9 (Raymondville tailrace).
- ZOE 11 – Downstream - RM 18.9 (Raymondville tailrace) to RM 0 (Confluence with St. Lawrence River).

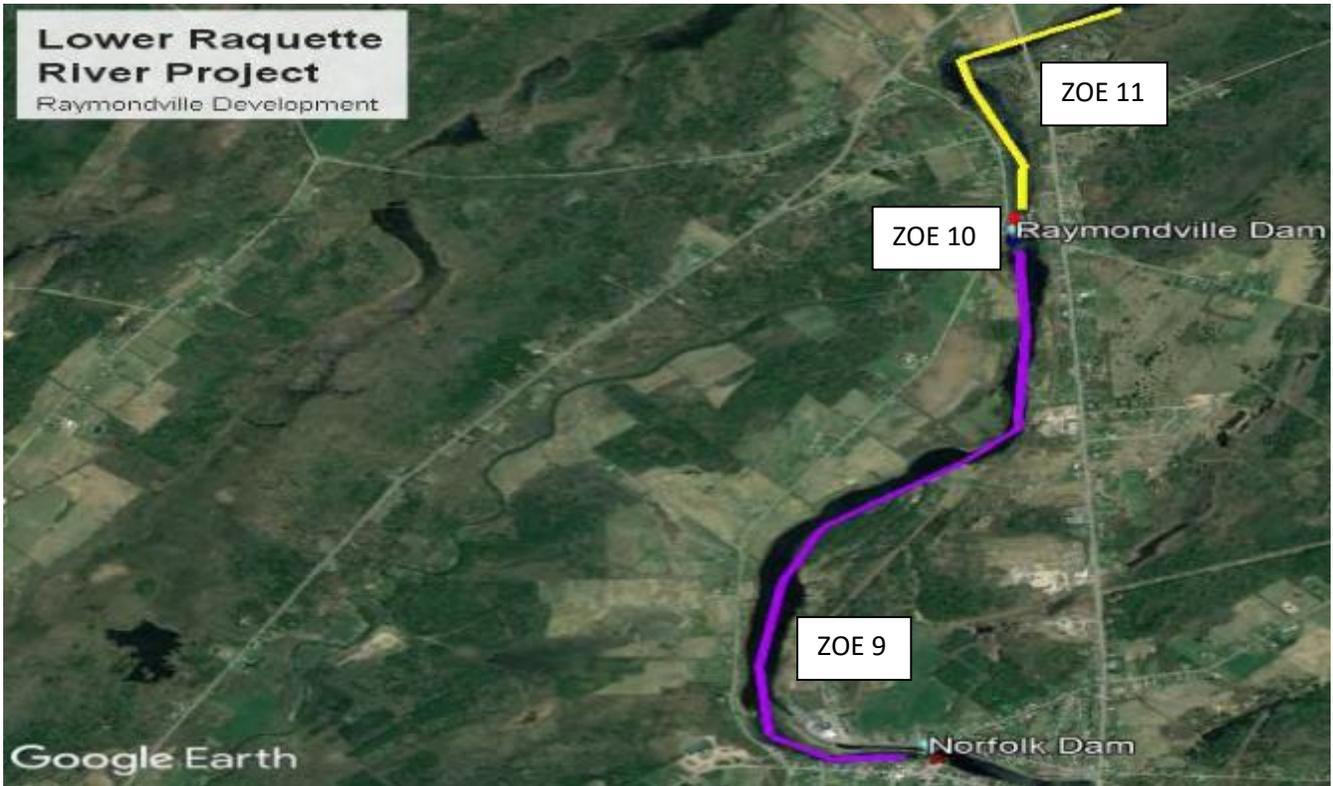


Figure 9 - Raymondville ZOEs 9, 10, and 11

The Raymondville development ZOEs alternative standards are shown in Tables 10, 11 and 12.

Table 10 – Raymondville - ZOE 9 Alternative Standards						
Criterion		Alternative Standards				
		1	2	3	4	Plus
A	Ecological Flow Regimes	X				
B	Water Quality		X			
C	Upstream Fish Passage		X			
D	Downstream Fish Passage		X			
E	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection		X			
G	Cultural and Historic Resources Protection		X			
H	Recreational Resources		X			



Table 11 – Raymondville - ZOE 10 Alternative Standards						
Criterion		Alternative Standards				
		1	2	3	4	Plus
A	Ecological Flow Regimes	X				
B	Water Quality		X			
C	Upstream Fish Passage		X			
D	Downstream Fish Passage		X			
E	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection		X			
G	Cultural and Historic Resources Protection		X			
H	Recreational Resources		X			

Table 12 – Raymondville - ZOE 11 Alternative Standards						
Criterion		Alternative Standards				
		1	2	3	4	Plus
A	Ecological Flow Regimes	X				
B	Water Quality		X			
C	Upstream Fish Passage		X			
D	Downstream Fish Passage		X			
E	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection		X			
G	Cultural and Historic Resources Protection		X			
H	Recreational Resources		X			



6. LIHI RE-CERTIFICATION PROCESS

On November 12, 2018, LIHI sent a reminder letter to EBH stating that LRRP's current LIHI certification would expire on July 9, 2019. EBH submitted a LIHI application for LRRP recertification on June 17, 2019. On July 9, 2019, to allow sufficient time for the recertification process to be completed, LIHI extended the certification term of the LRRP to November 30, 2019.

The Stage I recertification review was completed July 2, 2019. Given the review was processed under the new, Second Edition LIHI Certification Handbook, the need for a Stage II review is necessary. The Stage I review deemed it unnecessary to submit a new revised application, but found supplemental information was needed. However, EBH resubmitted a revised LIHI application for recertification on September 3, 2019. LIHI assigned Mr. Gary Franc to perform the Stage II recertification review.

A. Comment Letters

On August 13, 2019, LIHI provided notice on their email list that the public comment period for the application has been opened. Comments could be submitted until 5 pm Eastern time on October 12, 2019. A comment letter was received by Norwood Lakefront Owners Association (see Appendix B), and those comments are addressed in applicable criterion sections below.

B. Agency Correspondence

On August 13, 2019, LIHI³⁰ emailed contacts³¹ listed in the Project application as knowledgeable about the Project stating, "...You may have already received the notice below if you are on the Low Impact Hydropower Institute (<https://lowimpacthydro.org>) email list. However, you were also identified as an agency or stakeholder contact on the LIHI recertification applications recently submitted by Erie Boulevard Hydropower (Brookfield Renewable Energy Group) for the Lower Raquette and Middle Raquette Hydroelectric Projects located on the Raquette River. The application reviewer, Gary Franc (copied here), may be in contact with you if he has questions about the projects or wishes to clarify any aspects of the LIHI applications. You may also provide comments directly to LIHI. More information about the projects and their applications can be found in the link <https://lowimpacthydro.org/wp-content/uploads/2019/04/Lower-Raquette-LIHI-Application-Final.pdf>."

The review determined that no other outreach to agencies or stakeholders was warranted.

7. RE-CERTIFICATION REVIEW

This section contains my Stage II recertification review of the LRRP with regard to LIHI's Certification criteria. As part of my review, I conducted a FERC e-library search to verify claims in the certification application. My review concentrated on the period from July 9, 2014, the date of issuance of the current LIHI certification, through July of 2019, for FERC docket number P-2330.

³⁰ Maryalice Fischer – LIHI Certification Program Director - mfischer@lowimpacthydro.org - 603-664-5097 office - 603-931-9119 cell

³¹ Jessica Hart – Jessica.Hart@dec.ny.gov; Nicholas Conrad - Nick.Conrad@dec.ny.gov; Robyn Niver - Robyn.Niver@fws.gov; Steve Patch - Stephen.Patch@fws.gov; Michael Lynch - Michael.Lynch@parks.ny.gov



A. LIHI Criterion-Flows

The goal of this criterion is to support habitat and other conditions that are suitable for healthy fish and wildlife resources in riverine reaches that are affected by the facility's operation.

The application states that the LRRP satisfies the LIHI flows criterion in all impoundments ZOE's (1, 3, 6 and 9) by meeting alternative standard A-1. The LIHI flows criterion in all bypass ZOE's (4, 7 and 10) are satisfied by meeting alternative standard A-2. The LIHI flows criterion in downstream ZOE's 5 and 8 are satisfied by meeting alternative standard A-1 while the LIHI flows criterion in downstream ZOE's 2 and 11 are satisfied by meeting alternative standard A-2.

I. Impoundment Fluctuation

From 2002 to about 2007, as allowed in its 2002 FERC License, the LRRP developments were operated in a pulsing mode. The normal reservoir fluctuation was limited to no more than 0.5 feet at the Norwood, East Norfolk, and Raymondville developments and no more than 1.0 foot at the Norfolk development. As subsequently modified in the LRRAL, the operation of all the LRRP's developments was changed from a pulsing mode to a ROR mode. On March 24, 2010, EBH provided FERC with the final revised SWLMP³² which was approved on November 23, 2010³³.

The Project operates in an instantaneous ROR operation mode subject to certain facility-specific hydraulic conditions that result in local pond level oscillations. ROR operations include a normal impoundment level setpoint at 0.2 feet below each dam crest or below top of flashboards when in place. However, there are localized hydraulic conditions at the water conveyance structures that can result in minor pond level oscillations near the intake structures. These conditions can create temporary and false appearances of impoundment fluctuations where none exist and while run-of-river operations are being maintained. Therefore, a compliance bandwidth allows measured impoundment levels to decrease as much as 0.5 feet below dam crest or top of flashboards before impoundment fluctuations are considered operational deviations and notification to NYDEC and FERC is required. This ROR mode maintains reservoir levels at or near the top of the dam crest or top of flashboards. Since minimum flows at the developments are passed over weirs a slightly higher minimum flow and/or fish movement flow is provided. EBH measures the impoundment levels at all the LRRP developments with remote gauging equipment that records headpond elevations every 15 minutes. An hourly average is recorded to the nearest 0.1 foot.

There were two periods of extended drawdowns at the Norwood impoundment in the fall of 2017 and again in 2018 and 2019 during the construction season. The drawdown was required in response to a FERC dam safety inspection. Based on publicly available information from the Federal Energy Regulatory Commission (FERC) under which the Project is licensed to operate, in September 2017 a 12-foot drawdown conducted in response to a July 2017 FERC dam safety inspection that identified potential concrete problems with the dam. FERC requested the drawdown to allow photographing the dam face for damage assessment. The drawdown was planned, and agencies properly notified in advance. The drawdown lasted about 2 weeks for purposes of initial investigation, photographing of the dam, and short-term repairs. The drawdown was conducted in consultation with federal and state resource agencies in order to protect Blanding's turtle and fish from possible stranding. Further spillway investigation and dam rehabilitation was then required under FERC's strict dam safety procedures and approvals, and again under extended

³² <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=12301362>

³³ <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=12493376>



drawdown conditions. Work began in the fall of 2018, stopped during the winter and spring high flow season, and resumed in June 2019.

The Norwood Lakefront Owners Association (NLOA) commented that the extended drawdowns of the reservoir that have exposed the littoral edge and may have: impacted mollusks and fish, degraded the shoreline habitat, and increased shoreline erosion from runoff. The comments questioned whether the applicant has reported deviations from reservoir levels to LIHI and noted that these deviations were not documented in the applicant's recertification application. The comments also expressed concern over a lack of timely communication and information about remediation from these drawdowns.

EBH stated to LIHI staff that they met with the Norwood Lake Association (a different organization than NLOA) in person several times and with the Village Board at least twice to discuss the project and answer questions/concerns. EBH also published notice in North Country Now warning of the lowered water level in 2018³⁴, sent a mailer door-to-door to adjacent landowners and town offices,³⁵ and filed periodic construction reports with FERC. Upon completion of the dam rehabilitation work EBH received FERC approval on July 30, 2019 to reinstall the dam flashboards and refill the reservoir to its normal elevation. The flashboards were re-installed, and the impoundment was brought back to its normal summer level. EBH also kept the flashboards in place later than normal to make up for some of the lost boating season in the summer,³⁶ and contributed \$10,000 in funding to the Norwood Lake Association in 2018 for restocking of the reservoir with fish.³⁷

II. Minimum Flow

Minimum flows are based on a Delphi exercise conducted in the summer of 1996 for the LRRP bypass reaches. According to the FERC Environmental Assessment (EA)³⁸, the flow volumes and periodicity at each development were intended to support multiple resource agency management objectives that prioritized restoration of walleye spawning and incubation as the top priority, fish movement, restoration of benthic invertebrate and forage fish production, riparian and wetland production, aesthetics, safety, and water quality. In reaches where little improvement could be made the flow volumes were kept minimal. In reaches where significant benefits were expected, larger volumes and/or longer periods of seasonal flows were established. The reaches were each characterized and evaluated for aquatic habitat including metrics such as wetted area, water depth, velocity, substrate, and cover. Site-specific walleye spawning studies conducted as part of relicensing also informed the current minimum flows incorporated into the Settlement Agreement³⁹ which stated that the Delphi study goal was *"to develop a comprehensive, biologically-based flow recommendation that incorporates and balances all relevant flow-related environmental values for each bypass each"*.

Minimum instream flows are not required due to de minimis or backwatered bypass reaches at Norwood and Raymondville although fish bypass flows are required, and Raymondville has a base flow requirement.

³⁴ <https://northcountrynow.com/business/brookfield-warns-anyone-using-norwood-lake-recreation-use-caution-0249019>

³⁵ <https://northcountrynow.com/news/brookfield-outlines-schedule-norwood-lake-work-warns-changing-water-conditions-0258748>; and <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=15241724>

³⁶ <https://northcountrynow.com/news/brookfield-renewable-power-will-keep-water-norwood-lake-ater-usual-0265301>

³⁷ <https://www.northcountrynow.com/hometown-photos/norwood-photos/donation-norwood-lake-association>

³⁸ <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=9033977>

³⁹ <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=8157082>



The LRRP developments operate in a ROR mode while supplying minimum flows⁴⁰ as follows:

- From Norwood, a continuous fish conveyance flow of 20 CFS is released for downstream fish passage;
- From East Norfolk, a year-round release of 75 CFS is maintained through the stop log section near the left shore and intake. The 75 CFS can vary from 65 CFS to 85 CFS;
- From Norfolk, a year-round release of 75 CFS is maintained below the confluence of the trash sluice channel and the bypass reach (main channel of the Raquette River). A release of 55 CFS is maintained from the stop log section of the dam near the right shore and head gates at the upstream end of the bypass reach. The 55 CFS can vary from 52.5 CFS to 57.5 CFS. A second release of 20 CFS is maintained in the trash sluice channel which enters the bypass reach at approximately the halfway point. Again, the 20 CFS can vary from 19 CFS to 21 CFS;
- From Raymondville, a fish conveyance flow of 20 CFS is released for downstream fish passage. When the development is not operating, all flows are spilled from the dam.

III. Base Flow

The LRRAL requires EBH to maintain a base flow at the area known as the cemetery riffle, located approximately 4 miles downstream of the Raymondville Development. The Settlement Agreement states that the required base flow from Raymondville was intended to provide more stable flows in the free-flowing lower river, and to ensure that most of the riffle habitat is adequately wetted at all times. The FERC EA notes that diversity and productivity would therefore increase, and the river would become more attractive to resident fish from the St. Lawrence River and allow them to access the lower 20 miles of the Raquette River. To ensure the base flow is being met at the cemetery riffle, a timer system has been installed and calibrated into the LRRP control scheme. The timer system is designed to maintain downstream releases when transitioning from turbine flow to spillway flow and vice versa.

During wet river conditions (WRC) and normal river conditions (NRC), a base flow of 560 CFS is required below Raymondville. During dry river conditions (DRC), the base flow requirement drops to 290 CFS. During critical drought river conditions (CRC), the lower base flow requirement is set to the daily average flow at the upstream USGS gage at Piercefield, NY. EBH must also consult with NYSDEC staff to determine any appropriate adjustments.

The Raquette River flow condition is determined using the total daily average outflow from the upstream MRRP Colton development, in conjunction with the URRP Carry Falls development pond elevation and the Piercefield gage flow.

A WRC exists when, *“The total daily average outflow from Colton is greater than or equal to 1600 CFS and the elevation within the Carry Falls Reservoir is greater than, or equal to 1357 FTMSL.”* The timer system for the LRRP is not used under this condition.

An NRC exists when, *“The total daily average outflow from Colton is between 650 CFS and 1600 CFS, and the elevation within Carry Falls Reservoir is greater than or equal to 1357 FTMSL.”* The timer system may be used to ensure provision of the 560 CFS.

⁴⁰ All minimum flows actual release at any given time may be slightly above or below the required value. The degree of variation is a function of head pond impoundment fluctuation. EBH must determine the appropriate gate settings for the provision of minimum flows at each development based upon the midpoint of the normal impoundment fluctuation of each development. For example, if the normal impoundment fluctuation is 1.0 foot, and the instream flow is 45 CFS, the gate setting to provide 45 CFS shall be based upon a drawdown of 0.5 feet.



A DRC exists when, “*The total daily average outflow from Colton is less than 650 CFS and the elevation within the Carry Falls Reservoir is greater than or equal to 1357 FTMSL.*” The timer system is used to ensure provision of the 290 CFS. A DRC is experienced less than 5 percent of the time annually.

Once the Carry Falls reservoir elevation drops below 1357 FTMSL, EBH starts monitoring the daily average flow at the USGS gage at Piercefield to determine if a CRC exists. A CRC exists when, “*The daily average flow at the Piercefield gage is less than 250 CFS⁴¹ and the Carry Falls Reservoir elevation is less than 1357 FTMSL.*” During a CRC, EBH maintains a base flow downstream of Raymondville equal to the daily average flow of the Piercefield gage. Additionally, EBH notifies and consults with NYSDEC staff to determine if modifications to the base flow and/or the Carry Falls drawdown limit are warranted. A CRC is experienced less than 1 percent of the time annually.

Operating constraints may be curtailed or suspended if required by operating emergencies beyond the control of EBH, including security, and for short periods upon mutual agreement between EBH and NYSDEC. If the limitations are so modified, EBH notifies FERC as soon as possible, but no later than ten business days after each such incident.

For construction and maintenance activities that require lowering the level of an impoundment below the normal operating limits, EBH’s operating procedure (HOP 202⁴²) requires notification with NYSDEC and compliance with drawdown rates specified in the WQC.

IV. Criterion-Flows Summary

In 2015, under the current LIHI certification, eight base flow deviations occurred at the Raymondville facility. All occurred during a one-month period between mid-August and mid-September. All but one lasted about one hour or less, and no environmental impacts were noted. Several were due to conditions beyond operator control (station trips, transmission trip, or river debris). In all cases, EBH notified NYSDEC and FERC of the deviations. Two incidents were considered by FERC to be violations of license article 402 and the associated stream flow monitoring plan, both being due to operator error.

In 2016 there were three base flow deviations at Raymondville. No deviations occurred in 2017, in 2018 there was one and 2019 to date there were two deviations reported. In all cases, EBH notified NYSDEC and FERC of the deviations which were beyond operator control and FERC did not consider any to be license violations.

EBH had informed FERC that a main cause of these deviations was that the USGS gage at Raymondville does not accurately represent flows at the hydrologically sensitive cemetery riffle river location under all river flow conditions. The USFWS concurred with this observation and recommended a new USGS gage near the cemetery riffle as one possible solution.

FERC required EBH to consult with resource agencies to conduct a flow routing study to determine the correlation between the USGS gage readings at Raymondville and the flow measured at the downstream cemetery riffle river location. The study was completed in 2016, accepted by USFWS and NYSDEC, and resulted in EBH developing a timer system to help maintain base flow within the cemetery riffle. The routing study was submitted to LIHI and staff accepted the study in place of the DRP.

⁴¹ Daily average flow at the Piercefield gage is approximately 85 percent that of daily average flows measured at Raymondville.

⁴² HOP 202 is a separate operating procedure that EBH has developed for use at all of the hydro sites.



EBH reports in its 2019 LIHI annual compliance submittal that they had contacted USGS about possibly relocating the stream gage to a point farther downstream that would more accurately represent flows in the reach, and that they are continuing to coordinate with agencies on alternatives for stream flow data collection, and that they are operating in compliance with the SWLMP.

I recommend that EBH continue to provide annual reports to LIHI documenting all operational deviations that occurred throughout the year whether unintentional or planned. The report will be due at the same time as the annual compliance statement. In addition, EBH should provide status updates on any agreements related to the USGS gage relocation and/or other alternatives implemented for stream flow monitoring at Raymondville.

Based on the information provided, the LRRP complies with resource agency conditions and recommendations issued related to flow conditions and impoundment fluctuation, and therefore generally continues to satisfy the flows criterion. The recommended conditions will allow LIHI to monitor deviations and encourage EBH to reduce their number if needed.

B. LIHI Criterion-Water Quality

The goal of this criterion is to ensure water quality is protected in water bodies directly affected by facility operations, including downstream reaches, bypassed reaches, and impoundments above dams and diversions.

The Applicant states that the LRRP satisfies the LIHI water quality criterion in all eleven ZOE's by meeting alternative standard B-2.

The NYSDEC classifies the project area based on their designated best use. Water classifications for the project include:

- Class B - Coldwater fishery - Best use is primary contact recreation and other uses except as a source of water supply for drinking and culinary or food processing purposes;
- Class C (T) - Coldwater fishery that supports trout - Best use is fishing and all other uses except as a source of water supply for drinking, culinary or food processing purposes and primary contact recreation, and;
- Class D - Warm water fishery - Best use is secondary contact recreation.

The 2016 State of New York 303(d) List of Impaired Waters⁴³ does not identify the waters in the LRRP area as being impaired. The NYSDEC issued the original WQC on June 11, 1998 and issued a revised WQC on October 13, 2006⁴⁴.

The revised WQC addresses EBH's July 3, 2006 application to amend the license to increase the authorized capacity and change operation at all four developments from the existing store and release mode of operation to a ROR mode of operation.

Since the WQC was issued more than ten years ago, EBH requested the NYSDEC to reconfirm the legitimacy of the WQC in a letter or email statement. In an email dated August 14, 2019, the NYSDEC

⁴³ https://www.dec.ny.gov/docs/water_pdf/303dListfinal2016.pdf

⁴⁴ October 13, 2006 WQC - <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=11162942>



stated that the 2006 WQC is still valid with regard to the operation of the LRRP (See Appendix A, page A-177).

There are no other agency recommendations or compliance activities related to water quality.

The NLOA comment letter noted concerns about large quantities of foam on the river in the Norwood impoundment which occurred in April 2019, and that that Brookfield was informed about it, but no response was received. EBH indicated to LIHI staff that they consulted with NYSDEC who reported that it was naturally occurring. Invasive milfoil has also been observed in the reservoir and the comment letter noted that Brookfield is aware of the issue but has not made any effort to address it.

The appearance of foam on a river or reservoir is typically due to the natural die-off of aquatic plants and their natural oils that float to the surface.⁴⁵ In some cases foam can be caused by human factors, but these are beyond the control of EBH. Eurasian Watermilfoil is present throughout the Raquette River from Carry Falls Reservoir downstream to and including the Lower Raquette River. Milfoil is typically carried via recreational boats, canoes, and kayaks from one waterbody to another. Similar to foam, the Applicant has no control over the spread of milfoil throughout the region. However, the extended drawdowns assisted in killing off many patches of milfoil around the impoundment and provided an opportunity to actively remove milfoil under the lowered water conditions.⁴⁶ EBH indicated to LIHI staff that they meet annually with Norwood Lake Association to discuss milfoil issues. They have also installed invasive species signage at all boat launches and voluntarily built and installed invasive species disposal stations in accordance with NYSDEC design at each Raquette River boat launch. Based on these actions, EBH has made sufficient efforts in support of milfoil control.

Throughout the prior LIHI Certification period, no new areas of concern have occurred. Given the NYSDEC confirmation and lack of impaired waters, the Project does not appear to adversely impact water quality, therefore, the LRRP continues to satisfy the water quality criterion.

C. LIHI Criterion-Upstream Fish Passage

The goal of this criterion is to ensure safe, timely and effective upstream passage of migratory fish so that the migratory species can successfully complete their life cycles and maintain healthy, sustainable fish and wildlife resources in areas affected by the Project's facilities.

The Applicant states that the LRRP satisfies the LIHI water quality criterion in all eleven ZOE's by meeting alternative standard C-2.

No upstream fish passage requirements were part of the 2002 FERC license. However, Article 403 of the license reserves the FERC's authority to require EBH to construct, operate, and maintain fishways as the USDOJ may prescribe.

As part of the 2006 Amended License, EBH was required to install upstream eel passage at all four developments of the LRRP and at its Yalville Project (P-9222). On March 3, 2008, FERC issued approval

⁴⁵ <https://www.rappflow.org/resources/faq.html>

⁴⁶ <https://northcountrynow.com/news/brookfield-renewables-drains-norwood-lake-repair-dam-remove-milfoil-0217693>



of the Eel Passage Plan (EPP)⁴⁷ and implementation schedule, filed by EBH on December 17, 2007⁴⁸ and upstream eel passage were subsequently installed at these projects.

The EPP was developed through consultation with the USFWS and the NYSDEC. The eel passage facilities consist of 18-inch-wide aluminum flumes with solid bottoms, installed with a maximum slope of 45 degrees, one-foot-wide aluminum troughs to convey attraction flows, pumps, and siphons to provide attraction and ladder flows, removable cover plates at East Norfolk, Norfolk, and Raymondville and substrate liners in the flumes. Siphon pipes are used to supply attraction flows of 120 gallons per minute (GPM) and pumps provide 20 GPM into the ladders. The ladders are hinged in the lower sections to prevent damage during high flows, ice and from other debris impacts.



Figure 10 - Upstream Eel Fishway at Norwood

Eel passage facilities at the Raymondville, Norfolk and East Norfolk developments were completed prior to the December 31, 2008 deadline and for the Norwood development, prior to the December 31, 2009 deadline (See Figure 12).

During the prior LIHI recertification, on June 13, 2011, EBH notified FERC that the eel ladders at Raymondville and East Norfolk were significantly damaged and complete sections were lost due to unusually high flows in April and May of 2011. Eel passage remained inoperable until August 9, 2013 when repairs were completed.

Throughout the prior LIHI Certification period, the LRRP has operated to meet concerns for upstream passage of catadromous fish. No new issues have arisen. Therefore, the LRRP continues to satisfy the upstream fish passage criterion.

D. LIHI Criterion-Downstream Fish Passage

The goal of this criterion is to ensure safe, timely and effective downstream passage of migratory fish and for riverine fish such that the facility minimizes loss of fish from reservoirs and upstream river reaches affected by facility operations. All migratory species can successfully complete their life cycles and maintain healthy, sustainable populations in areas affected by the facility.

The application states that the LRRP satisfies the LIHI downstream fish passage criterion in all impoundment and bypass ZOE (1, 3, 4, 6, 7, 9 and 10) by meeting alternative standard D-2, and satisfies the LIHI downstream fish passage criterion in all downstream ZOE (2, 5, 8 and 11) by meeting alternative standard D-1.

The LRRP area is composed of a diverse group of game fish and pan fish. Currently, NYSDEC manages the Raquette River in the section of the LRRP as a mixed cool water - warm water fisheries resource. The

⁴⁷ <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=11600045>

⁴⁸ <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=11566062>



most abundant game fish and pan fish are walleye, smallmouth bass, northern pike, yellow perch, rock bass, pumpkinseed, and brown bullhead. In 1989 a fisheries investigation of the bypassed reaches of the LRRP developments resulted in a catch of 145 fish representing six species. Pumpkinseed and log perch constituted 82 percent of the catch. The dominant species structure has not changed since 1933.

As defined in the 2002 FERC license, EBH provides for safe downstream fish movement and protection at all of the LRRP developments coincident with the release of minimum flows and modifications to the structures and streambed in order to make the flows more fish friendly⁴⁹.

The LRRAL did not require a fish passage or effectiveness testing plan. One-inch trashracks were expected to reduce entrainment of adult fish. Also, the downstream passage facilities were assumed adequate for passing of American eel.

FERC determined that the average approach velocities, as measured 1 foot in front of the trashracks, were generally less than 2 feet per second (FPS), and the installation of the 1-inch trashracks would not cause any adverse effects on fisheries resources if EBH routinely removed debris from the trashracks.

The 2006 LRRAL accelerated the installation of 1-inch trashracks at the Norwood development to 2007. In addition, EBH provides a fish conveyance flow of 20 CFS via the stop log structure adjacent to the dam. EBH reduced the roughness of the spillway face, implemented measures to reduce dispersion of the minimum release over the spillway face, and ensured the release structure empties into a pool of adequate depth.

New 1-inch clear spacing physical barriers installed immediately above their existing trashrack structure were completed at Raymondville in 2002 and at Norfolk in 2004. New 1-inch trashrack were installed at East Norfolk in 2006⁵⁰ and at Norwood in 2007⁵¹ ahead of schedule.

At the East Norfolk development, the 1-inch clear spacing physical barrier was installed at the location of the existing trashrack structure. EBH also constructed a plunge pool below the passage structure.

At the Norfolk development, the 1-inch clear spacing physical barrier was installed at the location of the existing trashrack structure. EBH also modified the trash sluice flume to reduce flow velocity and constructed adequate plunge pools and conveyance routes in the rip-rap basin and obstructed channel between the trash sluice flume and bypass reach.

At the Raymondville development, the 1-inch clear spacing physical barrier was installed at the location of the existing trashrack structure. In addition, EBH provides a fish conveyance flow of 20 CFS via the trash sluice structure and/or via low level sluice gate. EBH also modified the pool adjacent to the powerhouse to ensure adequate dimensions for the release structure.

There are no barriers to downstream fish passage in the downstream ZOE's. Once fish cross over the dams into the bypass reaches, the fish do not have any further impediments to passage downstream.

Downstream fish passage may be curtailed or suspended if required by operating emergencies beyond the control of EBH, including security, and for short periods upon mutual agreement between EBH and the

⁴⁹ Fish-friendly flow is a flow that is released in a manner that is not expected to injure fish through contact with hard or rough surfaces.

⁵⁰ <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=11315929>

⁵¹ <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=11657604>



NYSDEC. If the limitations are so modified, EBH will notify the FERC as soon as possible, but no later than ten business days after each such incident.

Throughout the prior LIHI Certification period, the Project has provided protective downstream passage and no new issues have arisen; therefore, the LRRP continues to satisfy the downstream fish passage and protection criterion.

E. LIHI Criterion-Shoreline and Watershed Protection

The shoreline and watershed protection criterion is designed to ensure that sufficient action has been taken to protect, mitigate and enhance environmental conditions on shoreline and watershed lands associated with the facility.

The Applicant states the LIHI shoreline and watershed protection criterion in all eleven ZOE's is satisfied by meeting alternative standard E-1.

The LRRAL did not require the development of a Shoreline Management Plan. The overbank areas of the Lower Raquette River near the LRRP development dams consist of rural housing and industrial uses. The overbank areas of the Lower Raquette River located between the LRRP developments consist of agricultural and natural lands of non-significant ecological value⁵².

During the current LIHI certification period, no new issues have arisen related to shoreline and watershed protection. Therefore, the LRRP continues to satisfy the shoreline and watershed protection criterion.

F. LIHI Criterion-Threatened and Endangered Species

The threatened and endangered species protection criterion is designed to ensure that the facility does not negatively impact state or federally-listed threatened or endangered species.

The Applicant states the LIHI Threatened and Endangered Species criterion in all eleven ZOE's is satisfied by meeting alternative standard F-2.

A USFWS Information for Planning and Conservation Trust Resources Report (IPCTRR) was generated April 4, 2019 for the LRRP area (See Appendix A, page A- 1). The report identifies one threatened species, the Northern long-eared bat (*Myotis septentrionalis*), and 7 migratory birds protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

⁵²National Land Cover Database 2016 - <https://www.mrlc.gov/tools>



Birds listed as Birds of Conservation Concern include:

- American Golden-plover (*Pluvialis dominica*);
- Bald Eagle (*Haliaeetus leucocephalus*);
- Bobolink (*Dolichonyx oryzivorus*);
- Eastern Whip-poor-will (*Antrostomus vociferous*);
- Lesser Yellowlegs (*Tringa flavipes*);
- Semipalmated Sandpiper (*Calidris pusilla*), and;
- Wood Thrush (*Hylocichla mustelina*).

The only year-round bird found in the LRRP area is the bald eagle. All the other 6 species are found exclusively during breeding or wintering season. The bald eagle is a state-endangered species listed under the protection of the New York Endangered Species Law⁵³. The Northern long-eared bat and upland sandpiper are also listed as state-threatened.

The threatened bald eagle is known to pass within the boundaries of the LRRP only as a transient species. On November 7, 2006 (See Appendix A, page A-10), EBH provided correspondence history with USFWS. Only one bald eagle nest was observed within 8 miles of the Raymondville development and no critical habitat for this species was identified by the USFWS in the vicinity of the LRRP.

On July 28, 2006 (See Appendix A, page A-12, portions redacted), EBH provided additional correspondence with NYSDEC regarding additional threatened and endangered species. The NYSDEC identified the following species in the vicinity of the LRRP:

- Yellow Lampmussel;
- Lake Sturgeon; and;
- Downy Phlox (a perennial plant).

A mussel survey was completed for the LRRP in July 2000, and the presence of the yellow lampmussel species (not listed but considered a species of concern/interest by USFWS and NYSDEC) in the vicinity of the Norwood and Raymondville developments was documented. The populations were determined to be healthy, and the potential impact associated with the operation of the LRRP facilities was associated with the potential for water level variations. The switch from a store and pulse mode of operation to a ROR operation reduces water level variations at each LRRP facility. In their 2001 EA, FERC staff stated there was no need to further investigate potential impacts to this species.

In 2006, the NYSDEC stated lake sturgeon (a state-threatened species) had been caught in the Raquette River below the Raymondville facility. Consultation with NYSDEC and USFWS indicated that the LRRP ROR operation would not adversely impact this species (Appendix A, page A-12). The downy phlox (state-endangered) was found in an unspecified location near the Norwood development. Consultation with NYSDEC and FWS indicated that the LRRP would not adversely impact this species (See Appendix A, page A-14).

During the current LIHI certification period, the LRRP has complied with both State and Federal resource agencies concerns and recommendations related to threatened and endangered species and no new areas of concern have occurred. It is unlikely that Project operations or related activities would adversely affect any

⁵³ <https://www.dec.ny.gov/animals/7494.html>



of these species even if any are present; therefore, the LRRP continues to satisfy the threatened and endangered species protection criterion.

G. LIHI Criterion-Cultural Resource Protection

The cultural and historic resource protection criterion is designed to ensure that the facility does not unnecessarily impact cultural and historic resources associated with the facility's lands and waters, including resources important to local indigenous populations.

The Applicant states the LIHI cultural and historic resources criterion in all eleven ZOE's is satisfied by meeting alternative standard G-2.

On February 6, 2002, EBH signed a Programmatic Agreement (PA) with FERC, the Advisory Council on Historic Preservation (ACHP), and the New York State Historic Preservation Officer (SHPO) for the four FERC licenses on the Raquette River, with the St. Regis Tribe and the USDOJ as concurring parties. On February 11, 2002, the ACHP filed with FERC the executed agreement that amended the previous 1996 PA.

There are no identified archaeological sites associated with the Project. While the Project was constructed in 1928 no structures meet the criteria for listing in the National Register of Historic Places and no properties of indigenous religious or cultural significance to the St. Regis Mohawk Tribe whose reservation is located about 20 miles downstream.

On April 14, 2003, Erie submitted its required Historic Property Management Plan⁵⁴ (HPMP) to FERC. On September 28, 2004, FERC issued an order approving the HPMP⁵⁵. The HPMP requires EBH to file an annual report. EBH has successfully complied with this requirement. The latest 2018 filing occurred on February 1, 2019⁵⁶.

Throughout the current LIHI Certification period, the LRRP has complied with all requirements related to cultural resource protection, mitigation or enhancement and no new areas of concern have arisen. Therefore, the LRRP continues to satisfy the cultural and historic resources protection criterion.

H. LIHI Criterion-Recreation

The goal of this criterion is to ensure that recreation activities on lands and waters controlled by the facility are accommodated and that the facility provides recreational access to its associated land and waters without fee or charge.

The application states that the LRRP satisfies the LIHI recreation criterion in all impoundments ZOE's (1, 3, 6 and 9) by meeting alternative standard H-2. The LIHI recreation criterion in all bypass ZOE's (4, 7 and 10) is satisfied by meeting alternative standard H-1. The LIHI recreation criterion in all downstream ZOE's (2, 5, 8 and 11) is satisfied by meeting alternative standard H-2.

License Article 404 required EBH to develop a Recreation Plan (RP), in consultation with the Raquette

⁵⁴ <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=10473424>

⁵⁵ <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=10255973>

⁵⁶ <https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=15153594>



River Advisory Committee (RRAC), which included measures to implement new recreational facilities at the LRRP developments. On April 11, 2003, EBH submitted their final RP⁵⁷. The RP was modified and approved by FERC on November 17, 2004⁵⁸.

Facilities provided within LRRP impoundments include:

- At Norwood: a canoe portage, boat launch and parking area, picnic facilities;
- At East Norfolk: a canoe portage with parking (take-out only);
- At Raymondville: a canoe portage, car top boat launch and picnic facilities with parking.

Facilities provided within downstream ZOE's include:

- At Norwood: a canoe portage, boat launch and parking area, picnic facilities;
- At Norfolk: a canoe portage with parking (put-in only);
- At Raymondville: a canoe portage, car top boat launch and picnic facilities with parking.

The recreation facilities were completed according to schedule in a timely manner. All facilities provide access to the reservoir and downstream reaches free of charge.

The most recent FERC environmental inspection conducted on July 26, 2017⁵⁹ found minor items related to signage needing replacement, vegetation obstructing signage, a small active erosion area needing repairs to avoid creating a tripping hazard, and installation of two picnic tables and two grills at the Raymondville day use area and at the Norwood car-top fishing access, in accordance with the RP. EBH submitted documentation of completion of the signage and erosion work on September 22, 2017.⁶⁰ At that time, EBH projected that the picnic tables and grills would be installed by May 31, 2018. EBH reported to LIHI on September 16, 2019 that installations were completed in the fall of 2018.

NLOA commented that there is no community input as to when the flashboards are put on and taken off and how the recreational community is affected, and due to the shallow nature of the impoundment there are hazards that have not been identified and marked.

The effect of the flashboards is to increase water depth in the reservoir during the summer recreation season. Flashboards at Norwood reservoir are 1 foot high and are typically installed after spring high flows then removed after Labor Day with the exact dates being dependent upon flow conditions and required maintenance work each year. EBH notifies the Norwood Lake Association and the Village of the flashboard timing well in advance. As noted above, EBH extended the season in 2019 and communicated that to NLOA (see footnote 4) and to the public.⁶¹

Throughout the current LIHI certification period, the LRRP has complied with all requirements related to recreation and no significant areas of concern were found. Therefore, the LRRP continues to satisfy the recreational criterion.

⁵⁷ (CEII privileged document)- <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10485845>

⁵⁸ <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10295185>

⁵⁹ <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14665475>

⁶⁰ <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14687840>

⁶¹ <https://www.northcountrynow.com/news/boaters-warned-brookfield-renewable-power-will-remove-boards-top-norwood-dam-sept-30-0266452>

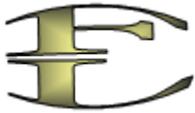


8. RECOMMENDATION

The application for LIHI recertification was adequate to allow for LIHI review. No material change in circumstances has occurred since the last recertification of this project. Based on my review of information submitted by the applicant and the additional documentation noted herein, I recommend that the Lower Raquette River Project be recertified for a term of five years with the following conditions:

1. The Facility Owner shall continue to provide annual reports to LIHI in annual compliance submittals that document operational deviations that occurred throughout the year whether unintentional or planned. The report will be due at the same time as the annual compliance statement.
2. The Facility Owner shall provide status updates in annual compliance submittals regarding any agreements related to the USGS gage relocation and/or other alternatives implemented for stream flow monitoring at Raymondville.

Gary M. Franc



FRANC LOGIC

Licensing & Compliance

Hydropower Consulting & Modeling



FRANC LOGIC

October 2019

APPENDIX A
DOCUMENTS



IPaC

U.S. Fish & Wildlife Service

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as **trust resources**) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

St. Lawrence County, New York



Local office

New York Ecological Services Field Office

☎ (607) 753-9334

☎ (607) 753-9699

3817 Luker Road Cortland, NY 13045-9385 <http://www.fws.gov/northeast/nyfo/es/section7.htm>



Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information.
2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i>	Threatened
No critical habitat has been designated for this species.	



<https://ecos.fws.gov/ecp/species/8045>

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur on the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.



NAME

BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL

ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE.

BREEDS ELSEWHERE INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.]

American Golden-plover *Pluvialis dominica*

Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Bald Eagle *Haliaeetus leucocephalus*

Breeds Dec 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. <https://ecos.fws.gov/ecof/species/1526>

Baldpate *Dalichonyx oryzivorus*

Breeds May 20 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Eastern Whip-poor-will *Antrastomus vociferus*

Breeds May 1 to Aug 20

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Lesser Yellowlegs *Tringa avipes*

Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <https://ecos.fws.gov/ecof/species/9579>

Semipalmated Sandpiper *Calidris pusilla*

Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.



Wood Thrush *Hyllocichla mustelina*

Breeds May 10 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report. **Probability of Presence ()**

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season ()

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

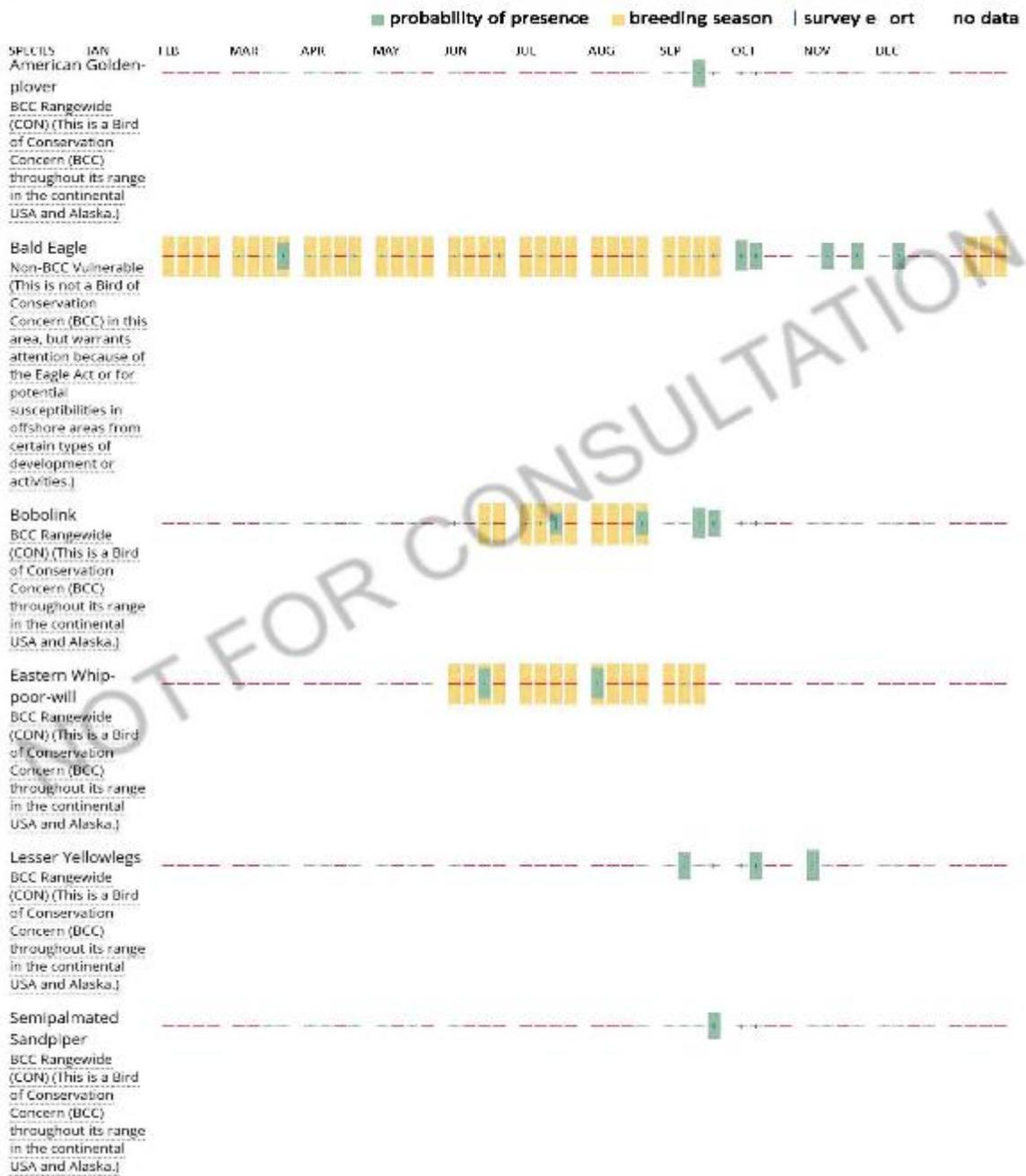
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

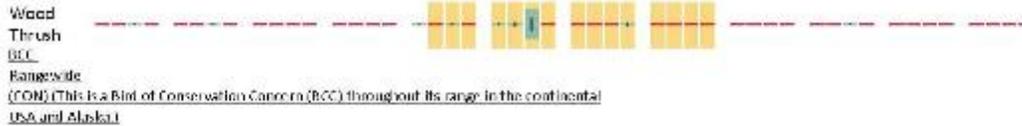
No Data ()

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas of the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) and/or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to shore activities or development.

Again, the Migratory Bird Resource List includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [E-bird Explore Data Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:



1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area on the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Divine Bird Study](#) and the [panotae studies](#) or contact [Calieb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities



National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

[PEM5E](#)

[PEM5C](#)

[PEM5A](#)

FRESHWATER FORESTED/SHRUB WETLAND

[PFO1E](#)

[PFO1/SS1E](#)

[PSS1E](#)

[PFO4/SS1E](#)

[PSS1/EM5E](#)

[PFO1C](#)

[PFO4E](#)

[PSS1C](#)

[PFO1/SS1C](#)

[PFO1A](#)

[PFO1/SS1Eh](#)



FRANC LOGIC

October 2019

Unofficial FERC-Generated PDF of 20061109-0108 Received by FERC OSEC 11/08/2006 in Docket#: P-2330-000

Brookfield Power

New York Operations
225 Greenhold Parkway, Suite 201
Liverpool, NY 13088

Tel (315) 413-2700
Fax (315) 461-8577
www.brookfieldpower.com

ORIGINAL

Via Express Mail

November 7, 2006

Mr. David A. Stilwell
Field Supervisor
U.S. Fish and Wildlife Service
New York Field Office
3817 Luker Road
Cortland, NY 13045-9349

FILED
OFFICE OF THE
SECRETARY
2006 NOV - 8 A 11: 37
FEDERAL ENERGY
REGULATORY COMMISSION

**Subject: Lower Raquette River Hydroelectric Project (P-2330)
Endangered Species Coordination
USFWS Project File No. 61256**

Dear Mr. Stilwell:

By letter dated May 27, 2006, Erie Boulevard Hydropower, LP's (Erie) consultant Devine Tarbell & Associates, Inc (DTA) submitted a letter to the United States Fish and Wildlife Service (USFWS) requesting consultation and information on federally endangered and threatened species relative to Erie's license amendment application for the Lower Raquette River Hydroelectric Project (P-2330).

By letter dated June 26, 2006 the USFWS identified the presence of the bald eagle (*Haliaeetus leucocephalus*) in the vicinity of the St. Lawrence River. Additionally, one bald eagle nest was stated to be located within eight miles of the Raymondville Development of the Lower Raquette River Project and no critical habitat for this species was identified by the USFWS in the vicinity of the Project. Each of the aforementioned letters was included within Erie's Application for License Amendment for the Lower Raquette River Project filed with the Federal Energy Regulatory Commission (FERC) by letter dated June 30, 2006.

By letter dated July 27, 2006, FERC designated Erie to act as FERC's non-federal representative for the purpose of Section 7 Endangered Species Act (ESA) consultation for the Application for Amendment of License filed with FERC (with a copy sent to your office) in July 2006.

In accordance with the responsibility granted to us by FERC, we are writing to you concerning Section 7 of the Endangered Species Act (Act) [16 U.S.C. 1531 *et seq.*] consultation for the Lower Raquette River Project, which is located on the Raquette River in St. Lawrence County, NY. In the Application for Amendment of License distributed to your office in July 2006, Erie fully describes the overall project, and addresses the project's effects on threatened or endangered species and/or critical habitat.

Consistent with Section 7 of the Endangered Species Act (Act) [16 U.S.C. 1531 *et seq.*] as well as with the USFWS's Final ESA Section 7 Consultation Handbook (March 1998), Erie, acting as FERC's non-federal representative for the purpose of Section 7 ESA consultation, concludes that the proposed

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November 7, 2006

Page 2 of 2

replacement of the existing turbine runners (construction will occur indoors within the existing, enclosed powerhouse structures at each facility) and the installation of seasonal upstream eel passage structures at each of the four developments that comprise the Project, will result in no effect on the bald eagle (*Haliaeetus leucocephalus*).

As part of the informal consultation process for the potential presence of the bald eagle (*Haliaeetus leucocephalus*) in the vicinity of the Lower Raquette River Project, a phone conversation was completed between Mr. David Culligan of Erie and Ms. Robyn Niver, Endangered Species Coordinator for the USFWS on November 3, 2006. During this conversation, Erie conveyed the nature and scope of the new work proposed under the amendment (turbine replacement work occurring indoors and installation of upstream eel conveyance structures at each development) and Erie conveyed its "no effect" determination for the bald eagle and that further consultation would not be needed.

In accordance with the procedures outlined in Section 7 of the Endangered Species Act (Act) [16 U.S.C. 1531 *et seq.*] as well as the USFWS's Final ESA Section 7 Consultation Handbook, (March 1998), the finding of no effect to the bald eagle (*Haliaeetus leucocephalus*) by Erie (in their capacity as representative for the purpose of Section 7 ESA consultation) ends the consultation process for the ESA.

Thank you very much for your participation and cooperation in this matter.

Very Truly Yours,

Samuel Hirschey, P.E.
Manager, Environmental Licensing and Land Use

cc: Attached Distribution List
M. Salas (FERC)
R. Grieve (FERC)
D. Culligan (Erie)
M. Hoover (DTA)



FRANC LOGIC

October 2019

Unofficial FERC-Generated PDF of 20060802-0069 Received by FERC OSEC 07/31/2006 in Docket#: P-2330-000

Brookfield Power

New York Operations
225 Greenfield Parkway, Suite 201
Liverpool, NY 13068

Tel (315) 413-2700
Fax (315) 461-8577
www.brookfieldpower.com

ORIGINAL

Via Express Mail

2006 JUL 31 A 9 56 July 28, 2006

Hon. Magalie R. Salas, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Subject: **Lower Raquette River Project FERC Project No. 2330**
Application for Capacity License Amendment
Agency Correspondence Addendum
Non-Internet Public

Dear Secretary Salas:

As part of pre-filing consultation for Erie Boulevard Hydropower, LP's (Erie) Application for Capacity License Amendment for the Lower Raquette River Project P-2330 (filed by letter dated June 30, 2006), the U.S. Fish and Wildlife comment letter dated April 20, 2006 (contained in Erie's June 30th filing) recommended that Erie update consultation relative to threatened and endangered species. By letter dated May 27, 2006 (contained in Erie's June 30th filing), Erie initiated such consultation with both the USFWS and the New York State Department of Environmental Conservation's (NYSDEC) Natural Heritage Program regarding the presence or absence of threatened or endangered species in the vicinity of the Lower Raquette River Project.

By letter dated June 26, 2006 (included in Erie's June 30th filing), the USFWS responded by suggesting that FERC designate Erie (and/or Erie's representatives) as their non-Federal representative for the purposes of conducting consultation. USFWS also noted the presence of the bald eagle in the vicinity of the project area. Erie is willing to act as FERC's designated non-Federal representative if required, and the turbine replacement activities and change to run of river operations proposed under the amendment application are not expected to have an adverse impact on the bald eagle.

Additionally, Erie received the attached June 29, 2006 correspondence from the New York State Department of Environmental Conservation's (NYSDEC) Natural Heritage Program. Since this letter was received after Erie's June 30th amendment application filing, the letter was not included in that filing. And because the NYSDEC has indicated that its letter contains sensitive information, this filing is being submitted as Non-Internet Public. NYSDEC reviewed their database and identified the following species in the vicinity of the Lower Raquette Project.

Yellow Lampmussel: This species does not have a listed status with the State of New York; however it is classified as a vulnerable species.

A Mussel Survey was completed for the Lower Raquette Project in July 2000, and the presence of the species in the vicinity of the Norwood and Raymondville was documented. The populations were determined to be healthy, and the potential impact associated with the operation of the hydroelectric facilities was associated with the potential for water level variations. The switch from a store and pulse mode of operation to a run-of-river operation proposed by the license amendment application will further reduce water level

NON-INTERNET PUBLIC





Hon. Magalie R. Salas, Secretary
July 28, 2006
Page 2

variations. In their 2001 Environmental Assessment, FERC indicated there was no need to further investigate potential impacts to this species.

Although field investigations to document the status of the populations within the Raquette River were not requested or performed as part of pre-filing consultation, Erie's proposed change to run of river operation will reduce water level variations and is not expected to have an adverse effect on the health and robustness of the existing populations of Yellow Lampmussels in the vicinity of the Lower Raquette River Project.

Lake Sturgeon: This species is listed as Threatened by the State of New York.

Previous regulatory actions have not resulted in the identification of this species in the vicinity of the Lower Raquette Project; however the latest Natural Heritage database indicates that the species has been caught in the Raquette River below the Raymondville facility. Although habitat studies relative to Lake Sturgeon were not requested or performed as part of pre-filing consultation, Erie's proposed change to run of river operations will reduce water level variations and is not expected to have an adverse effect on Lake Sturgeon (minimizing flow perturbations is generally considered beneficial to fisheries habitat).

Downy Phlox: This plant species is listed as Endangered by the State of New York.

Previous regulatory actions have not resulted in the identification of this species in the vicinity of the Lower Raquette Project; however the latest Natural Heritage database indicates that the species has been identified in an unspecified location in Norwood. The habitat preference for this plant species is meadows and wooded areas with dry soils (<http://www.nearctica.com/flowers/otos/polemon/Ppilosa.htm>). Although habitat studies for the Downy phlox were not requested or performed as part of pre-filing consultation, the preferred habitat of dry soils in a meadow or woodland setting are not expected to be adversely impacted by Erie's proposed change to run of river operations or by any work activities associated with turbine installation since all such work will occur inside each powerhouse of the Lower Raquette River Project.

If you have any questions or comments, please do not hesitate to contact the undersigned at (315) 413-2792.

Very truly yours,

David W. Culligan, P.E.
Licensing Coordinator

Enclosure
cc:

W. Little, NYSDEC
A. Richardson, NYSDEC
N. Conrad, NYSDEC
B. Fenlon, NYSDEC
S. Hirschey, Erie
T. Skutnik, Erie
T. Smith, Erie
W. Madden, Winston and Strawn
M. Hoover, DTA



New York State Department of Environmental Conservation
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, 5th floor, Albany, New York 12233-4757
Phone: (518) 402-8935 • FAX: (518) 402-8925
Website: www.dec.state.ny



June 29, 2006

Michael Hoover
Devine Tarbell & Associates, Inc.
970 Baxter Blvd
Portland, Maine 04103

Dear Mr. Hoover:

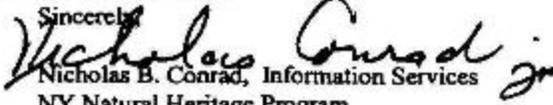
In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to an Environmental Assessment for the proposed FERC 2330 License Amendment Application - Lower Raquette River Project, area as indicated on the map you provided, located in St. Lawrence County.

Enclosed is a report of rare or state-listed animals and plants, significant natural communities, and other significant habitats, which our databases indicate occur, or may occur, on your site or in the immediate vicinity of your site. The information contained in this report is considered sensitive and may not be released to the public without permission from the New York Natural Heritage Program.

The presence of rare species may result in this project requiring additional permits, permit conditions, or review. For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, at the enclosed address.

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our databases. We cannot provide a definitive statement on presence or absence of all rare or state-listed species or significant natural communities. This information should not be substituted for on-site surveys that may be required for environmental impact assessment.

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

Sincerely,

Nicholas B. Conrad, Information Services
NY Natural Heritage Program

Enc.
cc: Reg. 6, Wildlife Mgr.
Reg. 6, Fisheries Mgr.
Mark Wothol, Bureau of Habitat, Albany



USERS GUIDE TO NY NATURAL HERITAGE DATA

New York Natural Heritage Program, 625 Broadway, 5th Floor, Albany, NY 12233-4757 phone: (518) 402-8935



NATURAL HERITAGE PROGRAM: The NY Natural Heritage Program is a partnership between the NYS Department of Environmental Conservation (NYS DEC) and The Nature Conservancy. Our mission is to enable and enhance conservation of rare animals, rare plants, and significant communities. We accomplish this mission by combining thorough field inventories, scientific analyses, expert interpretation, and the most comprehensive database on New York's distinctive biodiversity to deliver the highest quality information for natural resource planning, protection, and management.

DATA SENSITIVITY: The data provided in the report are ecologically sensitive and should be treated in a sensitive manner. The report is for your in-house use and should not be released, distributed or incorporated in a public document without prior permission from the Natural Heritage Program.

EO RANK: A letter code for the quality of the occurrence of the rare species or significant natural community, based on population size or area, condition, and landscape context.

- A-E = Extant: A=Excellent, B=Good, C=Fair, D=Poor, E=Extant but with insufficient data to assign a rank of A-D.
- F = Failed to find. Did not locate species during a limited search, but habitat is still there and further field work is justified.
- H = Historical. Historical occurrence without any recent field information.
- X = Extirpated. Field/other data indicates element/habitat is destroyed and the element no longer exists at this location.
- U = Extant/historical status uncertain.
- Blank = Not assigned.

LAST REPORT: The date that the rare species or significant natural community was last observed at this location, as documented in the Natural Heritage databases. The format is most often YYYY-MM-DD.

NY LEGAL STATUS – Animals:

Categories of Endangered and Threatened species are defined in New York State Environmental Conservation Law section 11-0535. Endangered, Threatened, and Special Concern species are listed in regulation 6NYCRR 182.5.

- E - Endangered Species:** any species which meet one of the following criteria:
 - Any native species in imminent danger of extirpation or extinction in New York.
 - Any species listed as endangered by the United States Department of the Interior, as enumerated in the Code of Federal Regulations 50 CFR 17.11.
- T - Threatened Species:** any species which meet one of the following criteria:
 - Any native species likely to become an endangered species within the foreseeable future in NY.
 - Any species listed as threatened by the U.S. Department of the Interior, as enumerated in the Code of the Federal Regulations 50 CFR 17.11.
- SC - Special Concern Species:** those species which are not yet recognized as endangered or threatened, but for which documented concern exists for their continued welfare in New York. Unlike the first two categories, species of special concern receive no additional legal protection under Environmental Conservation Law section 11-0535 (Endangered and Threatened Species).
- P - Protected Wildlife** (defined in Environmental Conservation Law section 11-0103): wild game, protected wild birds, and endangered species of wildlife.
- U - Unprotected** (defined in Environmental Conservation Law section 11-0103): the species may be taken at any time without limit; however a license to take may be required.
- G - Game** (defined in Environmental Conservation Law section 11-0103): any of a variety of big game or small game species as stated in the Environmental Conservation Law, many normally have an open season for at least part of the year, and are protected at other times.

NY LEGAL STATUS – Plants:

The following categories are defined in regulation 6NYCRR part 193.3 and apply to NYS Environmental Conservation Law section 9-1503

- E - Endangered Species:** listed species are those with:
 - 5 or fewer extant sites, or
 - fewer than 1,000 individuals, or
 - restricted to fewer than 4 U.S.G.S. 7 ½ minute topographical maps, or
 - species listed as endangered by U.S. Dept. of Interior, as enumerated in Code of Federal Regulations 50 CFR 17.11.
- T - Threatened:** listed species are those with:
 - 6 to fewer than 20 extant sites, or
 - 1,000 to fewer than 3,000 individuals, or
 - restricted to not less than 4 or more than 7 U.S.G.S. 7 and ½ minute topographical maps, or
 - listed as threatened by U.S. Department of Interior, as enumerated in Code of Federal Regulations 50 CFR 17.11



R - Rare: listed species have:

- 20 to 35 extant sites, or
- 3,000 to 5,000 individuals statewide.

V - Exploitably vulnerable: listed species are likely to become threatened in the near future throughout all or a significant portion of their range within the state if causal factors continue unchecked.

U - Unprotected: no state status.

FEDERAL STATUS (PLANTS and ANIMALS): The categories of federal status are defined by the United States Department of the Interior as part of the 1974 Endangered Species Act (see Code of Federal Regulations 50 CFR 17). The species listed under this law are enumerated in the Federal Register vol. 50, no. 188, pp. 39526 - 39527. The codes below without parentheses are those used in the Federal Register. The codes below in parentheses are created by Heritage to deal with species which have different listings in different parts of their range, and/or different listings for different subspecies or varieties.

(blank) = No Federal Endangered Species Act status.

LE = Formally listed as endangered.

LT = Formally listed as threatened.

C = Candidate for listing.

LE,LT = Formally listed as endangered in part of its range, and as threatened in the other part; or, one or more subspecies or varieties is listed as endangered, and the others are listed as threatened.

LT,PDL = Populations of the species in New York are formally listed as threatened, and proposed for delisting.

GLOBAL AND STATE RANKS (animals, plants, ecological communities and others): Each element has a global and state rank as determined by the NY Natural Heritage Program. These ranks carry no legal weight. The global rank reflects the rarity of the element throughout the world and the state rank reflects the rarity within New York State. Intraspecific taxa are also assigned a taxon rank to reflect the intraspecific taxon's rank throughout the world. ? = Indicates a question exists about the rank. Range ranks, e.g. S1S2, indicate not enough information is available to distinguish between two ranks.

GLOBAL RANK

G1 - Critically imperiled globally because of extreme rarity (5 or fewer occurrences), or very few remaining acres, or miles of stream) or especially vulnerable to extinction because of some factor of its biology.

G2 - Imperiled globally because of rarity (6 - 20 occurrences, or few remaining acres, or miles of stream) or very vulnerable to extinction throughout its range because of other factors.

G3 - Vulnerable: Either rare and local throughout its range (21 to 100 occurrences), or found locally (even abundantly at some of its locations) in a restricted range (e.g. a physiographic region), or vulnerable to extinction throughout its range because of other factors.

G4 - Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.

G5 - Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.

GH - Historically known, with the expectation that it might be rediscovered.

GX - Species believed to be extinct.

NYS RANK:

S1 - Critically imperiled: Typically 5 or fewer occurrences, very few remaining individuals, acres, or miles of stream, or some factor of its biology making it especially vulnerable in New York State.

S2 - Imperiled: Typically 6 to 20 occurrences, few remaining individuals, acres, or miles of stream, or factors demonstrably making it very vulnerable in New York State.

S3 - Vulnerable: Typically 21 to 100 occurrences, limited acreage, or miles of stream in New York State.

S4 - Apparently secure in New York State.

S5 - Demonstrably secure in New York State.

SH - Historically known from New York State, but not seen in the past 15 years.

SX - Apparently extirpated from New York State.

SxB and SxN, where Sx is one of the codes above, are used for migratory animals, and refer to the rarity within New York State of the breeding (B)populations and the non-breeding populations (N), respectively, of the species.

TAXON (T) RANK: The T-ranks (T1 - T5) are defined the same way as the Global ranks (G1 - G5), but the T-rank refers only to the rarity of the subspecific taxon.

T1 through T5 - See Global Rank definitions above.

Q - Indicates a question exists whether or not the taxon is a good taxonomic entity.

Revised April.



FRANC LOGIC

October 2019

From: Hogan, Chris M (DEC) <chris.hogan@dec.ny.gov>
Sent: Wednesday, August 14, 2019 2:01 PM
To: Zehr, Jason <Jason.Zehr@brookfieldrenewable.com>
Cc: VanMaaren, Chris C (DEC) <chris.vanmaaren@dec.ny.gov>
Subject: Brookfield WQCs

CAUTION: This email originated from outside of the organization. Do not click on links or open attachments unless you recognize content is safe. Please report suspicious emails [here](#)

ATTENTION: Ce courriel provient d'une source externe, ne cliquez pas sur les liens et n'ouvrez pas les pièces jointes, à moins que vous en reconnaissiez la source. Veuillez nous aviser [ici](#) de tout courriel suspect.

Jason – Chris VanMaaren forwarded me your email requesting that the NYSDEC confirm that the Section 401 Water Quality Certificates (WQC) for the Brookfield Renewable facilities listed below are still in effect.

Lower Raquette River (P-2330) – WQC effective date of October 2006
Middle Raquette River (P-2320) – WQC effective date of October 2006
School Street (P-2539) – WQC effective date of October 2006
Hoosic River (P-2616) – WQC effective date of September 2002

This email serves to confirm that the WQCs for the above reference facilities were issued to expire concurrent with the FERC license. As such, all of the NYSDEC WQCs are valid and in full effect for these facilities.

If you need anything further from the NYSDEC please contact me.

Christopher M. Hogan
Chief, Major Project Management Unit
Department of Environmental Conservation
Division of Environmental Permits
625 Broadway, 4th Floor
Albany, NY 12233-1750
(518) 402-9151
chris.hogan@dec.ny.gov



APPENDIX B
COMMMENT LETTER



As homeowners on the Norwood Raquette River Impoundment we would like to offer public comment in regard to Brookfield's certification.

This impoundment is described by FERC as:

FERC Project No. 2330 - Norwood - Consists of a 24-foot-high by 188-foot-long dam with 1-foot-high wooden flashboards, a 350-acre reservoir, a gated concrete intake structure with trashracks and a log chute, a powerhouse containing a 2,000-kilowatt (kW) generating unit, a 3-mile-long transmission line, and appurtenant facilities.

We feel Brookfield's application for certification should receive extra scrutiny due to deficiencies and omissions in the following criteria categories:

6 3.2.1 Criterion A - Ecological Flow Regimes

6 3.2.2 Criterion B - Water Quality

9 3.2.5 Criterion E – Shoreline and Watershed Protection

11 3.2.8 Criterion H - Recreational Resources

As background this impoundment is relatively shallow and is impacted significantly by the 1-foot-high wooden flashboards that are put around Memorial Day and taken off around Labor Day and are for the recreational benefit during the summer.

Aside from the seasonal fluctuations from the flashboards, the last three years, there have been significant, extended duration drawdowns. The reservoir was lowered 10+ ft in September of 2017 with no notice to property owners. See video: https://youtu.be/L_Nq1d4mG-0?t=110. Again in September 2018, the reservoir was lowered several feet below the dam crest and stayed at lower levels until August 2019 with a brief change in water levels for the spring run-off. The brief change in levels is due to the reservoir operating in a "run of river" configuration.

As can be seen from the video, there was significant exposure of the reservoir bed during these drawdowns leading to extensive mollusk and fish kill, as well as degradation of the shoreline habitat and increased shoreline erosion from runoff. At the current time, visual inspection finds the mollusk level is reduced so as to be near non-existent.

An assessment by a local aquatic biologist estimated as many as 70 million mussels were killed as result of the 2017 drawdown alone.

It is especially concerning that these drawdowns are not mentioned in the applications. The third term certification (October 2015) provided by LIHI stated:

Facility owner shall provide annual reports to LIHI documenting operational deviations from instream flow or pond levels that occurred throughout each year of certification. The report shall describe all deviations that have occurred, regardless of whether the deviations were planned or unintentional or whether they are eventually deemed as not violating the license by FERC. The report is due at the same time as the annual compliance statement and payment of the annual certification fee.

We do not see any evidence of such reporting and the deviations are not documented in this year's application.

We recognize the need to maintain the dam, however, the lack of timely communication and information about remediation from these drawdowns is of concern. Brookfield has a local compliance officer but information requests from that individual generally go unanswered. The



infrequent and scant communication we do receive comes from a regional manager responsible for stakeholder relations.

We feel this lack of communication is inconsistent with the goals of the LIHI stating :

Goal: The facility accommodates recreation activities on lands and waters controlled by the facility and provides recreational access to its associated lands and waters without fee or charge.

*Introduction to Standards: To pass the recreation criterion for LIHI certification, the applicant shall demonstrate compliance with at least one of the following standards. In all cases, the **applicant shall demonstrate that flow-related recreational impacts are mitigated to a reasonable extent in all zones where there is flow-related recreation.** Where there is recognized, flow-related recreational use, the facility shall provide the public with relevant and up-to-date information on reservoir levels and river flows, preferably real-time updates. It is understood that recreational activities must be consistent with the assurance of reasonable safety of employees and the public, and with critical infrastructure protection dictated by state or federal authorities.*

This type of communication is not occurring.

In addition to the drawdown, concerns about water quality have also not been addressed. The following video: https://youtu.be/HceJEOWNJ_Y?t=159 was sent to Brookfield with concerns about the large quantities of foam observed on the reservoir, but no response was received from Brookfield.

From these drawdowns the following have gone unaddressed or, if addressed, have not been communicated.

Shoreline erosion

Ecological impact – there is a study from one of the drawdowns that 70 million mussels were killed.

Impact on the water quality

On-going concerns not related to the drawdowns:

Invasive milfoil – we are not aware of any efforts by Brookfield to address this issue with local communities other than to recognize that it is an issue.

Recreation – During the spring, summer and autumn, homeowners along the waterfront as well as non-residents who access the water at a public boat launch use the impoundment for fishing, swimming, and both motorized and non-motorized boating. A primary recreational use is crew rowing with a vibrant collegiate and community rowing program. There is no community input as to when the flashboards are put on and taken off and how the recreational community is affected.

Because of the shallow nature of the impound there are hazards that have not been identified and marked.

Please let us know if there are any questions.

Norwood Lakefront Owners' Assoc.

nlakefront@gmail.com