



**Low Impact Hydropower Institute’s (LIHI)
Certification Review for the
Sawmill, Cross, Upper Gorham and Shelburne
Hydroelectric Projects**

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1. BACKGROUND

The Sawmill, Cross, Upper Gorham and Shelburne Projects are located in Coos County, northern New Hampshire, along an 11-mile reach of the Androscoggin River that stretches from the City of Berlin, south to the Town of Shelburne. The Federal Energy Regulatory Commission (FERC) licensed each of these Projects to James River New Hampshire Electric, Inc. (JRNHE) under separate 30-year licenses with each issued on August 1, 1994 and expiring on July 31, 2024. Sawmill¹ is licensed as FERC Project No. 2422, Cross² is licensed as FERC Project No. 2326, Upper Gorham³ is licensed as FERC Project No. 2311 and Shelburne⁴ is licensed as FERC Project No. 2300.

JRNHE was subsequently renamed American Tissue-New Hampshire Electric, Inc. (ATNHE). On June 3, 2002⁵, ATNHE and GNE, LLC (GNE) jointly submitted an application to transfer license ownership to GNE after a bankruptcy sale of ATNHE to GNE. On August 12, 2002⁶, GNE filed notice of changing its name to Great Lakes Hydro America LLC (GLHA). All four developments are currently owned by GLHA which is a subsidiary of Brookfield Renewable Partners (BRP).⁷

Sawmill is located at approximate river mile (RM) 138.2 on the Androscoggin River and is the most upstream development in the LIHI application. It is approximately 0.4 miles upstream of GLHA's Riverside Project (FERC Project No. 2423), a development that is not part of the LIHI application. Cross is located at approximate RM 136.1 on the Androscoggin River, 2.1 miles downstream of Sawmill, and below the J. Brodie Smith Project (FERC Project No. 2287), licensed to Central Rivers Power (CRP). Upper Gorham is located within the town of Gorham, at RM 132.6, 3.5 miles downstream of Cross and above CRP's Gorham Project (FERC Project No. 2288, LIHI #153). Lastly, Shelburne is located within the town of Shelburne, at RM 128.4, 4.2 miles downstream of the Upper Gorham and Gorham Projects.

Given this situation and that these four Projects are licensed separately and none of them are contiguous, this certification review will be conducted by evaluating each of the four as separate LIHI applications.

A Section 401 Water Quality Certificate (WQC) was issued by the New Hampshire Department of Environmental Services (NHDES) for the Sawmill Project on December 18, 1991⁸, the Cross Project on December 13, 1991⁹, the Upper Gorham Project on October 26, 1993¹⁰ and the Shelburne Project on December 13, 1991¹¹.

¹ <https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13711044>

² <https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=12148376:1>

³ <https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13711045>

⁴ <https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=3462638>

⁵ <https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=1011183:1>

⁶ <https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=10716935>

⁷ Kelly Maloney; Manager, Compliance – Northeast, Brookfield Renewable Partners, 150 Main Street, Lewiston, Maine 04240 -- (207) 755-5606 - Kelly.Maloney@brookfieldrenewable.com

⁸ Appendix A, page A-2

⁹ Appendix A, page A-5

¹⁰ Appendix A, page A-8

¹¹ Appendix A, page A-11



A summary of each Project’s rated capacity and average annual generation for calendar years 2014 through 2018 is shown in Table 1.

Project	Rated Capacity (MW)	Average Annual Generation (MWh)	Plant Factor (%)
Sawmill	3.17	15,899	57.3
Cross	3.22	15,025	53.3
Upper Gorham	4.80	14,859	35.3
Shelburne	3.72	10,470	32.1
Total	14.91	56,253	43.1

GLHA submitted an application for LIHI certification on April 17, 2020. On June 30, 2020, LIHI notified GLHA that the intake review for the Project was complete. The intake review found that a revised application was needed. GLHA supplied a revised application on August 13, 2020 and LIHI posted the application for public comment. The 60-day public comment period ended on October 12, 2020.

2. ANDROSCOGGIN RIVER BASIN

The Androscoggin River is located in the states of New Hampshire and Maine, in northern New England. It is 178 miles long, draining 3,530 square miles (SQMI) with 720 SQMI within New Hampshire. The river joins the Kennebec River at Merrymeeting Bay in Maine before it empties into the Gulf of Maine and the Atlantic Ocean. (See Figure 1).

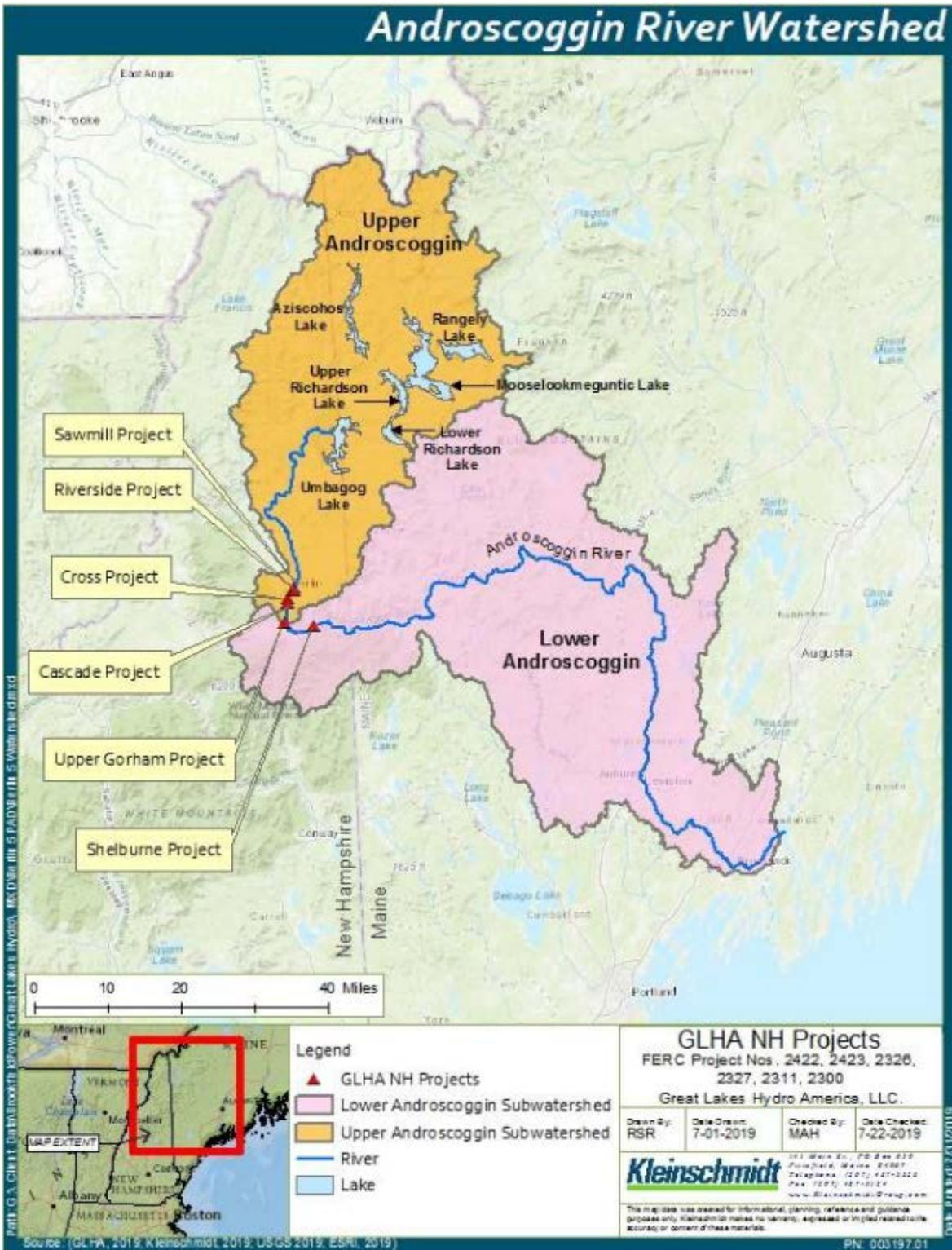
The Androscoggin River drops more than 1,500 feet in its journey from the Rangeley Lakes in Maine, through northeastern New Hampshire, reentering Maine near Bethel and flowing through the state to Merrymeeting Bay. The Androscoggin River watershed can be broken down into two sections, the upper and lower Androscoggin River watersheds.

The Little Androscoggin River is its largest tributary, flowing from Bryant Pond through Oxford County including Norway and South Paris, Maine, finally joining the main stem at Auburn, Maine. Other tributaries are the Nezinscot River at Turner, Maine, the Webb River at Dixfield Village, Maine and the Ellis and the Swift Rivers joining at Rumford, Maine. In Rumford (LIHI #38), the river drops 177 feet in one mile at Pennacook Falls. The river continues south through Livermore, Livermore Falls (including the Riley, Jay, Otis and Livermore developments, LIHI #48), Auburn, Lewiston, Lisbon and Durham, Maine. Despite its steep gradient, a large portion of the river’s floodplain is farmed for corn, potatoes, hay and other crops along much of its length in Maine.

The most upstream development in the LIHI application (Sawmill) is located 18 river miles downstream from where the river flows from Maine into New Hampshire. The most downstream development in the application (Shelburne) is located about 6 river miles before the rivers reenters the state of Maine.



Figure 1. Androscoggin River Watershed





The basin contains numerous dams that generate hydroelectric power. The hydroelectric facilities associated with this LIHI certification are italicized. The Projects from upstream to downstream include:

1. Errol Project at RM 170.1 owned by GLHA and licensed as FERC Project 3133;
2. Pontook Project at RM 152.4 owned by Pontook Operating LP and licensed as FERC Project 2861;
3. *Sawmill Project at RM 139.2 owned by GLHA and licensed as FERC Project 2422;*
4. Riverside Project at RM 138.8 owned by GLHA and licensed as FERC Project 2423;
5. J. Brodie Smith Project at RM 138.2 owned by Central Rivers Power (CRP) and licensed as FERC Project 2287;
6. *Cross Project at RM 136.9 owned by GLHA and licensed as FERC Project 2326;*
7. Cascade Project at RM 136.3 owned by GLHA and licensed as FERC Project 2327;
8. *Upper Gorham Project at RM 133.2 owned by GLHA and licensed as FERC Project 2311;*
9. Gorham Project at RM 130.4 owned by CRP and licensed as FERC Project 2519;
10. *Shelburne Project at RM 127.6 owned by GLHA and licensed as FERC Project 2300;*
11. Rumford Falls Upper & Middle Dam at RM 90.9 and 90.7 owned by Rumford Falls Power Company (RFPC) and licensed as FERC Project 2333 (LIHI #38);
12. Riley Project at RM 69.3 and Jay Project (RM 66.6) owned by Eagle Creek Renewable Energy LLC (ECRE) and licensed as FERC Project 2375 (part of LIHI #48);
13. Otis (RM 63.8) Project owned by ECRE and licensed as FERC Project FERC 8277;
14. Livermore Falls (RM 61.2) owned by ECRE and licensed as FERC Project FERC 2375;
15. Gulf Island Project at RM 35.0 owned by GLHA and licensed as FERC Project 2283;
16. Lewiston Falls Project at RM 30.8 owned by GLHA and licensed as FERC Project 2302;
17. Worumbo Project at RM 15.7 owned by Brown Bear II Hydro, Inc. (BBIH) licensed as FERC Project 3428 (LIHI #10).
18. Pejepscot Project at RM 12.5 owned by Topsham Hydro Partners LP (THP) and licensed as FERC Project 4784.
19. Brunswick Project at RM 8.0 owned by GLHA and licensed as FERC Project 2284.

All these sites operate in accordance with a 1983 Androscoggin River Headwater Benefits Agreement (ARHBA)¹². FERC approved the ARHBA¹³ on June 30, 1992. The ARHBA states the Errol dam will release a volume of at least 1,550 cubic feet per second per day (CFSD) provided that:

1. Volume releases from Aziscohos Lake into the Magalloway River are sufficient to provide at least one-third of the annual volume release at the Errol dam. The Magalloway River joins the Androscoggin River just upstream of the Errol Dam;
2. In the judgement of the Engineering Committee¹⁴ sufficient volume is in the upstream storage ponds to furnish and maintain the 1,550 CFSD at Berlin; and;
3. Any party to the agreement requests in writing that the 1,550 CFSD be released and discharged.

There are no downstream fish passage facilities installed at any of the hydroelectric sites located above the Sawmill impoundment. In 1983 the first Project on the river, Brunswick installed upstream and downstream passage followed by the Pejepscot Hydropower Project in 1987 and the Worumbo Project 1988. This provided an opportunity for anadromous species to migrate upstream as far as Lewiston Falls.

¹² Appendix A – page A-14

¹³ Appendix A, page A-36

¹⁴ Engineering Committee consists of five members, each representing a hydro owner on the Androscoggin River.



3. ZONES OF EFFECT (ZOE)s

The application defines thirteen ZOE's from upstream to downstream for the four developments.

Sawmill ZOE's 1 through 3 are shown in Figure 2 and Figure 3 and are defined as:

- ZOE 1.1 is the Sawmill impoundment, RM 139.8 to 138.2;
- ZOE 1.2 is the Sawmill bypass reach, RM 138.4 to 138.1;
- ZOE 1.3 is the Sawmill tailrace, RM 138.2 to 138.0.

The downstream Riverside Project's impoundment backs up and begins at the confluence of ZOE's 1.2 and 1.3 immediately downstream.

Figure 2. Sawmill Impoundment ZOE 1.1





Figure 3. Sawmill Bypassed Reach, ZOE 1.2 and Tailrace, ZOE 1.3



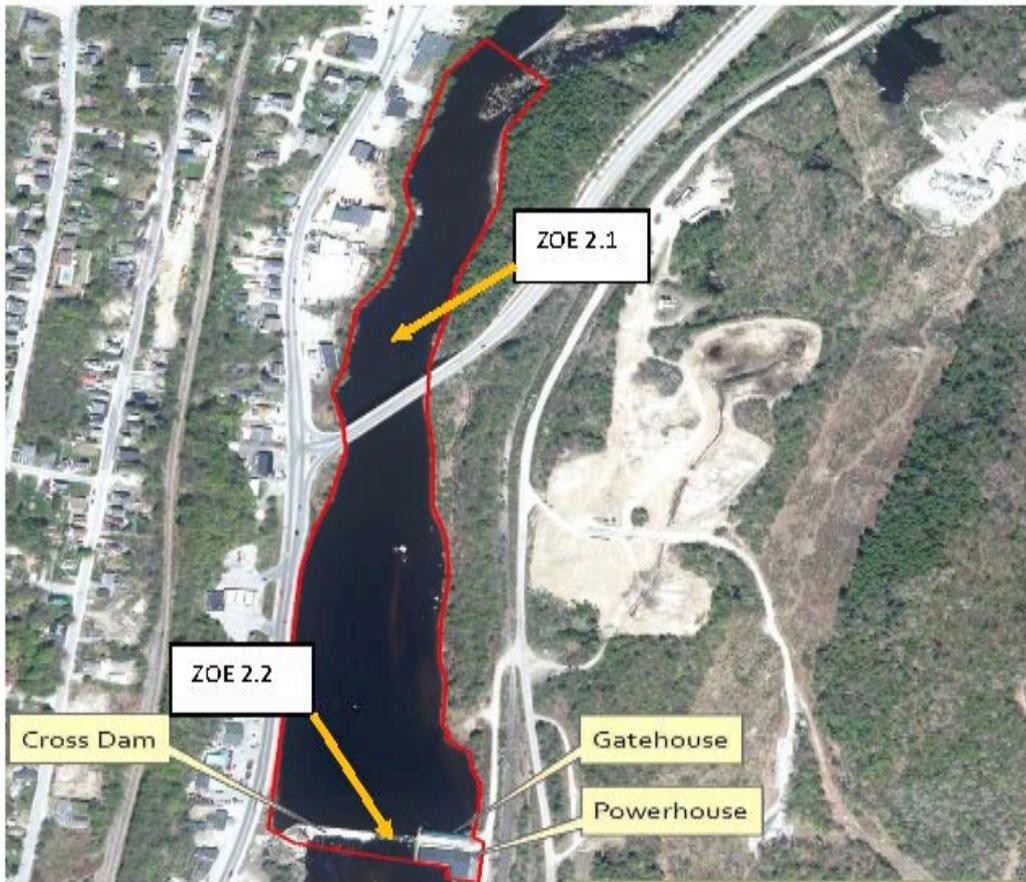
Cross ZOE 1 through 2 are shown in Figure 4 and are defined as:

- ZOE 2.1 is the Cross impoundment, RM 136.7 to 136.1;
- ZOE 2.2 is the Cross bypass reach, RM 136.1 to 136.0.

The Project does not have a downstream reach since the downstream Cascade Project's impoundment backs up and begins at the confluence of ZOE 2.1 and 2.2 immediately downstream of the Cross dam.



Figure 4. Cross Impoundment, ZOE 2.1 and Bypassed Reach, ZOE 2.2

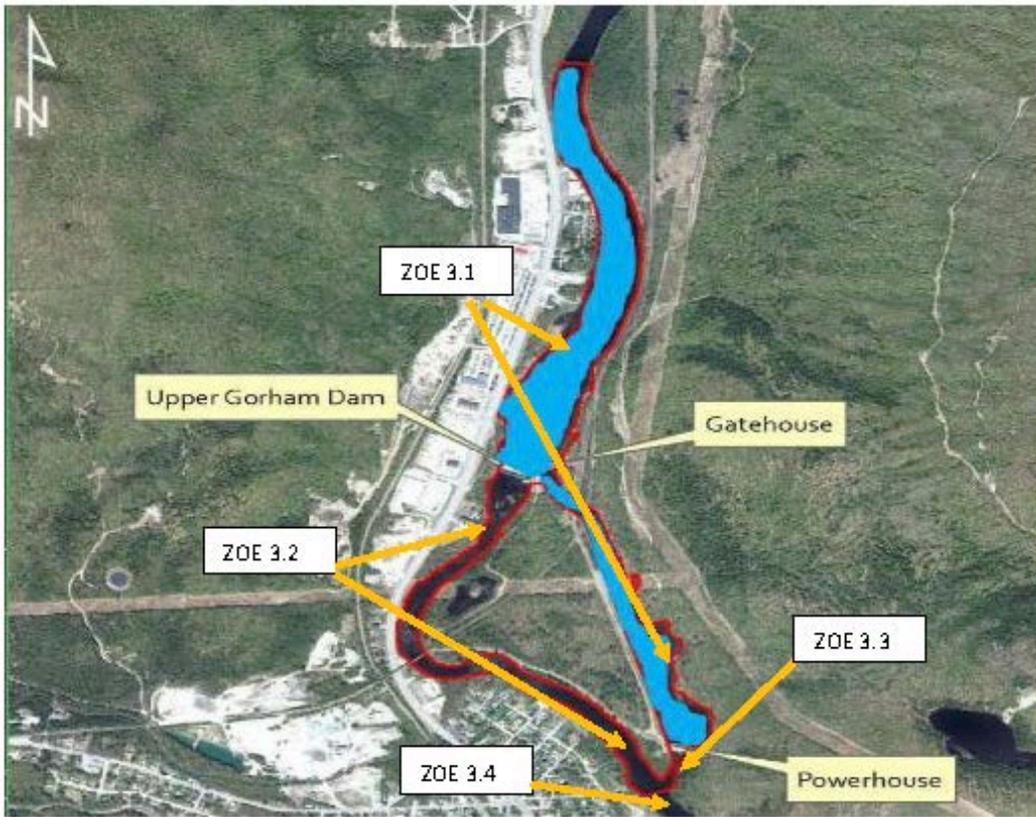


Upper Gorham ZOE 1 through 4 are shown in Figure 5 and are defined as:

- ZOE 3.1 is the Upper Gorham impoundment, RM 135.5 to 132.6;
- ZOE 3.2 is the Upper Gorham bypass reach, RM 132.6 to 131.6;
- ZOE 3.3 is the Upper Gorham tailrace, RM 131.6 to 131.4;
- ZOE 3.4 is the Upper Gorham downstream reach, RM 131.4 to 131.1.



Figure 5. Upper Gorham ZOEs



Shelburne ZOEs 1 through 4 are shown in Figure 6 and Figure 7 and are defined as:

- ZOE 4.1 is the Shelburne impoundment, RM 129.8 to 128.4;
- ZOE 4.2 is the Shelburne bypass reach, RM 128.4 to 128.3;
- ZOE 4.3 is the Shelburne tailrace, RM 128.3 to 128.1;
- ZOE 4.4 is the Shelburne downstream reach, RM 128.1 to 126.5.



Figure 6. Shelburne Impoundment, ZoE 4.1

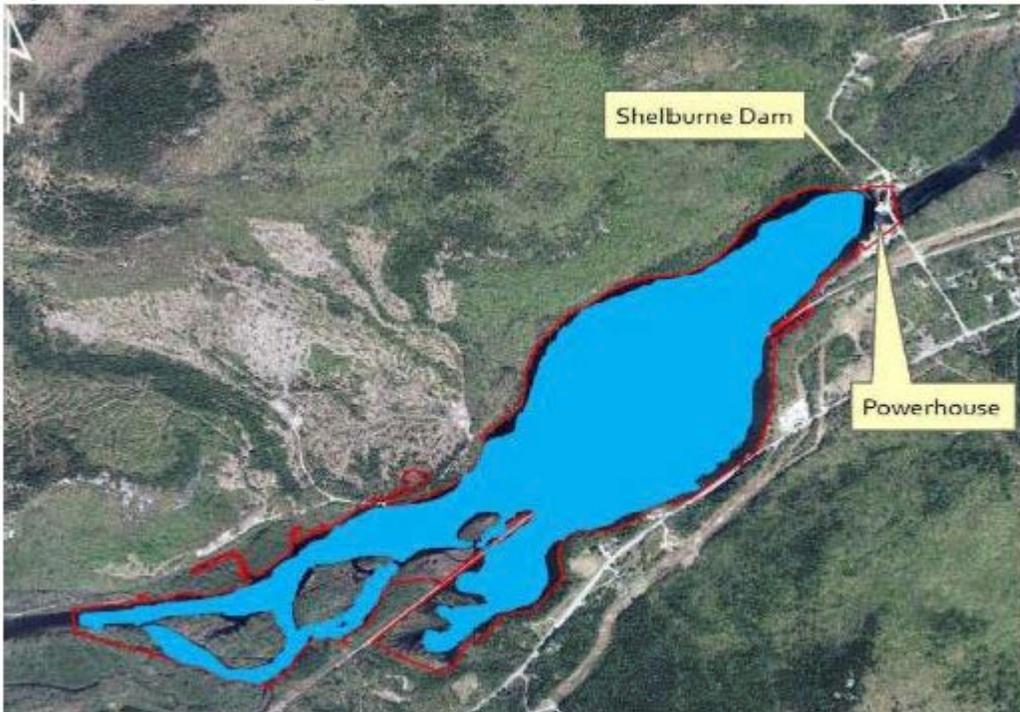


Figure 7. Shelburne Bypassed Reach, ZoE 4.2 and Tailrace, ZoE 4.3





The alternative standards selected to satisfy the LIHI certification criteria in each of these ZOE's are identified in the Table 2. As part of my review process, I checked and agreed with their selection, with the exception of the changes I have noted in **RED**.

Table 2 – CRITERION STANDARD SELECTIONS

Zone	A	B	C	D	E	F	G	H
	Ecological Flows	Water Quality	Upstream Fish Passage	Downstream Fish Passage	Shoreline and Watershed Protection	Threatened and Endangered Species	Cultural and Historic Resources	Recreational Resources
1.1.Sawmill Impoundment	1	2 , 3	1	1	2 , 3	2	1 , 2	2
1.2. Sawmill Bypassed Reach	2	2 , 3	1	1	1 , 3	2	1 , 2	1
1.3. Sawmill Tailrace	1	2 , 3	1	1	2 , 3	2	1 , 2	2
2.1. Cross Impoundment	1	2 , 3	1	1	2 , 3	2	1 , 2	1 , 2
2.2. Cross Bypassed Reach	2	2 , 3	1	1	1 , 3	2	1 , 2	1
3.1. Upper Gorham Impoundment	1	2 , 3	1	1	2 , 3	2	1 , 2	2
3.2. Upper Gorham Bypassed Reach	2	2 , 3	1	1	1 , 3	2	1 , 2	1
3.3. Upper Gorham Tailrace	2	2 , 3	1	1	2 , 3	2	1 , 2	2
3.4 Upper Gorham Downstream	2	2 , 3	1	1	2 , 3	2	1 , 2	1
4.1. Shelburne Impoundment	1	2 , 3	1	1	2 , 3	2	1 , 2	2
4.2. Shelburne Bypassed Reach	2	2 , 3	1	1	1 , 3	2	1 , 2	1
4.3 Shelburne Tailrace	2	2 , 3	1	1	2 , 3	2	1 , 2	2
4.4 Shelburne Downstream Reach	2	2 , 3	1	1	2 , 3	2	1 , 2	2



4. HYDROLOGY

There are two US Geological Survey (USGS) gages located upstream of the developments on the Androscoggin River:

- USGS gage 01053600 (GAGE1) located at Cambridge, New Hampshire. This gage has a contributing drainage area of 1,177 SQMI and contains recorded daily flows from October 1, 2008 to present day;
- USGS gage 01054000 (GAGE2) located near Gorham, New Hampshire. This gage has a contributing drainage area of 1,361 SQMI and contains recorded daily flows from October 1, 1913 to present.

4.1 Sawmill Results

Given the contribution drainage area above Sawmill is 1,337.8 SQMI, GAGE2 flows can be used to prorate the inflow at Sawmill by multiplying the GAGE2 daily flows by the drainage area ratio (DAR) of Sawmill's drainage area by the GAGE2 drainage area (1,337.8/1,361 or 0.983). Based on this approach, the minimum daily flow of 767 CFS occurred on September 4, 2015. The maximum daily flow of 19,659 CFS occurred on June 18, 2017 and the average daily flow is 2,538 CFS.

Flow duration analyses indicate a daily flow of 1,549 CFS is exceeded about 90% of the time annually, a daily flow of 2,011 CFS is exceeded about 50% of the time annually, a daily flow of 3,902 CFS is exceeded about 10% of the time annually and a daily flow of 10,117 CFS is exceeded about 1% of the time annually.

Flow frequency analyses indicate the 10-year daily flow is about 15,804 CFS, the 50-year daily flow is about 19,340 CFS, and the 100-year daily flow is 20,640 CFS, while the 7Q10¹⁵ flow is 1,238 CFS.

4.2 Cross Results

Given the contribution drainage area above Cross is 1,358 SQMI, GAGE2 flows can be used to prorate the inflow at Cross by multiplying the GAGE2 daily flows by the DAR of Cross's drainage area by the GAGE2 drainage area (1,358/1,361 or 0.998). Based on this approach, the minimum daily flow of 778 CFS occurred on September 4, 2015. The maximum daily flow of 19,956 CFS occurred on June 18, 2017. The average daily flow is 2,573 CFS.

Flow duration analyses indicate a daily flow of 1,572 CFS is exceeded about 90% of the time annually, a daily flow of 2,041 CFS is exceeded about 50% of the time annually, a daily flow of 3,961 CFS is exceeded about 10% of the time annually and a daily flow of 10,178 CFS is exceeded about 1% of the time annually.

Flow frequency analyses indicate the 10-year daily flow is about 16,043 CFS, the 50-year daily flow is about 19,632 CFS, and the 100-year daily flow is 20,952 CFS, while the 7Q10 flow is 1,256 CFS.

¹⁵ 7Q10 – This frequency parameter estimates the seven day rolling average streamflow that is exceeded about 90 percent of the time. There is only a 10 percent chance that a seven day rolling average flow will be less than this value.



4.3 Upper Gorham Results

Given the contribution drainage area above Upper Gorham is 1,372 SQMI, GAGE2 flows can be used to prorate the inflow at Upper Gorham by multiplying the GAGE2 daily flows by the DAR of Upper Gorham's drainage area by the GAGE2 drainage area (1,372/1,361 or 1.008). Based on this approach, the minimum daily flow of 786 CFS occurred on September 4, 2015. The maximum daily flow of 20,162 CFS occurred on June 18, 2017. The average daily flow is 2,603 CFS.

Flow duration analyses indicate a daily flow of 1,589 CFS is exceeded about 90% of the time annually, a daily flow of 2,062 CFS is exceeded about 50% of the time annually, a daily flow of 4,002 CFS is exceeded about 10% of the time annually and a daily flow of 10,283 CFS is exceeded about 1% of the time annually.

Flow frequency analyses indicate the 10-year daily flow is about 16,208 CFS, the 50-year daily flow is about 19,834 CFS, and the 100-year daily flow is 21,168 CFS, while the 7Q10 flow is 1,269 CFS.

4.4 Shelburne Results

Given the contribution drainage area above Shelburne is 1,494 SQMI, GAGE2 flows can be used to prorate the inflow at Shelburne by multiplying the GAGE2 daily flows by the DAR of Shelburne's drainage area by the GAGE2 drainage area (1,494/1,361 or 1.098). Based on this approach, the minimum daily flow of 856 CFS occurred on September 4, 2015. The maximum daily flow of 21,954 CFS occurred on June 18, 2017. The average daily flow is 2,834 CFS.

Flow duration analyses indicate a daily flow of 1,573 CFS is exceeded about 90% of the time annually, a daily flow of 2,043 CFS is exceeded about 50% of the time annually, a daily flow of 3,961 CFS is exceeded about 10% of the time annually and a daily flow of 10,170 CFS is exceeded about 1% of the time annually.

Flow frequency analyses indicate the 10-year daily flow is about 17,649 CFS, the 50-year daily flow is about 21,598 CFS, and the 100-year daily flow is 23,050 CFS, while the 7Q10 flow is 1,382 CFS.

5. HYDROELECTRIC DESCRIPTIONS

The four Projects are owned by GLHA and are located in northern New Hampshire, Coos County along an 11-mile reach of the Androscoggin River that stretches from the City of Berlin, south to the Town of Shelburne.

5.1 Sawmill Description

Sawmill operates in a quasi-run-of-river (ROR) mode that allows the impoundment to fluctuate over a 6-inch range from a normal operating elevations (NOL) of 1094.5 feet mean sea level (FTMSL) to a minimum elevation of 1094.0 FTMSL. At the NOL the impoundment has a surface area of 72.5 acres, a gross storage volume of 620 acre feet (ACFT) and a usable storage capacity of about 36 ACFT.

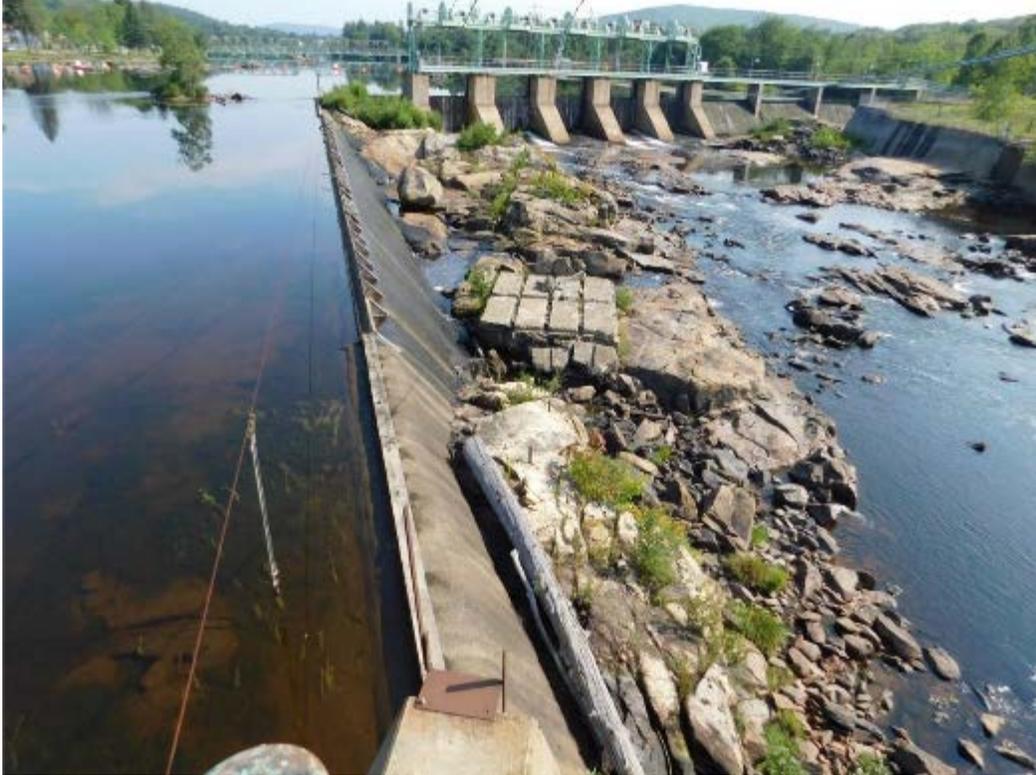


Sawmill (latitude 44°28.366'N, longitude 71°10.514' W) consists of:

- The Sawmill dam originally constructed in 1903 and refurbished in 1965. The dam is 720 feet long with a maximum height of 15 feet and is comprised of:
 - A 135-foot long non-overflow section with crest elevation of 1094.7 FTMSL;
 - A 169-foot long concrete section varying in height from 6 to 14 feet with a crest elevation of 1,094.5 FTMSL feet.
 - A 134-foot long waste gate section with five wooden gates each 22 feet high;
 - A 137-foot long spillway section with a crest elevation of 1087.0 FTMSL, with hinged 7.5-foot flashboards;
 - A 145-foot long by 11-foot high spillway with crest elevation of 1092.75 FTMSL and 21-inch steel flashboards;
- A 4-foot wide, 80-foot long concrete retaining wall on the east riverbank that separates the bypass reach from the powerhouse intake canal;
- A 4-foot wide, 55-foot long retaining wall extending from the edge of the powerhouse on the west riverbank;
- A 360-foot long intake canal that directs inflows through a steel penstock to the powerhouse;
- The powerhouse is a 115-foot by 65-foot by 27-foot brick and block structure that is integral to the dam and contains:
 - Four turbine inlet bays 14 feet wide by 19 feet long. Each bay passes flow through 14-foot wide by 19-foot high trashracks with 3-inch clear spacing.
 - Four identical horizontal generators connected to turbines using speed increasers. Each generator is rated at 888 kilovolt amps (kVA). At an overall power factor of 0.894, the total generator output is 3,174 kW;
 - Four horizontal tube turbines. Turbines 1 and 3 are Allis-Chalmers fixed blade propeller turbines having a maximum hydraulic capacity of 590 CFS and maximum output of 1,083 horsepower (HP) or 808 kilowatts (kW). Turbines 2 and 4 are adjustable blade propeller units with a maximum hydraulic capacity of 652 CFS and a maximum output of 1,177 HP or 878 kW. The maximum hydraulic capacity is 2,484 CFS with a maximum total output of the powerhouse at 3,174 kW when all four turbines are running.
- A 3,750-kVA transformer located approximately 25 feet to the west of the powerhouse and an 1,800-foot long transmission line.



Figure 8. Sawmill Waste Gates, Spillway and Bypassed Reach



5.2 Cross Description

Cross operates in a quasi-ROR mode that allows the impoundment to fluctuate over a 6-inch range from a NOL of 921.7 FTMSL to a minimum elevation of 921.2 FTMSL. At the NOL the impoundment has a surface area of 22 acres, a gross storage volume of 120 ACFT and a usable storage capacity of about 10 ACFT.

Cross (latitude 44°27.397' N, longitude 71°11.111' W) consists of:

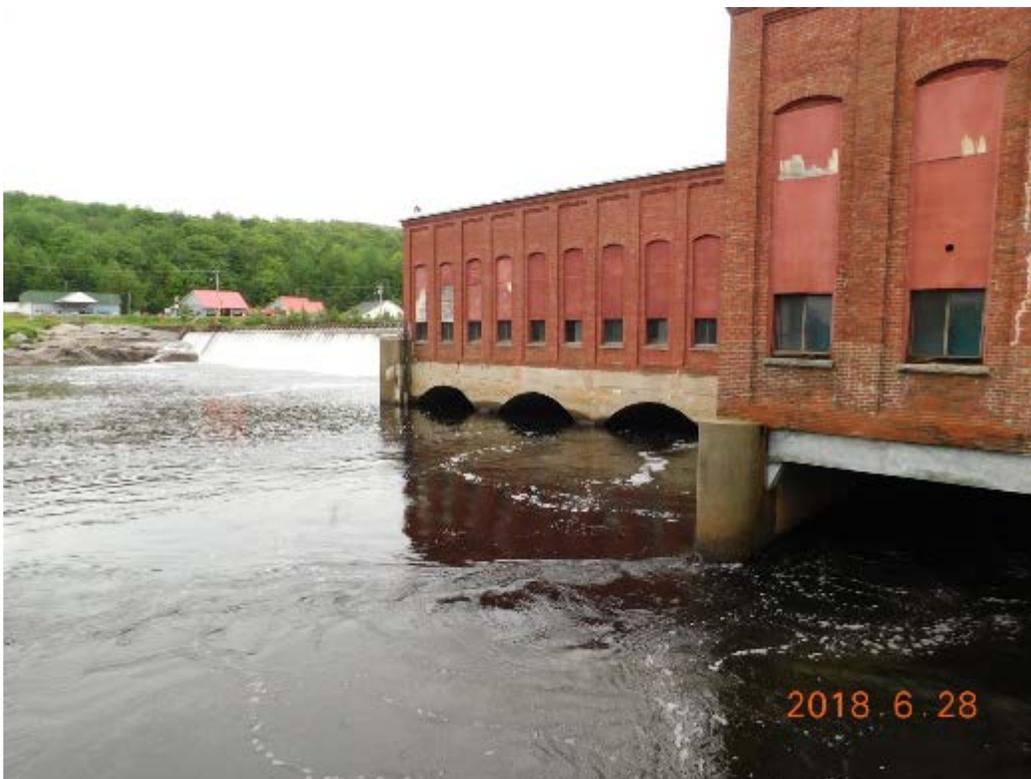
- The Cross dam originally constructed in 1903. The dam is 566 feet long with a maximum height of 20 feet and is comprised of:
 - Concrete non-overflow sections adjoined to a ledge outcropping. One section contains a stop-log opening used to pass accumulated debris. The other section is located from the outcropping to the spillway;
 - A 276-foot long spillway section with a crest elevation that varies from 918.2 to 921.7 FTMSL with newly designed 42-inch high flashboards to be installed in the fall of 2020 as approved by FERC on August 18, 2018¹⁶;
 - A gatehouse 19 feet wide by 124 feet long with five bays. Each bay contains trashracks 21.6 feet wide by 18.4 feet-high with 3-inch clear spacing;
 - A concrete retaining wall extending from the gatehouse to the river embankment;

¹⁶ <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=15001940>



- A powerhouse 44 feet downstream of the gatehouse. The powerhouse is a concrete substructure with brick superstructure that measures 47 feet by 146 feet, with an addition on the downstream shore side that measures 50 feet by 47 feet that contains:
 - Five horizontal generators. Generators 1 through 3 are rated at 750 kVA, Generator 4 is rated at 700 kVA and Generator 5 is rated at 900 kVA. At an overall power factor of 0.835, the total generator output is 3,220 kW;
 - Five horizontal propeller turbines. Turbines 1, 3 and 4 operate over a hydraulic range from 275 to 550 CFS. The maximum turbine output is 950 HP or 708 kW. Turbine 2 operates over a hydraulic range from 275 to 600 CFS with a maximum turbine output of 950 HP or 708 kW. Turbine 5 operates over a hydraulic range from 320 to 640 CFS with a maximum turbine output of 1,160 HP or 865 kW. The maximum hydraulic capacity is 2,890 CFS and the maximum total output of the powerhouse is 3,220 kW when all five turbines are running.
- A 3,750-kVA transformer and a 20-foot transmission line located adjacent to the powerhouse.

Figure 1 – Downstream View of Cross Tailrace, Powerhouse and Spillway





5.3 Upper Gorham Description

Upper Gorham operates in a quasi-ROR mode that allows the impoundment to fluctuate over a 6-inch range from a NOL of 812.3 FTMSL to a minimum elevation of 811.7 FTMSL. At the NOL the impoundment has a surface area of 45 acres, a gross storage volume of 370 ACFT and a usable storage capacity of about 22 ACFT.

Upper Gorham (latitude 44°23.984' N, longitude 71°11.390' W) consists of:

- The Upper Gorham dam originally constructed in 1904. The dam is 775 feet long with a maximum height of 31 feet and is comprised of:
 - A 133-foot long earthen dike with a concrete core wall and a crest elevation of 820.0 FTMSL;
 - A 300-foot long by 18-foot high rock-filled and timber-crib spillway section with a crest elevation of 807.3 FTMSL with 5 foot high flashboards;
 - A 122-foot long power canal head gate section, topped with a gatehouse 113 feet long by 16 feet wide, with a sill elevation of 795.0 FTMSL, having eight operable and two inoperable stop-log gates, each approximately 7.5 feet wide with trashracks having 3 1/8-inch clear spacing;
 - A 220-foot long earthen dike with a concrete core wall and a crest elevation of 820.0 FTMSL;
- A 3,350-foot long, 100-foot wide and 18-foot deep power canal;
- A brick and steel powerhouse 26 feet high by 74 feet wide by 127 feet long that contains:
 - Four horizontal generators, each rated at 1,500 kVA operated at a power factor of 0.8 (1,200 kW);
 - Four horizontal Francis turbines, each operating with a maximum hydraulic capacity of 550 CFS and a maximum turbine output of 1,600 HP or 1,193 kW. The maximum hydraulic capacity is 2,200 CFS and the maximum total output of the powerhouse is 4,800 kW when all four turbines are running;
- A 50-foot 22 kV transmission line located adjacent to the powerhouse.



Figure 2. Upper Gorham Spillway



Figure 11. Upper Gorham Powerhouse and Tailrace





5.4 Shelburne Description

Shelburne operates in a quasi-ROR mode that allows the impoundment to fluctuate over a 6-inch range from a NOL of 734.2 FTMSL to a minimum elevation of 733.7 FTMSL. At the NOL the impoundment has a surface area of 250 acres, a gross storage capacity of 2,000 ACFT and a usable storage capacity of about 100 ACFT.

Shelburne (latitude 44°24.211' N, longitude 71°6.906' W) consists of:

- The Shelburne dam originally constructed in 1903. The dam is 551 feet long with a maximum height of 17.5 feet and is comprised of:
 - Non-overflow dam sections totaling 146 feet in length;
 - A 171-foot long spillway with a crest elevation of 724.4 FTMSL. The spillway has an 83-foot long section topped by 9-foot high flashboards and an 88-foot section containing three 25-foot wide waste gates;
 - A 27-foot wide sluiceway adjacent to the waste gates, controlled by a 19-foot wide sluice gate.
 - A 17-foot long by 14-foot wide building housing the gate controllers located on the island adjacent to the sluiceway wall.
 - A 95-foot long concrete retaining wall located between the sluiceway and the powerhouse;
 - A powerhouse constructed by brick and steel framing on top of nine 4-foot wide concrete piers, each integral with the dam. The upstream face of the powerhouse is flush with the upstream face of the dam. The powerhouse measures 112 feet long by 49 feet wide and contains:
 - A 15-foot deep by 112-foot long intake with 3-inch clear spacing trashracks;
 - Three vertical generators. Generator 1 and 2 is rated at 1,200 kVA operated at a power factor of 0.8 (960 kW). Generator 3 is rated at 2,250 kVA operated at a power factor of 0.8 (1,800 kW);
 - Three vertical Francis turbines. Turbines 1 and 2 operate at a rated hydraulic flow of 800 CFS. The rated turbine output is 1,200 HP or 895 kW. Turbine 3 operates at a rated hydraulic flow of 1,800 CFS. The rated turbine output is 2,500 HP or 1,864 kW. The maximum hydraulic capacity is 3,400 CFS and the maximum total output of the powerhouse is 3,720 kW when all three turbines are running;
- A 5.5-mile long, 22-kV transmission line located adjacent to the powerhouse.

Recent new major infrastructure includes:

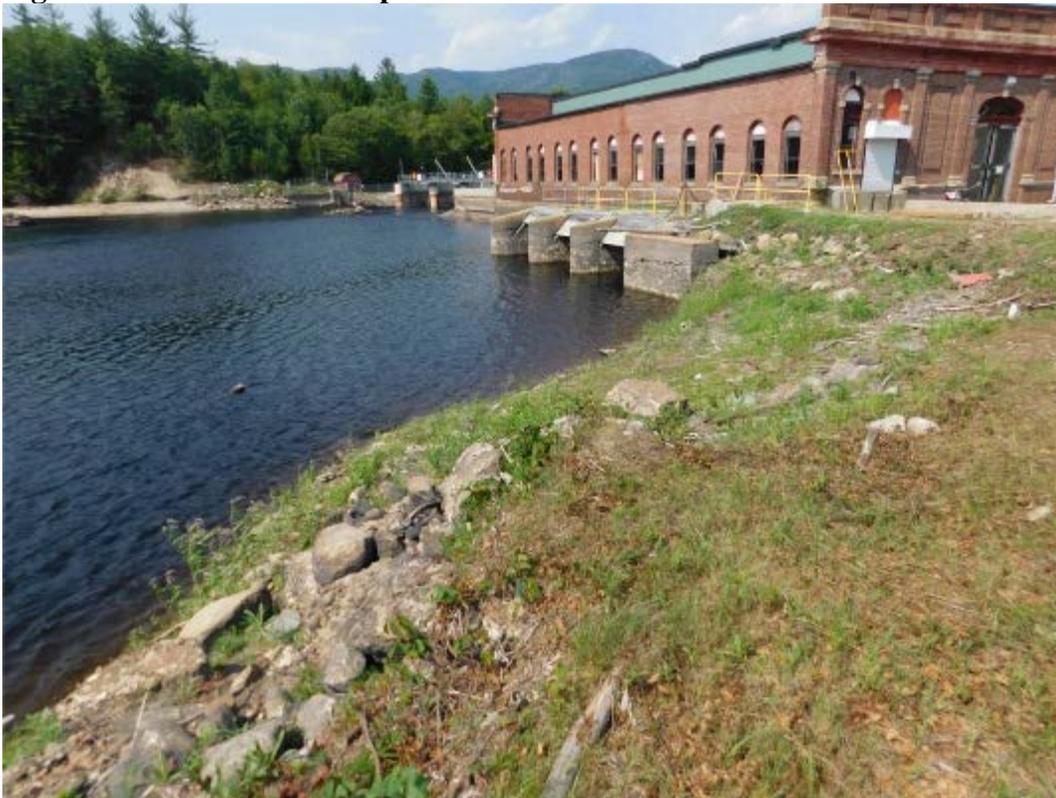
- A new winch for tripping dam installed in 2019; resurfacing of the spillway in 2019, and addition of a Programmable Logic Controller (PLC) for remote winch control in 2020.



Figure 3 - Shelburne Entrance to Sluiceway, Waste Gates and Spillway



Figure 13 - Shelburne Headpond and Powerhouse





6. REGULATORY SUMMARY

FERC licensed Sawmill, Cross, Upper Gorham and Shelburne to JRNHE under separate 30-year licenses each issued on August 1, 1994 and expiring on July 31, 2024. JRNHE was subsequently renamed to ATNHE. On June 3, 2002¹⁷, ATNHE and GNE jointly submitted an application to transfer license ownership to GNE after a bankruptcy sale of ATNHE to GNE. On August 12, 2002¹⁸, GNE filed notice of changing its name to GLHA. All four Projects are currently owned by GLHA which is a subsidiary of BRP.

In a July 12, 2019 filing, GLHA requested that the license termination date for their Riverside Project (FERC No. 2423) be accelerated to coincide with these four Projects. On July 31, 2019, GLHA filed notices of intent (NOIs) to file an application for new licenses and filed a Pre-Application Document (PAD) for these four Projects, the Riverside Project and the Cascade Project (FERC No. 2327).¹⁹ The PAD was prepared addressing all six projects. GLHA is not proposing any significant changes to existing operations and has selected FERC’s Integrated Licensing Process (ILP) for relicensing.

Assuming LIHI certification is recommended for any of these Projects, the relicensing process will be ongoing during the LIHI certification period. Based on the PAD schedule, the first year of studies began in June of 2020, with a recreation study and any needed second year of studies starting in May of 2021.

The WQCs for all four Projects were issued by the NH Department of Environmental Services (NHDES) more than ten years ago. Typically, LIHI certification review requires the agency to reaffirm the WQCs are still relevant. However, given that the relicensing process is ongoing, I can accept that resource agencies are reluctant to comment, as NHDES has stated for other LIHI applications undergoing relicensing when NHDES has requested relicensing studies related to the WQCs.

On May 6, 2020, GLHA filed a Revised Study Plan (RSP) with FERC ²⁰ that contains a schedule of the commencement and completion of all field work planned. (See Table 3).

Table 3 – Dates for Start and Completion of Field Work		
STUDY	START DATE	END DATE
Water Quality and Bypass Reach Minimum Flow Confirmation Study	Jul 2020	Oct 2020
Botanical Reconnaissance Level Study	Jun 2020	Oct 2020
Recreation Use and Facility Assessment Study	May 2021	Sep 2021
Historical Architectural Survey	Jun 2020	Dec 2020
Mussel Survey	Jun 2020	Sep 2020
Fish Entrainment Modeling	No field work anticipated	

Any recommendation for LIHI certification will be conditioned on GLHA providing updates to LIHI on the ongoing status of project relicensing, including FERC filings, resource agency consultation, prescriptions and recommendations, and agency comments on study results.

¹⁷ <https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=1011183:1>
¹⁸ <https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=10716935>
¹⁹ PAD - <https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=15318795>
²⁰ RSP - <https://elibrary.ferc.gov/elibrary/filedownload?fileid=15529252>



6.1 Sawmill License

Sawmill²¹ is licensed as FERC Project No. 2422. The WQC was issued on December 18, 1991²².

6.1.1 Licensing Articles

The license contains eight articles:

- Article 401 - Operate Sawmill in a ROR mode for the protection of fish and wildlife resources and water quality.
- Article 402 - Release a minimum flow of 12 CFS or inflow, whichever is less, into the bypassed reach for the protection and enhancement of fish and wildlife resources and water quality.
- Article 403 – Develop a plan to monitor ROR operation and minimum flows and describe how flows will be maintained when the impoundment is refilled after any maintenance and/or repairs.
- Article 404 – Construct, operate, and maintain any fishways that might be prescribed by the US Department of the Interior (USDOI) or (USFWS).
- Article 405 – Develop a water quality monitoring plan (WQMP) to monitor dissolved oxygen (DO) levels and temperature of the Androscoggin River upstream and downstream of Sawmill.
- Article 406 - Implement provisions of the Programmatic Agreement (PA).
- Article 407 - Develop a recreation plan (RP).
- Article 408 - Provides GLHA authority to:
 - Grant permission for certain types of use and occupancy of the project lands and waters
 - Convey certain interests in project lands and waters for certain types of use and occupancy, without prior FERC approval.

6.1.2 License Compliance

My review found ten ROR/minimum flow deviations that have occurred at the Sawmill Project over the last 15 years. These deviations were mostly due to conditions beyond operator control (e.g., weather, equipment malfunction, or upstream or downstream project operational disruptions) and typically lasted for short durations with no observed adverse environmental effects or public inquires or concerns. GLHA consistently notified the resource agencies as required by the license.

6.2 Cross License

Cross²³ is licensed as FERC Project No. 2326. The WQC was issued on December 13, 1991²⁴.

6.2.1 Licensing Articles

The license contains seven articles:

- Article 401 - Operate Cross in a ROR mode for the protection of fish and wildlife resources and water quality.

²¹ FERC license - <https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13711044>

²² Appendix A, page A-2

²³ FERC license - <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=12148393>

²⁴ Appendix A, page A-5



- Article 402 – Develop a plan to monitor ROR operation and describe how flows will be maintained when the impoundment is refilled after any maintenance and/or repairs.
- Article 403 – Construct, operate, and maintain any fishways that might be prescribed by the USDOJ or USFWS.
- Article 404 – Develop a WQMP to monitor DO levels and temperature of the Androscoggin River upstream and downstream of Cross.
- Article 405 - Implement provisions of the PA.
- Article 406 - Develop a RP.
- Article 407 - Provides GLHA authority to:
 - Grant permission for certain types of use and occupancy of the project lands and waters
 - Convey certain interests in project lands and waters for certain types of use and occupancy, without prior FERC approval.

6.2.2 License Compliance

My review found eight ROR/minimum flow deviations that have occurred at the Cross Project over the last 15 years. These deviations were all beyond operator control and typically lasted for short durations with no observed adverse environmental effects or public inquires or concerns. GLHA consistently notified the resource agencies as required by the license. It seems some of the unplanned incidences could be automatically resolved by installing a PLC, as was done at the Shelburne Project in 2020.

6.3 Upper Gorham License

Upper Gorham²⁵ is licensed as FERC Project No. 2311. The WQC was issued on October 26, 1993²⁶.

6.3.1 Licensing Articles

The license contains eleven articles:

- Article 401 - Operate Upper Gorham in a ROR mode for the protection of fish and wildlife resources and water quality.
- Article 402 - Release a minimum flow of 400 CFS from March 1 to June 15, and 200 CFS from June 16 to February 28, or inflow whichever is less, into the bypassed reach for the protection and enhancement of fish and wildlife resources and water quality.
- Article 403 – Develop a plan to monitor ROR operation and minimum flows and describe how flows will be maintained when the impoundment is refilled after any maintenance and/or repairs.
- Article 404 – Construct, operate, and maintain any fishways that might be prescribed by the USDOJ or USFWS.
- Article 405 – Develop a WQMP plan to monitor DO levels and temperature of the Androscoggin River upstream and downstream of Upper Gorham.
- Article 406 – Provide functional design drawings of a trashrack and downstream fish bypass facility to reduce the entrainment of resident fish, together with a schedule to construct/install the facilities before operation of the Upper Gorham.
- Article 407 - Implement provisions of the PA.

²⁵ FERC license - <https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13711045>

²⁶ Appendix A, page A-8



- Article 408 - Develop a RP.
- Article 409 - Develop an aesthetic enhancement plan (AEP).
- Article 410 – Develop a shoreline protection/management plan (SMP).
- Article 411 - Provides GLHA authority to:
 - Grant permission for certain types of use and occupancy of the project lands and waters
 - Convey certain interests in project lands and waters for certain types of use and occupancy, without prior FERC approval.

6.3.2 License Compliance

My review found one ROR/minimum flow deviation that occurred at the Upper Gorham Project in the last 15 years. The ROR deviation was due to equipment malfunction and lasted less than two hours with no observed adverse environmental effects or public inquires or concerns.

6.4 Shelburne License

Shelburne²⁷ is licensed as FERC Project No. 2300. The WQC was issued on December 13, 1991²⁸.

6.4.1 Licensing Articles

The license contains ten articles:

- Article 401 - Operate Shelburne in a ROR mode for the protection of fish and wildlife resources and water quality.
- Article 402 - Release a minimum flow equal to the existing leakage flow, estimated at no more than 2 CFS or inflow, whichever is less, into the bypassed reach for the protection and enhancement of fish and wildlife resources and water quality.
- Article 403 – Develop a plan to monitor ROR operation and minimum flows and describe how flows will be maintained when the impoundment is refilled after any maintenance and/or repairs.
- Article 404 – Develop a WQMP to monitor DO levels and temperature of the Androscoggin River upstream and downstream of Shelburne.
- Article 405 – Construct, operate, and maintain any fishways that might be prescribed by the USDOJ or USFWS.
- Article 406 – Develop a wetland monitoring and mitigation plan (WMMP).
- Article 407 - Implement provisions of the PA.
- Article 408 - Develop a RP.
- Article 409 – Develop a SMP.
- Article 410 - Provides GLHA authority to:
 - Grant permission for certain types of use and occupancy of the project lands and waters
 - Convey certain interests in project lands and waters for certain types of use and occupancy, without prior FERC approval.

²⁷ FERC license - <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13711041>

²⁸ Appendix A, page A-11



6.4.2 License Compliance

My review found six ROR/minimum flow deviations that have occurred at the Shelburne Project over the last 15 years. These deviations were all beyond operator control and typically for approximate one-hour durations with no observed adverse environmental effects or public inquires or concerns. GLHA consistently notified the resource agencies as required by the license.

7. LIHI CERTIFICATION PROCESS

GLHA submitted an application for LIHI certification on April 17, 2020. On June 30, 2020, LIHI notified GLHA that the intake review for the Project was complete. The intake review found that a revised application was needed. GLHA supplied a revised application on August 13, 2020 and LIHI posted the application for public comment. The 60-day public comment period ended on October 12, 2020.

7.1 Comment Letters

On August 13, 2020, LIHI filed notice on their email list that the public comment period for the application had been opened. No comments were received during the comment period which ended on October 12, 2020.

7.2 Agency Correspondence

On August 13, 2020, LIHI emailed contacts²⁹ listed in the Project application as knowledgeable about the Project. Given that the revised application provided all supporting documentation and no other apparent issues were uncovered in my review, I did not reach out to any resource agencies.

8. CERTIFICATION REVIEW

This section contains my review of the Projects with regard to the LIHI Certification criteria. As part of my review, I conducted FERC e-library searches to verify claims in the application. My review concentrated on the period since GLHA acquired the Projects on June 3, 2002 through October of 2020 for FERC docket numbers P-2422, P-2326, P-2311 and P-2300.

Given that these Projects are separated by other hydroelectric sites on the river between them and since these four Projects are licensed separately, each Project is being reviewed individually below.

²⁹ Gregg.Comtock@des.nh.gov; Ted.Walsh@des.nh.gov; mprout@fs.fed.us; Carol.Henderson@wildlife.nh.gov; DIANNE.TIMMINS@WILDLIFE.NH.GOV; Amy.Lamb@dncr.nh.gov; julianne_rosset@fws.gov; sean.mcdermott@noaa.gov; kevin_mendik@NPS.gov



8.1 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.

Inflow to the Projects is regulated by five large storage reservoirs at the headwaters of the Androscoggin River system: Lake Umbagog, Rangeley Lake, Mooselookmeguntic Lake, Richardson Lakes (Upper and Lower), and Aziscohos Lake. The Errol Hydroelectric Project impounds Lake Umbagog and serves as the release point for the upper storage reservoirs in the Androscoggin River basin.

The Errol Project operates in accordance with a 1983 ARHBA³⁰. FERC approved the ARHBA³¹ on June 30, 1992. The ARHBA states the Errol dam will release a volume of at least 1,550 cubic feet per second per day (CFSD) provided:

- Volume releases from Aziscohos Lake into the Magalloway River are sufficient to provide at least one-third of the annual volume release at the Errol dam. The Magalloway River joins the Androscoggin River just upstream of the Errol Dam;
- In the judgement of the Engineering Committee³² sufficient volume is in the upstream storage ponds to furnish and maintain the 1,550 CFSD at Berlin; and
- Any party to the agreement requests in writing that the 1,550 CFSD be released and discharged.

The ARHBA requires all hydroelectric projects that benefit from the flow regulation to reimburse the water storage reservoir owner's annual operations and maintenance costs.

8.1.1 Sawmill

Sawmill satisfies the LIHI flows criterion in ZOE 1.1 (impoundment) and ZOE 1.3 (tailrace) by meeting alternative standard A-1, and in ZOE 1.2 (bypassed reach) by meeting alternative standard A-2.

Sawmill operates in a quasi-ROR mode that allows the impoundment to fluctuate over a 6-inch range from a NOL of 1094.5 FTMSL to a minimum elevation of 1094.0 FTMSL, and that releases a minimum flow of 12 CFS or inflow, whichever is less, into the bypassed reach.

According to the November 1993 Final Environmental Impact Statement (EIS)³³, the minimum flow was established by evaluating the Sawmill Project fishery resources and habitat in the bypassed reach via a fish survey and a minimum flow study, which evaluated the effects of alternative flows on fishery habitat. The study concluded:

- Salmonids reside in the bypassed reach as a result of downstream movement from upstream;
- No salmonid spawning habitat was observed in the bypass reach;
- Salmonid habitat in the bypassed reach is inconsistently suitable; and
- The 12 CFS minimum flow release provides a passage flow for downstream moving salmonids.

³⁰ Appendix A – page A-14

³¹ Appendix A, page A-36

³² Engineering Committee consists of five members, each representing a hydro owner on the Androscoggin River.

³³ EIS - <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=165045>



Given the overall lack of salmonid habitat, the NHDES and USFWS both concurred with the 12 CFS minimum flow (See page 81 of the EIS).

Excess inflow above the powerhouse maximum capacity of 3,074 CFS is passed into the bypassed reach, which occurs about 15 percent of the time annually. License Article 403 required a Minimum Flow Monitoring Plan (MFMP). The plan was approved by FERC order on September 24, 1997³⁴.

ROR operation or minimum flows may be temporarily modified if required by operating emergencies beyond the control of the licensee, and for short periods upon mutual agreement between GLHA, USFWS and NHDES. As previously discussed, since GLHA acquired ownership of the Project, ten ROR deviations have occurred, and appropriate notifications were made. None were found to be a license violation by FERC.

8.1.2 Cross

Cross satisfies the LIHI flows criterion in ZOE 2.1 (impoundment) by meeting alternative standard A-1, and in ZOE 2.2 (bypass reach) by meeting alternative standard A-2.

Cross operates in a quasi-ROR mode that allows the impoundment to fluctuate over a 6-inch range from a NOL of 921.7 FTMSL to a minimum elevation of 921.2 FTMSL. Since the bypass reach is very short (0.1 miles) and the powerhouse is essentially integral to the dam and the backwater of the downstream Cascade Project, no minimum flow release is specified for the bypassed reach. Excess inflow above the powerhouse maximum capacity of 2,890 CFS is passed over the spillway, which occurs about 20 percent of the time annually. License Article 403 required a Run-of-River monitoring plan (RORMP), which was approved by FERC on September 16, 1997³⁵.

ROR operation may be temporarily modified if required by operating emergencies beyond the control of the licensee, and for short periods upon mutual agreement between GLHA, USFWS and NHDES. As previously discussed, since GLHA acquired ownership of the Project, eight ROR deviations have occurred, and appropriate notifications were made. None were found to be a license violation by FERC.

8.1.3 Upper Gorham

Upper Gorham satisfies the LIHI flows criterion in ZOE 3.1 (impoundment) by meeting alternative standard A-1, and in ZOE 3.2 (bypass reach), ZOE 3.3 (tailrace) and ZOE 3.4 (downstream reach) by meeting alternative standard A-2.

Upper Gorham operates in a quasi-ROR mode that allows the impoundment to fluctuate over a 6-inch range from a NOL of 812.3 FTMSL to a minimum elevation of 811.7 FTMSL, and releases a minimum flow of 400 CFS into the bypass reach throughout the trout spawning season (March 1 to June 15) to optimize rainbow trout and brook trout habitat. For the remainder of the year (June 16 to February 28), due to increased demand in angler activity, the prior minimum flow 50 CFS was increased to 200 CFS, or inflow, whichever is less, into the bypassed reach. (See page 130 of EIS). The minimum flow was based on fish surveys and Instream Flow Incremental Methodology (IFIM) study conducted for relicensing.

³⁴ MFMP - <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=3096168>

³⁵RORMP - <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=3095161>



Excess inflow above the powerhouse maximum capacity of 2,200 CFS is passed into the bypassed reach, which occurs about 43 percent of the time annually. License Article 403 required a MFMP. The plan was approved by FERC order on July 24, 1995³⁶.

ROR operation or minimum flows may be temporarily modified if required by operating emergencies beyond the control of the licensee, and for short periods upon mutual agreement between GLHA, USFWS and NHDES. As previously discussed, since GLHA acquired ownership of the Project, one ROR deviation occurred, and appropriate notifications were made. This event was not found to be a license violation by FERC.

8.1.4 Shelburne

Shelburne satisfies the LIHI flows criterion in ZOE 4.1 (impoundment) by meeting alternative standard A-1, and in ZOE 4.2 (bypass reach), ZOE 4.3 (tailrace) and ZOE 4.4 (downstream reach) by meeting alternative standard A-2.

Shelburne operates in a quasi-ROR mode that allows the impoundment to fluctuate over a 6-inch range from a NOL of 734.2 FTMSL to a minimum elevation of 733.7 FTMSL, and that releases a minimum flow of 2 CFS or inflow, whichever is less, into the bypassed reach which is short, about 150 feet long. The 2 CFS approximates the leakage flow that occurred prior to the relicensing of the Project. No agencies requested evaluation of alternative minimum flows at the time of relicensing. NH Fish and Game Department (NHFG) stated at the time that the “bypassed reach consists of bedrock and ledge and thus is not valuable as fish habitat.”

Excess inflow above the powerhouse maximum capacity of 3,400 CFS is passed into the bypassed reach, which occurs about 17 percent of the time annually. License Article 403 required a MFMP. The plan was approved by FERC on September 24, 1997³⁷.

ROR operation or minimum flows may be temporarily modified if required by operating emergencies beyond the control of the licensee, and for short periods upon mutual agreement between GLHA, USFWS and NHDES. As previously discussed, since GLHA acquired ownership of the Project, six ROR deviations have occurred, and appropriate notifications were made. Of these, none were found to be a license violation by FERC.

8.1.5 Summary

Although some deviations of ROR operation/minimum flow releases have occurred since GLHA acquired ownership of the Projects, all were of relatively short duration and resulted in no reported environmental impact. None were found to be license violations by FERC. GLHA’s follow-up actions and implementation of measures were deemed by FERC to help prevent further such occurrences.

As part of GLHA’s RSP, a minimum flow confirmation study is scheduled to be completed in October of 2020. Once completed and approved by resource agencies and FERC, the study should be supplied to LIHI.

³⁶ MFMP - <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=3018052>

³⁷ MFMP - <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=3096164>



My review indicates that GLHA has proactively operated the Project impoundments in a ROR mode and provided required minimum flows which were established using science-based methods. It is my recommendation that the Projects all satisfy the flow criterion at this time, pending the relicensing study results and any resultant flow changes.

8.2 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 application states that the LIHI water quality criterion in all ZOE's of all Projects is satisfied by meeting alternative standard B-2. The WQCs for all four projects were issued by the state resource agency more than ten years ago. Typically, LIHI certification review requires the agency to reaffirm the WQCs are still relevant if Standard B-2 is selected. However, given that the relicensing process is ongoing, I can accept that NHDES is reluctant to comment as they have expressed to LIHI for other projects in relicensing. Therefore, the more appropriate Standard is B-3, site-specific studies.

The Androscoggin River located in the vicinity of the Projects is classified as Class B by the NHDES. Class B waters are considered acceptable for fishing, swimming and other recreational purposes, and, after adequate treatment, for use as water supply. Regulations for Class B waters include:

- no disposal of sewage or waste unless it has received adequate treatment to prevent the lowering of the physical, chemical, biological, or bacteriological characteristics;
- no disposal of sewage or waste that is harmful to aquatic life, and;
- all surface waters shall be free from substances that:
 - Settle to form harmful benthic deposits;
 - Float as foam, debris, scum or other visible substances;
 - Produce odor, color, taste or turbidity that is not naturally occurring and would render the surface water unsuitable for its designated uses;
 - Result in the dominance of nuisance species, or;
 - Interfere with recreational activities.

The Projects meet all water quality standards for Class B waters pursuant to their WQCs.

On November 22, 1996, FERC approved a modified WQMP for Shelburne.³⁸ On December 3, 1996, FERC approved a modified WQMP for Sawmill³⁹, a modified WQMP for Cross⁴⁰ and a modified WQMP for Upper Gorham.⁴¹

On June 16, 1998⁴², a summary report of results of the 1995-1997 WQMP study for all Projects was submitted to FERC. The report compared the 1995-1997 results to results previously prepared and reviewed by the FERC during relicensing of the Projects, concluding that the sampling results confirm that no

³⁸ WQMP - <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=3061835>

³⁹ WQMP - <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=3062632>

⁴⁰ WQMP - <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=3062626>

⁴¹ WQMP - <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=3062634>

⁴² <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=53664>



violations of Class B DO standards are likely to occur in this stretch of the river under current pollution loads and project operation.

On September 9, 1998, FERC acknowledged receipt of the WQMP report.⁴³ The FERC stated that, “... *the NHDES agrees that no further quality monitoring was necessary at the Shelburne Project unless the reservoir elevation is increased, at which time 3 years of additional study would be required. The Shelburne Project was referenced specifically by the NHDES because monitoring at that project was in its water quality permit ... in a September 2, 1998 telephone conversation between NHDES and FERC staff, the NHDES indicated that it supported cessation of monitoring, unless minimum flows or effluent discharges changed ... in a March 31, 1998 letter, the USFWS agreed that further evaluation would only be necessary if project operations change the minimum flows in the river or if waste loads increased ...*” FERC indicated that water quality monitoring for all Projects could be suspended.

In the 2018 NHDES draft impaired waters list⁴⁴, the Androscoggin River upstream and downstream of the Projects’ vicinity is listed as impaired due to prior discharges from several paper mills. Given the ROR operations with limited impoundment fluctuations of 6 inches, it is unlikely that the Projects affect the river’s water quality.

As part of GLHA’s RSP, a water quality study was scheduled to be completed in October of 2020. Once completed, the study should be supplied to LIHI. In my review, no water quality issues were found, the Projects do not appear to adversely affect water quality, and it is my recommendation that all Projects satisfy the water quality criterion at this time, pending the relicensing study results and any resultant water quality mitigation.

8.3 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 populations in areas affected by the Project’s facilities.

The application states that the LIHI upstream fish passage criterion in all ZOE’s of all Projects is satisfied by meeting alternative standard C-1.

There are no upstream fish passage facilities in this reach of the Androscoggin River. Diadromous species such as alewife, blueback herring, striped bass, sea lamprey, and American shad are not present given that the downstream Lewiston Falls in Lewiston, Maine is impassable to these species. The Rumford Falls in Rumford, Maine (a natural waterfall, not to be confused with the hydropower facility of the same name), which is also downstream of the Projects, is impassable to Atlantic salmon.

The USFWS has stated: “... *American eel, a catadromous fish species, are present in the lower Androscoggin River downstream of Lewiston Falls in relatively low numbers as compared to other watersheds in Maine ... No American eels were collected in the upper Androscoggin River during fish sampling studies historically conducted in the Project areas (Yoder et al. 2006) ...*”

⁴³ <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=77469>

⁴⁴ <https://www.des.nh.gov/organization/divisions/water/wmb/swga/2018/index.htm>



The National Marine Fisheries Service (NMFS) 2009 Biological valuation of Atlantic salmon habitat within the Gulf of Maine Distinct Population Segment⁴⁵ stated:

- On page 7, “... *The following impassable falls delimit the upstream extent of the freshwater range: Rumford Falls in the town of Rumford on the Androscoggin River ...*”;
- On page 76, “... *In 1987, the Pejepscot Hydropower Project, the second dam on the Androscoggin River, installed both upstream and downstream fish passage. In 1988, Worumbo installed upstream and downstream passage at the Worumbo Project, the third upstream dam on the river. This provided an opportunity for anadromous species to migrate upstream as far as Lewiston Falls ...*”;
- On page 75, “... *the upper extent of fish passage in the Androscoggin River is Lewiston Falls ...*”
- On page 72, “... *In the Androscoggin watershed, Rumford Falls is the upper extent of Atlantic salmon migration, while Lewiston Falls is believed to be the upper extent of alewife and shad migrations ...*”;
- In their 2013 interim final rule opinion⁴⁶, “... *The current Gulf of Maine Distinct Population Segment (GOM DPS) of Atlantic salmon includes all anadromous Atlantic salmon whose freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River, and wherever these fish occur in the estuarine and marine environment ... The Rumford Falls in the town of Rumford on the Androscoggin River is impassable falls and defines the upstream extent of the freshwater range ...*”.

The Appalachian Mountain Club (AMC) Ecological Atlas of the Upper Androscoggin River Watershed⁴⁷ states on page 61, “... *that the Androscoggin River in the vicinity of the Projects supports approximately 30 species of resident fish, a quarter of which are non-native ...*”. The upper Androscoggin River throughout Maine and New Hampshire supports cold-water trout and landlocked salmon. Angling for salmonids is bolstered by trout stocking and wild reproduction in the upper watershed and tributaries. Flow from tributaries and regulated water releases from upper storage reservoirs (e.g., Umbagog, Aziscohos, and Richardson) enhances cold-water fisheries habitat in the main stem of the Androscoggin River.

Fish sampling studies indicated that the overall catch was dominated by common fish species of the northeastern United States, including fallfish (30.6%), smallmouth bass (26.3%), white sucker (14.9%), longnose dace (10.7%), common shiner (6.4%) and spot-tail shiner (4.2%). Other species, such as rainbow trout, bullhead, and yellow perch were less common (< 2%).

Smallmouth bass and white sucker were most common in riverine segments; smallmouth bass and fallfish were most common in the impounded segments (Yoder et al. 2006). NHFG does not have a formal, published fisheries management plan for the upper Androscoggin River, however, they stock the river annually with brook trout, rainbow trout, and brown trout to support a put and take fishery approximately 10 miles upstream of the Sawmill Project.

My review found no current issues pertaining to upstream fish passage. No agencies have requested upstream passage studies as part of the current relicensing. It is my recommendation that all Projects satisfy the upstream fish passage criterion.

⁴⁵ http://cybrary.fomb.org/ESA/20090000_NOOA_Bio_val_Atlantic_salmon_habitat_GOM_Distinct_Population_Segment.pdf

⁴⁶ <https://www.federalregister.gov/documents/2013/11/19/2013-27734/endangered-and-threatened-species-protective-regulations-for-the-gulf-of-maine-distinct-population>

⁴⁷ <https://www.outdoors.org/wp-content/uploads/pdf/Ecological-Atlas-of-the-Upper-Androscoggin-River-Watershed.pdf>



8.4 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. Migratory species can successfully complete their life cycles and maintain healthy populations in areas affected by the facility.

The application states that the LIHI downstream fish passage criterion in all ZOE's of all Projects is satisfied by meeting alternative standard D-1.

There are no diadromous, anadromous or catadromous fish species in this section of the Androscoggin River, since no upstream nor downstream fish passage facilities for migratory species exist upstream of the Lewiston Dam. Resident species may make their way into the various Project impoundments in times of spill. The Projects are operated with limited drawdowns for the protection of aquatic resources and agency-recommended minimum bypass reach flows are in place to safeguard resident fish species.

Functional designs of downstream fish bypass facilities at CRP's Gorham Project (FERC No. 2519, LIHI #153) and GLHA's Upper Gorham Project, including plans for operations and maintenance were required under each license's article 406. However, FERC terminated that requirement upon appeal, by an order issued January 9, 2003, citing that the license burdens were not justified by the limited public benefit⁴⁸. The original basis for requiring these passages was contained in recommendations proposed by the Department of Interior (on behalf of USFWS). The recommendation was premised on the eventual addition of a new development ("Pulsifer Rips") upstream of GLHA's Upper Gorham impoundment which would create a significantly enhanced salmonid habitat in a 1.5-mile bypassed reach. FERC noted that the potential of this addition was a key decision driver for the fish passage requirement for both projects. Prior to those proceedings, New Hampshire maintained an active fish stocking effort (trout and landlocked Atlantic salmon) upstream of the two projects, and studies showed that transient salmonids would reside in the Berlin-Shelburne area (just upstream of Gorham). However, the proposal for Pulsifer Rips was eventually withdrawn, which led to a re-examination of the fish passage requirements for the downstream projects that had been proposed. FERC determined that the minimum flow requirements should provide adequate passage through spillage, and deleted Article 406 (those requiring passage) from the two project licenses. However, Upper Gorham's Article 404 remains and reserves authority for FERC to require fish passage in the future as the Interior Department may prescribe pursuant to Section 18 of the Federal Power Act.

As a result, there are currently no special downstream fish passage structures in this reach of the upper Androscoggin River occupied by the Projects. Downstream passage can occur by means of spillway flow, low-level gate releases and power intake flow through the trashracks, pipelines and turbines. Maintenance work and drawdowns at each dam is planned in consultation with the local resource agencies. The Projects do not appear to adversely impact the successful completion of resident fish life cycles or result in significant levels of entrainment. As part of GLHA's RSP, a fish entrainment modeling effort is scheduled to be completed as part of relicensing.

⁴⁸ The reason for the delay between the time the re-licensing went into effect and the termination of order was because FERC determined these specific recommendations could wait until an Environmental Assessment was completed for upstream projects, which were also going through re-licensing at that time.



My review found no current issues pertaining to downstream fish passage. It is my recommendation that all Projects satisfy the downstream fish passage criterion at this time, pending the relicensing study results and any resultant entrainment mitigation.

8.5 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 or enhance environmental conditions of soils, vegetation, and ecosystem functions on shoreline and watershed lands associated with the facility.

The NH Comprehensive Shoreland Protection Act was enacted into law in 1991. In 2011, the act was renamed the Shoreland Water Quality Protection Act (SWQPA). The SWQPA establishes minimum standards for the subdivision, use and development of shorelands adjacent to the state's public water bodies.

It includes limits on impervious surfaces, a provision for waterfront and natural woodland buffers in which vegetation removal is limited, shoreland protection, and the establishment of a permit requirement for many new construction, excavation and filling activities within the Protected Shoreland.

Given that the SWQPA applies to the entire Androscoggin River, I believe the alternative standard E-3 should apply to all ZOE's for all Projects rather than standard E-1 or E-2 as selected by the Applicant.

8.5.1 Sawmill

No SMP is required for Sawmill. The Project's ROR operation and limited impoundment fluctuations provides protection for the Project's shoreline areas.

The Sawmill Project is located on the northern edge of the City of Berlin. The east shoreline of the impoundment is bordered by sand and gravel terraces, most of which have been altered by industrial, commercial, and residential development, as well as railroad and bridge construction. The east shoreline of the impoundment is also characterized by low terraces and was altered by the railroad yard, railroad bed, mill yards, and commercial and residential development. Lands within the Project boundary are limited to the immediate shoreline and only those lands required for Project operations.

My review found no issues pertaining to shoreline and watershed protection. It is my recommendation that Sawmill satisfies the shoreline and watershed protection criterion.

8.5.2 Cross

No SMP is required for Cross. The Project's ROR operation and limited impoundment fluctuation provides protection for the Project's shoreline areas. Lands within the Project boundary are limited to the immediate shoreline and only those lands required for Project operations. The Project lands within the bypass reach are minimal as the powerhouse is essentially integral to the dam.

My review found no issues pertaining to shoreline and watershed protection. It is my recommendation that Cross satisfies the shoreline and watershed protection criterion.



8.5.3 Upper Gorham

A Shoreline Protection Plan (SPP) was developed for the Upper Gorham Project. The SPP was filed on August 1, 1995⁴⁹ and supplemented by letter on May 12, 2000⁵⁰. The SPP adopted the provisions in the New Hampshire Comprehensive Shoreline Protection Act (now referred to as the NH Shoreland Water Quality Protection Act). The Act lists uses of the shoreline within a 250-foot buffer that are permitted, prohibited, or restricted and establishes planting and vegetation removal standards within any existing woodland buffer. On July 5, 2000, the FERC issued an order modifying and approving the SPP.⁵¹

Lands within the Project boundary are limited to the immediate shoreline and only those lands required for Project operations and recreation facilities. The Project's ROR operation provides protection for the Project's shoreline areas.

My review found no issues pertaining to shoreline and watershed protection. It is my recommendation that Upper Gorham satisfies the shoreline and watershed protection criterion.

8.5.4 Shelburne

A SPP was developed for Shelburne Project. The SPP was filed on August 1, 1995⁵² and supplemented by letter on May 12, 2000⁵³. The SPP adopted the provisions in the New Hampshire Shoreland Act. The Act lists uses of the shoreline within a 250-foot buffer that are permitted, prohibited, or restricted and establishes planting and vegetation removal standards within any existing woodland buffer. On July 5, 2000, the FERC issued an order modifying and approving the SPP.⁵⁴

Lands within the Project boundary are limited to the immediate shoreline and only those lands required for Project operations and recreation facilities. The Project's ROR operation provides protection for the Project's shoreline areas.

8.5.5 Conclusion

My review found no issues pertaining to shoreline and watershed protection. It is my recommendation that Shelburne satisfies the shoreline and watershed protection criterion.

8.6 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 is satisfied in all ZOE's for all Projects by meeting alternative standard F-2.

⁴⁹ <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=10676440>

⁵⁰ <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=8069959>

⁵¹ SPP - <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=3195362>

⁵² <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=10676440>

⁵³ <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=8069959>

⁵⁴ SPP - <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=3195362>



There are no federally-listed critical habitats within the Project areas. No documented federally endangered or threatened aquatic species are listed in this reach of the Androscoggin River. The USFWS Species Lists obtained using the Information for Planning and Consultation (IPaC) project planning tool⁵⁵ identified the Canada lynx and the Northern long-eared bat as threatened mammal species that may occur in the Project areas. It is believed that the Projects have no effect on the bat species, as there are generally no tree-clearing activities or corridor maintenance activities. Minor mowing and brush removal on the canals and dam abutments may occur but typically trees with a basal diameter less than 4 inches would be expected to be removed and no significant tracts of forested lands occur within the Project boundaries. Furthermore, northern New Hampshire is only considered supporting landscape for Canada lynx, so it is unlikely the species would use the Project areas for anything other than transient purposes.

Migratory birds of particular concern on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in the project area include:

- Bald Eagle - Breeds from December 1 to August 31;
- Cape May Warbler – Breeds from June 1 to Jul 31;
- Evening Grosbeak – Breeds from May 15 to August 10;
- Rusty Blackbird – Breeds from May 10 to July 20, and;
- Wood Thrush – Breeds from May 10 to August 31.

Game species lists and fact sheets in the New Hampshire Wildlife Action Plan (NHwap)⁵⁶ include four state-endangered bat species within the Project areas: Eastern small-footed bat, little brown bat, tri-colored bat, and the federally threatened Northern long-eared bat. No state-listed fish or mussel species were identified occurring in the Project areas.

The July 2020 NH Natural Heritage Bureau's (NHNHB) Rare Plants, Rare Animals, and Exemplary Natural Communities in New Hampshire Towns Report⁵⁷ (RPRAR), on page 34 for the town of Berlin, NH, includes American marten, rusty blackbird and wood turtle as species of special concern. Canada lynx, Northern long-eared bat and common nighthawk are listed as endangered species. The common loon is listed as a state-threatened species.

On page 110 of the RPRAR for the town of Gorham, NH, bald eagle and the smooth green snake are listed as species of special concern. There are five bald eagle nests documented on the upper Androscoggin River within or adjacent to the Project areas. The Northern long-eared bat and the bat hibernaculum are listed as state-endangered. Routine Project operations are not anticipated to affect threatened or endangered bats. There may be periodic vegetation clearing for dam safety, access, and other purposes but these would be conducted in accordance with the Section 4(d) rule using the USFWS streamlined consultation process. As such, no negative effects are anticipated by this periodic activity.

The peregrine falcon is listed as a threatened species. Peregrine falcon was first reported in 2015 near the Upper Gorham Project and in 2018, two nests were recorded outside of the Project boundary, however no chicks fledged.

⁵⁵ <https://ecos.fws.gov/ipac/location/GXK2ILKRG5BUFEWARMSP7URJE/resources>

⁵⁶ <https://wildlife.state.nh.us/wildlife/species-list.html>

⁵⁷ <https://www.nh.gov/nhdfi/documents/town-lists.pdf>



While eagles are no longer listed under the Endangered Species Act (ESA), they continue to be protected under the federal Bald Eagle and Golden Eagle Protection Act (BEGEPA) as well as other federal laws and are legally protected in New Hampshire as a species of special concern.

The RPRAP identified the following endangered rare plants that have the potential to occur in the vicinities of the Projects: auricled twayblade, mountain sweet-cicely, ovoid spikesedge, parasol sedge, pink shinleaf, purple virgin's-bower, round-leaved orchid and smooth cliff fern. Similarly, the following threatened rare plants identified are dwarf blueberry, fragrant wood fern, heart-leaved twayblade and Hornemann's willow-herb.

The NHNHB has identified an exemplary sugar maple-silver maple-white ash floodplain forest between the Upper Gorham and Shelburne Projects, one of only two documented floodplain forests of this type in New Hampshire. Portions of this natural community are described as having evident disturbance and patchy distribution of invasive species while records indicate that to the east “is a typical, non-disturbed patch of high terrace floodplain forest” as reported by Amy Lamb⁵⁸, Ecological Information Specialist with the NHNHB. These areas are outside of the Project boundaries.

The NHDES lists the brook floater mussel as endangered although it is not known to be present in the Project areas. As part of relicensing, a Botanical Reconnaissance Level Study is expected to be completed in October 2020. Also, a mussel survey was scheduled for completion in September of 2020. These completed reports when available should be supplied to LIHI. It is my recommendation that the threatened and endangered species protection criterion is satisfied for all Projects at this time, pending the relicensing study results and any resultant species mitigation.

8.7 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 application states the LIHI cultural and historic resources criterion in all ZOE’s for all Projects is satisfied by meeting alternative standard G-1, since there are no known archeological sites within the Project boundaries, no features within the Project areas are listed on the National Register of Historic Places, and the state of New Hampshire’s Division of Historical Resources has not listed any of the sites in the State Register of Historic Places.

However, since all four Projects were required to develop Programmatic Agreements (PA) in consultation with the state’s Historic Preservation Officer (SHPO), I believe the alternative standard should be defined by satisfying standard G-2. The PA was issued by FERC on September 14, 1993.⁵⁹

On August 8, 1996, FERC issued an amended PA⁶⁰ for the Projects that changed the annual monitoring report filing date for the year to January 1 of the next year (i.e. 1996 monitoring report filed on January 1, 1997). On January 2, 2020, the latest 2019 annual monitoring report was filed summarizing repair and improvement activities that occurred at the affected Projects during 2019 and notifications to the SHPO of

⁵⁸ Amy Lamb – 603-271-2834 - Amy.Lamb@dred.nh

⁵⁹ PA - <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=10431388>

⁶⁰ Amended PA - <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=3051327>



scheduled activities for 2020.⁶¹ GLHA has proactively consulted with resource agencies pertaining to cultural and historical issues and is compliant with related license requirements.

A Historical Architectural Survey is scheduled to be completed in December of 2020. The study report should be sent to LIHI once complete. It is my recommendation that all Projects satisfy the cultural and historic resources protection criterion at this time, pending the relicensing study results and any resultant resource mitigation.

8.8 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.

8.8.1 Sawmill

The Applicant states the LIHI recreation criterion in ZOE 1.1 and ZOE 1.3 is satisfied by meeting alternative standard H-2, and in ZOE 1.2 (bypass reach) by satisfying alternative standard H-1.

A Recreation Plan (RP) was approved by FERC on February 13, 1997.⁶² There are no licensee managed recreation facilities at the Sawmill Project. However, several recreation facilities are located nearby:

- Service Credit Union Heritage Park, also known as Northern Forest Heritage Park (Heritage Park), is located immediately to the west of the Sawmill dam and is managed by the Androscoggin Valley Chamber of Commerce, with support from public and private groups such as Service Credit Union, to sponsor recreational events throughout the year. The park was established in 1994 as part of a 12-acre land donation from JRNHE. Heritage Park hosts river tours, cultural events, concerts and holiday parties as well as special events such as logging competitions. In 1997, JRNHE also donated the Company House to Heritage Park;
- Rotary Park, located adjacent to the Sawmill impoundment, provides access via the shoreline and is operated and maintained by the City of Berlin. Rotary Park was part of the 12-acres of land donated by JRNHE;
- Centennial Park, located on the Sawmill impoundment, provides access via a single lane boat launch. This site has one Americans with Disabilities Act (ADA) compliant parking space and a seasonally installed ADA compliant temporary restroom facility. The site is operated by the City of Berlin.

Improvements made in the mid-1990s at Rotary Park as outlined in the RP are in the process of being removed and redesigned as part of the City of Berlin's new Riverwalk. Heritage Park, Centennial Park and Rotary Park are not currently part of the Project lands. On December 12, 2019, GLHA requested an extension of time to submit the redesign documents.⁶³

GLHA is required to include these redesigned facilities in the Project boundary and to file a revised Exhibit

⁶¹ <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=15434812>

⁶² RP - <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=3069961>

⁶³ <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=15423488>



G reflecting these changes. These recreation facilities, however, are located on property not owned nor maintained by GLHA. Discussions with the City of Berlin regarding this requirement have been ongoing since 2016. GLHA has offered to replace the amenities in kind and has discussed incorporating only those features into the Project boundary. A meeting was held on January 10, 2019 with the City of Berlin to discuss replacing the previously installed amenities and inclusion of said amenities in the Project boundary. Following the meeting, the city of Berlin submitted to GLHA a proposal for contributions to the Riverwalk Project for new amenities including kayak ramps and overlooks. By letter dated, July 30, 2019, GLHA once again reiterated its commitment to replacing in kind the amenities to be replaced by the revitalization of Rotary Park.

On July 31, 2019, the relicensing of the Berlin Projects, including the Sawmill Project, commenced with the filing of the PAD and NOI. Scoping meetings were held on October 22, 2019. Based on comments received on the PAD and garnered during the scoping meetings, recreation is among the issues anticipated to be addressed during the relicensing effort. As such, GLHA is seeking an extension of time to fulfill the above requirement through the relicensing effort which will address the broader recreation facilities and needs throughout the region. On January 17, 2020, FERC granted the time extension until July 31, 2022.⁶⁴

On January 7, 2020, GLHA and CRP filed a combined proposed recreation study plan (PRSP).⁶⁵ On February 6, 2020 GLHA and CRP met to discuss the PRSP. On February 20, 2020, GLHA and FERC discussed the plan via phone. On March 16, 2020, GLHA filed a clarification memo with FERC clarifying issues.⁶⁶ Also, due to the ongoing Covid pandemic, a Recreational Use and Assessment Study has been rescheduled for completion in September of 2021. The study report should be sent to LIHI once completed.

GLHA ongoing efforts are in compliance with license recreational access, accommodation, and facility conditions. Therefore, it is my recommendation that the Project satisfies the recreational resources criterion at this time, pending the results of the relicensing recreation study and any resultant modifications or enhancements.

8.8.2 Cross

The Applicant states the LIHI recreation criterion in ZOE 2.1 is satisfied by meeting by standard H-2 and in ZOE 2.2 by standard H-1.

However, a Recreation Plan (RP) was approved by FERC on February 13, 1997.⁶⁷ The RP required:

- Installing signs at the tailrace fishing area;
- Improve gatehouse appearance by cleaning up debris, installing new siding, painting, and roofing while maintaining historical integrity; and
- Completing Project facilities repairs by 2000.

Given that signage is required in the tailrace area, and all requirements were completed, the alternative standard for ZOE 2.2 is better satisfied as H-2.

⁶⁴ <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=15445217>

⁶⁵ PRSP - <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=15437801>

⁶⁶ <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=15485009>

⁶⁷ RP - <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=3069965>



GLHA is in compliance with the license recreational access, accommodation, and facility conditions. My review found no issues pertaining to recreational resources and where allowed, access is provided without fees. Therefore, it is my recommendation that the Project satisfies the recreational resources criterion at this time, pending the results of the relicensing recreation study and any resultant modifications or enhancements.

8.8.3 Upper Gorham

The Applicant states the LIHI recreation criterion in ZOE 3.1 and ZOE 3.3 is satisfied by meeting alternative standard H-2, and in ZOE 3.2 and ZOE 3.4 by meeting alternative standard H-1.

A Recreation Plan (RP) was approved by FERC on February 13, 1997.⁶⁸ The RP required:

- Formally designate public access, provide signage, and provide barrier-free parking and signage at the AMC trailhead;
- Monitor recreation use every 5 years, starting in 2000, by means of the Licensed Hydropower Development Recreation Report (Form 80);
- Designate the AMC as the entity that would operate and maintain enhancements at the trailhead and parking lot;
- Develop Project facilities by 2000.

All facilities were subsequently completed. On October 19, 2012, GLHA submitted a request for approval of a recreational right-of-way conveyance for bicycle trails for the Project.⁶⁹

On November 29, 2012, FERC issued a notice granting a recreational right-of-way to Coos Cycling Club for the development and maintenance of a non-motorized bicycle trail at the Project.⁷⁰ FERC stated GLHA may convey the above interests in Project lands without prior FERC approval and that no further action is necessary.

On April 3, 2015, GLHA filed FERC's Form 80 with a description of the methodology used to estimate recreation data included in Recreation Reports.⁷¹

GLHA is in compliance with the license recreational access, accommodation, and facility conditions. My review found no issues pertaining to recreational resources and where allowed, access is provided without fees. Therefore, it is my recommendation that the Project satisfies the recreational resources criterion at this time, pending the results of the relicensing recreation study and any resultant modifications or enhancements.

⁶⁸ RP - <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=3069963>

⁶⁹ <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=13092703>

⁷⁰ <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=13118894>

⁷¹ <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=13828463>



8.8.4 Shelburne

The Applicant states the LIHI recreation criterion in ZOE 4.1, ZOE 4.3 and ZOE 4.4 is satisfied by meeting alternative standard H-2 and in ZOE 4.2 by meeting alternative standard H-1.

A Recreation Plan (RP) was approved by FERC on February 13, 1997.⁷² The RP required:

- Provide informational signage regarding the history of the project;
- Monitor recreation use every 5 years starting in 2000 by means of the Licensed Hydropower Development Recreation Report (Form 80);
- Develop signage and make aesthetic improvements by 2000;

All facilities were subsequently completed.

On July 17, 2006, FERC accepted GLHA's schedule for installation of the Shelburne historical signage.⁷³

On April 3, 2015, GLHA filed FERC's Form 80 with a description of the methodology used to estimate recreation data included in Recreation Reports.⁷⁴

GLHA is in compliance with the license recreational access, accommodation, and facility conditions. My review found no issues pertaining to recreational resources and where allowed, access is provided without fees. Therefore, it is my recommendation that the Project satisfies the recreational resources criterion at this time, pending the results of the relicensing recreation study and any resultant modifications or enhancements.

9. RECOMMENDATION

Given that the four Projects have other hydroelectric sites sporadically situated on the river between them and since these four developments are licensed separately, each development was reviewed individually.

9.1 Sawmill Project Recommendation

A review of the certification application and supporting documentation, and a search of the FERC docket shows that GLHA has successfully complied with the FERC license articles and other requirements. GLHA operates and maintains the Sawmill Project to support applicable environmental resources and the Project satisfies the LIHI criteria as discussed in the sections above. I recommend that the Sawmill Project be certified for a five (5) year term with the following conditions:

1. The facility Owner shall provide updates to LIHI on the ongoing status of Project relicensing, including studies, FERC filings, resource agency consultation, prescriptions and recommendations, and agency comments on study results. LIHI reserves the right to modify the Certificate or conditions based on the outcome of the relicensing.

⁷² RP - <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=3069967>

⁷³ <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=11087698>

⁷⁴ <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=13828463>



2. The facility Owner shall provide updates to LIHI on the ongoing status of the Proposed Recreation Plan including efforts with the City of Berlin's Riverwalk project.

9.2 Cross Project Recommendation

A review of the certification application and supporting documentation, and a search of the FERC docket shows that GLHA has successfully complied with the FERC license articles and other requirements. GLHA operates and maintains the Cross Project to support applicable environmental resources and the Project satisfies the LIHI criteria as discussed in the sections above. I recommend that the Cross Project be certified for a five (5) year term with the following condition:

1. The facility Owner shall provide updates to LIHI on the ongoing status of project relicensing, including studies, FERC filings, resource agency consultation, prescriptions and recommendations, and agency comments on study results. LIHI reserves the right to modify the Certificate or conditions based on the outcome of the relicensing.

9.3 Upper Gorham Project Recommendation

A review of the certification application and supporting documentation, and a search of the FERC docket shows that GLHA has successfully complied with the FERC license articles and other requirements. GLHA operates and maintains the Upper Gorham Project to support applicable environmental resources and the Project satisfies the LIHI criteria as discussed in the sections above. I recommend that the Upper Gorham Project be certified for a five (5) year term with the following condition:

1. The facility owner shall provide updates to LIHI on the ongoing status of project relicensing, including studies, FERC filings, resource agency consultation, prescriptions and recommendations, and agency comments on study results. LIHI reserves the right to modify the Certificate or conditions based on the outcome of the relicensing.

9.4 Shelburne Project Recommendation

A review of the certification application and supporting documentation, and a search of the FERC docket shows that GLHA has successfully complied with the FERC license articles and other requirements. GLHA operates and maintains the Shelburne Project to support applicable environmental resources and the Project satisfies the LIHI criteria as discussed in the sections above. I recommend that the Shelburne Project be certified for a five (5) year term with the following condition:

1. The facility owner shall provide updates to LIHI on the ongoing status of project relicensing, including studies, FERC filings, resource agency consultation, prescriptions and recommendations, and agency comments on study results. LIHI reserves the right to modify the Certificate or conditions based on the outcome of the relicensing.



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APPENDIX A DOCUMENTS