

REVIEW OF APPLICATION FOR RE-CERTIFICATION BY THE LOW IMPACT HYDROPOWER INSTITUTE OF THE ASHUELOT AND LOWER ROBERTSON HYDROELECTRIC PROJECTS, LIHI #46

Prepared by Stephen Byrne, Maryalice Fischer

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I. INTRODUCTION

This report summarizes the review findings of the application submitted by Ashuelot River Hydro Inc. (Applicant) to the Low Impact Hydropower Institute (LIHI) for re- certification of the Ashuelot and Lower Robertson Hydroelectric Projects FERC P-7791, P-8235 (Projects). The Projects were first Low Impact Certified by LIHI as Certificate #46 on November 20, 2009, effective June 24, 2009. The two Projects are located on the Ashuelot River in Winchester, NH, off Route 119 between the village of Ashuelot and the town of Hinsdale. Both Projects operate in a run-of-river mode.

Since the initial LIHI certification, the Projects were recertified on April 8, 2015, effective June 29, 2014. On June 11, 2019 LIHI received a complete application for Low Impact Recertification of the Projects. There have not been any material changes at either Project during the term of the previous Certification. However, there have been material changes in the LIHI Criteria and certification process since the Projects were last certified, in that an updated Certification Handbook has been published by LIHI. This current review was made using the new 2nd Edition LIHI Certification Handbook (Revision 2.03, December 20, 2018).

II. PROJECT'S GEOGRAPHIC LOCATION

The Lower Robertson Project is located beside Route 119 just downstream of the town of Ashuelot, while the Ashuelot Project is located at 80 Lost Road, an unmarked road off Route 119 about a mile downstream of the Lower Robertson Project (Figures 1-3). The Projects were built in 1985 by the same owner and have almost identical designs and equipment. The Ashuelot River has a 425 square mile drainage area, flowing from its headwaters in Pillsbury State Park steeply for the first 30 miles, then through the town of Gilsum and the city of Keene to join the Connecticut River below Hinsdale, NH (Figure 1). The headwaters are an important part of the drinking water supply for Keene and a key environmental resource for flora and fauna in the area. Dams upstream of the Projects include:

- Ashuelot Park Dam, owned by City of Keene;
- Surry Mountain Dam and Otter Brook Dam (U. S. Army Corp flood control dams upstream of Keene); and
- Nash Mill Dam, Marlow, FERC P-3309.

The Projects are sited in the lower 4.5 miles of the Ashuelot River. After passing the Lower Robertson dam and powerhouse, the Ashuelot River drops steadily for an undeveloped mile to the Ashuelot dam and powerhouse.

The river drops steadily for a half mile downstream of the Ashuelot dam, flattening out as it reaches the village of Hinsdale and the Fiske Mill dam which is the first dam on the river. There is little development for the first 3/4 mile, then bridges and streamside buildings in the town of Hinsdale. From Hinsdale, the Ashuelot River flows about 2 more miles to its confluence with the Connecticut River, which then flows south through Vermont, Massachusetts, and Connecticut, and into the Atlantic Ocean.

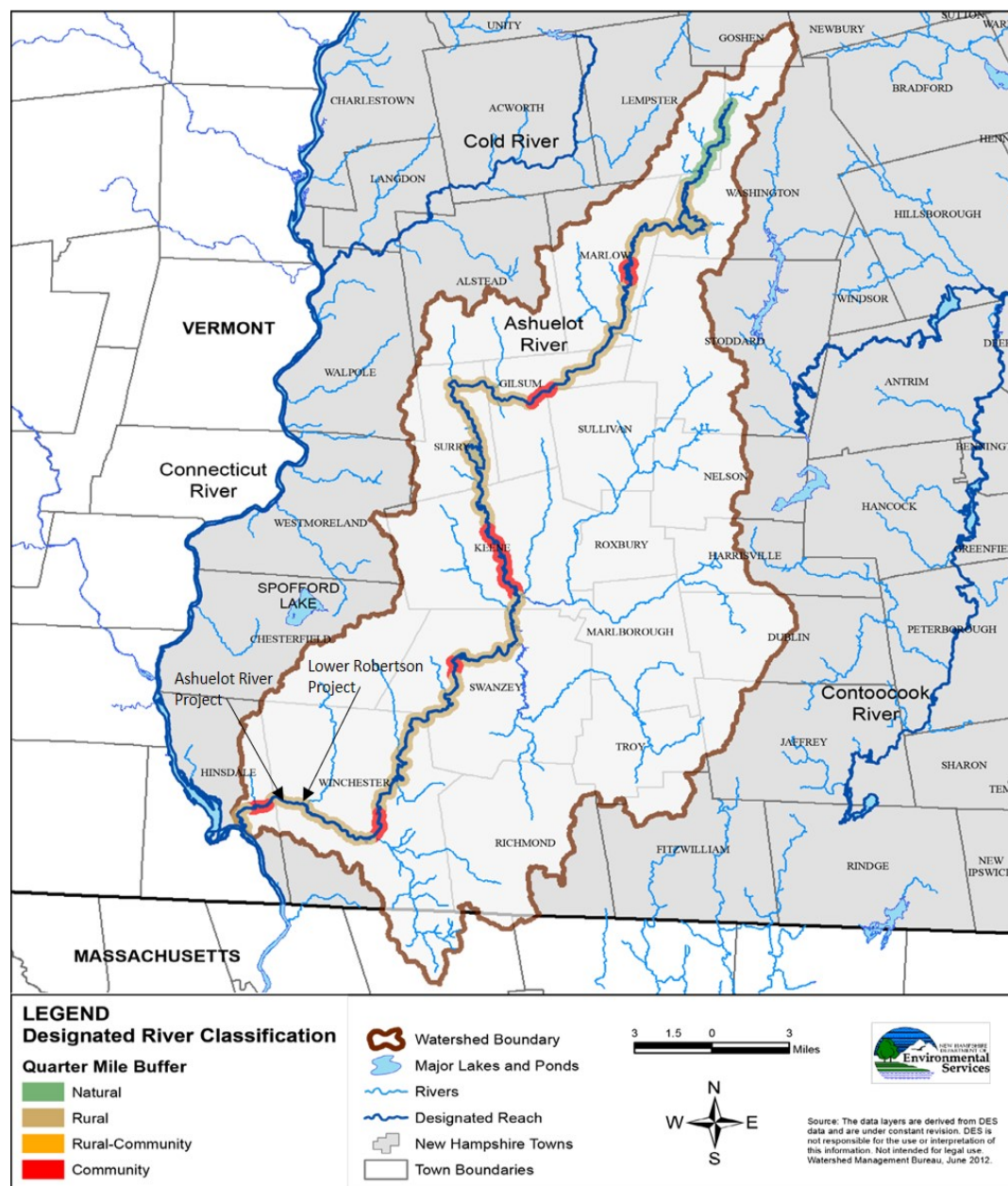


Figure 1 – Ashuelot River Watershed



Figure 2 – Lower Robertson Hydroelectric Project



Figure 3 – Ashuelot River Hydroelectric Project

III. PROJECT AND IMMEDIATE SITE CHARACTERISTICS

The Lower Robertson dam is approximately 125 feet long and 18 feet high with a spillway crest elevation of 384.6 feet mean sea level (msl). The Project has automated level control, which (with the Obermeyer crest gates raised) keeps the pond level at 386.6 ft msl during normal flows. There is a single pair of Obermeyer crest gates (16 feet wide by 6 feet tall) between the spillway and the intake structure. The Lower Robertson impoundment has a surface area of 8.6 acres. The Project intake structure, powerhouse, and tailrace are located at the north end of the dam. The powerhouse has three Flygt Kaplan turbine units with a total installed capacity of 840 kW. An informal portage trail exists along the left bank of the dam. Downstream fish passage was installed at the dam and has been operating since 1999. The passage facility consists of angled trash racks, a fish entrance below the trash racks, a collection box, and a discharge pipe in the tailrace. Additionally, bars are installed annually from April through October 15 on the trash racks reducing the spacing from 1 and 5/8th inch to 3/4 inch.

The Ashuelot dam is approximately 144.5 feet long and 18 feet high with a spillway crest elevation of 335.4 feet msl. The project has automated level control, which (with the Obermeyer crest gates raised) keeps the pond level at 339.6 ft msl during normal flows. There is a single set of Obermeyer crest gates along the top of the spillway. The Ashuelot impoundment has a surface area of 1.6 acres. The Project intake structure, powerhouse, and tailrace are located at the south end of the dam. The powerhouse has three Flygt Kaplan turbine units with a total installed capacity of 870 kW. A portage trail was built in 2010 and has been maintained since. Downstream fish passage was installed at the dam and has been operating since 2001. Similar to the passage facility at the Lower Robertson Project, the passage facility consists of angled trash racks, a fish entrance below the trash racks, a collection box, and a discharge pipe in the tailrace. Additionally, bars are installed annually from April through October 15 on the trash rack reducing the spacing from 1 and 5/8th inch to 3/4 inch.

IV. ZONES OF EFFECT AND STANDARDS SELECTED

Four Zones of Effect (ZOE) were designated by the Applicant and were determined to be appropriate. Their locations are shown in Figures 4 through 7.



Figure 4 – Zone of Effect 1 is at the Lower Robertson Project and defined by the Applicant as extending from the upstream start of the impoundment .22 river miles (354m) downstream to the dam.



Figure 5 – Zone of Effect 2 is at the Lower Robertson Project and defined by the Applicant as extending from the downstream side of the Lower Robertson dam .15 miles (235m), to the downstream limit.



Figure 6 – Zone of Effect 3 is at the Ashuelot Project and defined by the Applicant as extending from the upstream start of the impoundment .15 river miles (245m) to the upstream face of the dam.



Figure 7 – Zone of Effect 4 is at the Ashuelot Project and defined by the Applicant as extending from the downstream side of the dam .15 miles (240m), to the downstream limit.

The following tables show the Standards selected for each criterion for the four ZOE's. Where applicable, reviewer recommendations for alternate standards are shown in **red**.

ZOE #1 – Lower Robertson Project Impoundment

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	x		

ZOE #2 – Lower Robertson Project Downstream Reach

Criterion		<i>Alternative Standards</i>				
		<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>Plus</i>
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				x
F	Threatened and Endangered Species Protection	x				
G	Cultural and Historic Resources Protection		x			
H	Recreational Resources		x	x		

ZOE #3 – Ashuelot Project Impoundment

Criterion		<i>Alternative Standards</i>				
		<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>Plus</i>
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	x		

ZOE #4 – Ashuelot Project Downstream Reach

Criterion		<i>Alternative Standards</i>				
		<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>Plus</i>
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	x		

V. REGULATORY AND COMPLIANCE STATUS

FERC Exemption

The Projects were issued exemption orders from the licensing requirements of part I of the Federal Power Act by the Federal Energy Regulatory Commission (FERC) in 1986. The Applicant is required however, to adhere to the standard license articles listed in the two exemption orders (Appendix A of the application) and any mandatory terms and conditions filed by state and federal resource agencies.

Regulatory Compliance

A review of the FERC database from April 1, 2014 through June 17, 2019 indicates that the applicant has complied with the requirements of the exemption orders issued for the Projects.

VI. PUBLIC COMMENT RECEIVED OR SOLICITED BY LIHI

The deadline for submission of comments on the LIHI certification application was August 10, 2019. The Ashuelot River Local Advisory Committee (ARLAC) and the Connecticut River Conservancy (CRC) filed comment letters. On August 19, 2019 CRC submitted a correction to their comments in response to a LIHI staff inquiry on the condition of the Ashuelot River portage trail. The National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) untimely filed its comment letter after August 10, 2019; however, the agency did not object to recertification and specific comments are incorporated into this report. The Applicant submitted a letter response to comments on August 22, 2019. Comment letters and the response were posted on the Project's webpage.

Outreach was made by LIHI staff to NH Fish and Game (NHFG). The results of these communications are summarized in the applicable criteria sections.

Copies of the comment letters and email communications are included in Appendix A of this report.

VII. DETAILED CRITERIA REVIEW

A. ECOLOGICAL FLOW REGIMES

Goal: The flow regimes in riverine reaches that are affected by the facility support habitat and other conditions suitable for healthy fish and wildlife resources.

Assessment of Criterion Passage: The Applicant has appropriately selected Standard A-1, Not Applicable/De Minimis Effect for all four ZOE's.

Both Projects operate in a run-of-river mode and are fully automated. There are no bypassed reaches. Impoundment levels are therefore maintained within a few inches by a computer acting

on data from pressure transducers located in the impoundments. Plant updates (including impoundment levels) are automatically sent to the owner/operators twice a day, and alarm texts are immediately sent in the event of high or low water levels. In addition, a local operator visits and maintains the sites daily. In practice, impoundment levels stay very stable and reach higher levels when water flows exceed the turbine capacities, and lower levels only in extremely dry summer weather. During flood events both sites lower their Obermeyer crest gates, which helps to mitigate high water levels in the impoundments. The stable, automated impoundment level control during regular run-of-the-river operations protects the aquatic habitat and its inhabitants.

Article 2 of the FERC Exemptions requires adherence to conditions originally issued by New Hampshire Fish & Game (NHFG) and U.S. Fish and Wildlife Service (FWS) that stated: “*The exemptee shall provide an instantaneous minimum discharge below the project of at least 205 cfs (0.5 cfs/m) or inflow to the project, whichever is less, to protect downstream aquatic resources*”. At the behest of the Project owner of the time, FERC, NHFG, and FWS approved a stream flow gauging plan by orders dated November 1, 1994 (Ashuelot) and May 16, 1995 (Robertson). Under current ownership, the Projects are operated as run-of-river and in conformance with those orders and plans. Recent communication between the Applicant and FWS (provided with the application) indicates that the current minimum flow requirements remain in effect. NMFS commented that the agency supports continued run-of-river operation and the flow monitoring plan and made no recommendation for changes in minimum flow requirements.

Based on my review of the application, supporting documentation, input from agencies and stakeholders, and publicly available information, both Projects satisfy the Ecological Flow Regimes criterion.

The Projects Pass Criterion A – Ecological Flow Regimes

B. WATER QUALITY

Goal: Water Quality is protected in waterbodies directly affected by the facility, including downstream reaches, bypassed reaches, and impoundments above dams and diversions.

Assessment of Criterion Passage: The Applicant appropriately selected Standard B-3, Site-Specific Studies for all ZOE's.

In its letter dated March 5, 2019, the New Hampshire Department of Environmental Services (NHDES) informed the Applicant that in order for NHDES to issue a statement saying that the upstream and downstream reaches of the Ashuelot River at the Projects comply with New Hampshire water quality standards, NHDES would need new water quality data. In the same letter, NHDES recommended water quality parameters, monitoring locations, monitoring frequencies, and quality control practices for data collection. In its 2019 application for recertification to LIHI, the Applicant states that because the testing must be done during low flow conditions and the current LIHI certification expired in July 2019 (extended to September 30, 2019), the Applicant requests that LIHI recertify the sites pending acceptable water quality testing results, as was done in 2009-10 when monitoring results showed the Projects met state water quality standards, with the exception of naturally occurring low pH and at least one high *e*.

coli data point (see 2015 recertification review report). CRC deferred to NHDES on water quality matters. ARLAC commented that they “*see no impacts to water quality resulting from the operation of the dams at this time*”, and also deferred comment pending results of the 2019 monitoring.

A review of the Projects’ annual compliance letters to LIHI indicated that no violations in water quality criterion have occurred during the current Low Impact certification period.

Based on my review of the application, supporting documentation, input from agencies and stakeholders, and publicly available information, I believe the Projects satisfy with this criterion. However, since the next required monitoring would occur during a new LIHI Certification term, I am recommending that a condition be included to provide a copy of the monitoring data to LIHI once completed and NHDES approval of the results.

The Projects Conditionally Pass Criterion B – Water Quality

C. UPSTREAM FISH PASSAGE

Goal: The facility allows for the safe, timely, and effective upstream passage of migratory fish. This criterion is intended to ensure that migratory species can successfully complete their life cycles and maintain healthy, sustainable fish and wildlife resources in areas affected by the facility.

Assessment of Criterion Passage: The Applicant appropriately selected Standard C-1, Not Applicable/De Minimis Effect for ZOEs #1 and #3 (Project Impoundments); and Standard C-2 Agency Recommendation for ZOEs #2 and #4 (the Projects’ downstream reaches).

The Ashuelot River has been targeted for anadromous fish restoration. A dam downstream of the Project dams, known as Fiske Mill, installed upstream passage (a fish lift) in 2014. Diadromous species in the area include: American Eel (known to occur at low densities in the Ashuelot River), American Shad (750 are stocked in the river each year, and they are present in the mainstem Connecticut River upstream and downstream of the Ashuelot confluence, and currently the focus of restoration in the Ashuelot River), sea lamprey (known to spawn in the lower river and expected to use fishways to access habitat upstream), blueback herring (not currently present, limited by low passage numbers at the Holyoke dam, LIHI #89), but could be the focus of future restoration efforts), and Atlantic salmon (no longer under restoration or present in the watershed).

Zones #1 and #3 are the impoundments, and therefore the zones do not present a barrier to upstream fish passage. Regarding the Projects’ downstream reaches, the Applicant has formally agreed to construct upstream fish passage at the Ashuelot and Lower Robertson projects in accordance with triggers and schedules that are described in this excerpt from a July 12, 2006 FWS letter; “*within 2 years after 750 American shad are passed at the downstream Fiske Mill Dam or within 4 years after 150 shad pass, whichever comes first.*” FWS informed the Applicant in February 2019 that to date, this trigger has not been met. FWS noted that their expectation is that formal monitoring will be initiated in the near future at Fiske Mill and therefore, there should be better information relative to how many shad are passing Fiske Mill.

ARLAC commented that NHFG reports in their online NH Fish Survey Map that American eels are present upstream and downstream of the Ashuelot and Lower Robertson Dams and ARLAC stated that “*eel numbers have been greatly reduced upstream of dams constructed on North American rivers and streams over the past 300 years.*” As such, ARLAC recommended the Applicant construct ramps with wetted surfaces to enable eels to climb over the dams. ARLAC also noted that sea lamprey, a species of special conservation concern in New Hampshire were observed in 2019 by FWS downstream of the Fiske Mill Project.

CRC commented that although the downstream trigger mentioned above at the Fiske Mill Dam has not yet been met, riverine fishes would also benefit from being able to move between habitats upstream and downstream of the Ashuelot and Lower Robertson Dams, and that nothing precludes the Applicant from providing upstream passage now. NMFS commented that the Fiske Mill Project will initiate formal monitoring of upstream passage in 2020 and that the trigger number for these Projects may need reconsideration based on the better data. NHFG commented that the Projects are good candidates for upstream eel passage.

In its response to comments on eel passage, the Applicant stated that they continue to gain knowledge on fish and eel passage through touring the Silvio Conte Anadromous Fish Lab and discussing the latest designs for fish passage as well as identifying experts with whom to consult. Additionally, the Applicant, in coordination with the Massachusetts Department of Fish and Game is searching for consultants to aid in improving the existing eel passage at its hydro plant in West Springfield, MA, and lessons learned through those improvements would be helpful at the Ashuelot River Projects. NHFG noted that a FWS biologist in Nashua NH is an expert on eel passage design so this review recommends that the Applicant consult with that office on eelway design.

Based on my review of the application, supporting documentation, input from agencies and stakeholders, and publicly available information, upstream passage for American eels has not yet been formally requested by resource agencies, and both Projects satisfy the Upstream Fish Passage criterion. However, because American eel are present upstream and downstream of the Projects, the Applicant could apply for a Plus Standard for Criterion C if they choose to voluntarily install upstream eel passage at the Projects before being required to do so.

The Projects Pass Criterion C – Upstream Fish Passage

D. DOWNSTREAM FISH PASSAGE AND PROTECTION

Goal: The facility allows for the safe, timely, and effective downstream passage of migratory fish. For riverine (resident) fish, the facility minimizes loss of fish from reservoirs and upstream river reaches affected by Facility operations. All migratory species are able to successfully complete their life cycles and to maintain healthy, sustainable fish and wildlife resources in the areas affected by the Facility.

Assessment of Criterion Passage: The Applicant appropriately selected Standard D-2 Agency Recommendation for ZOE #1 and #3 (the Project impoundments) and Standard D-1, Not Applicable/De Minimis Effect for ZOE #2 and #4.

The following fish species have been captured during various fish surveys in the lower Ashuelot River: American eel, common white sucker, longnose dace, smallmouth bass, tessellated darter, bluegill sunfish, common sunfish (pumpkinseed), redbreast sunfish, yellow bullhead, brown trout (stocked), eastern chain pickerel, fallfish, yellow perch.

Both zones #2 and #4 are downstream of their respective dams, and therefore the zones do not present a barrier to downstream fish passage.

Using designs approved by FERC letters dated January 8, 1999 (Lower Robertson Project) and July 20, 2001 (Ashuelot Project), downstream fish passage was installed at the Lower Robertson Project in the summer of 1999 and at Ashuelot in late 2001. The passage facility plans were approved by resource agencies and FERC and have been operating ever since. As mandated by NHFG and FWS, downstream fish passages are opened at both sites from April – June 15, and August 15 – October 15, and use a flow of 40 cfs (the application stated 25 cfs but the Applicant later confirmed 40 cfs as the correct value). In addition, fish bars which reduce the openings between trash rack bars to $\frac{3}{4}$ " are installed from April – October 15.

CRC commented that in order to be a true Low-Impact facility and meet the goal for this criterion, it is incumbent on the Applicant to make sure that the downstream passage for shad is safe and effective. Additionally, if a LIHI certificate is issued, it should contain a condition to provide monitoring of fish (potentially via a pit-tag study) using the downstream fish passage to ensure that shad and other species are successfully and safely passing the dam on their out migration.

NMFS commented that American shad are annually stocked upstream of the Lower Robertson Dam and must pass downstream to reach estuarine and marine habitats as part of their life cycle. NMFS considers high downstream survival standards an important component of shad restoration and notes that the Application and the July 20, 2001 FERC Order Approving Downstream Fish Passage Plan both lack details on dimensions of the receiving water body, namely depth, or any other information that highlighted standards used to ensure safe downstream passage. NMFS noted that downstream passage measures should incorporate the 2017 U.S. Fish and Wildlife fish passage criteria to ensure safe and timely passage.

Based on my review of the application, supporting documentation, input from agencies and stakeholders, and publicly available information, both Projects satisfy the Downstream Fish Passage and Protection criterion. Regarding the NMFS comment, the Applicant consulted with NHFG and FWS during the design of the downstream passage facilities and FWS concluded that the proposed design plans generally conformed with FWS standards at the time.

In response to LIHI inquiry, NHFG commented that the agency would like to see the downstream passage season extended and provided an informal FWS request to extend the season from October 15 to November 15 or when river water temperatures are less than 10°C for

3 consecutive days, whichever comes first, which would be beneficial and account for annual variability in temperature. As such, while the Projects currently meet the selected standard and satisfy Criterion D, the Applicant should consult with the resource agencies regarding their new request to extend the downstream passage season. If the Applicant agrees to extend the season beyond what is currently required, there could be economic impacts from loss of some generation by flows diverted to the downstream fishways. Therefore, if the Applicant formally commits to an extension, the Projects could be awarded a PLUS standard.

The Projects Pass Criterion D – Downstream Fish Passage and Protection

E. SHORELINE AND WATERSHED PROTECTION

Goal: The Facility has demonstrated that sufficient action has been taken to protect, mitigate and enhance the condition of soils, vegetation and ecosystem functions on shoreline and watershed lands associated with the facility.

Assessment of Criterion Passage: The Applicant appropriately selected Standard E-1, Not Applicable/De Minimis Effect in all ZOE's.

The impoundments mostly abut private property and therefore are beyond the control of the Applicant. There have been no requests for Shoreline Management Plans nor do the Projects have such plans. Automatic level control is used in both sites and maintains pond levels within a few inches during normal flows, and discharges at true run-of-river amounts which minimizes potential erosion in the impoundments. Impoundment drawdowns only occur every few years, for maintenance purposes.

Lower Robertson is abutted by Route 119 on the north side of the impoundment and abandoned mill developments on the south. The Ashuelot impoundment is forested on both sides of the river. Both sites are located close to the remains of the old mills which originally built them. The downstream reaches for both sites are very similar: fast moving current in a relatively steep and rocky riverbed, bordered by mixed hard and softwood forest returning from cleared land. There are no critical habitats and the Project footprint is quite small with less than one acre of land above water at Lower Robertson and less than two acres at Ashuelot.

The Applicant has also selected **Standard E-Plus** for all ZOE's.

The Applicant and its principals voluntarily donated to the Society for the Protection of New Hampshire Forests for the preservation of 1,800 acres of forest land in the Ashuelot headwaters. The donations were: \$15,000 in 2008, \$5,000 in 2010, and \$5,000 in 2014. The 1,800 acres were successfully preserved and are now named the Ashuelot River Headwaters Forest. The Applicant intends to continue to support preservation of the Ashuelot River basin with annual donations to selected environmental organizations and causes that the principals identify as most urgently in need of funding.

ARLAC commented that the last donation by the Applicant towards preservation of the Ashuelot watershed was in 2014, as noted in the application. In response, the Applicant commented that

its principals have donated to land conservation organizations in the Ashuelot basin in most years since 2014. Recently, the principals have made leadership gifts or pledges to projects in the California Brook focus area in Chesterfield (Monadnock Conservancy) and now the Surry Mountain Project in Surry (The Nature Conservancy).

Based on my review of the application, supporting documentation, input from agencies and stakeholders, and publicly available information, both Projects satisfy the Shoreline and Watershed Protection criterion and meet the PLUS standard because the Applicant has supported and continues to support land protection efforts that provide watershed enhancements at a level that provides more than the equivalent of 50% land protection value of Project lands.

The Projects Pass Criterion E – Shoreline and Watershed Protection

F. THREATENED AND ENDANGERED SPECIES PROTECTION

Goal: The Facility does not negatively impact federal or state listed species.

Assessment of Criterion Passage: The Applicant appropriately selected Standard F-1, Not Applicable/De Minimis Effect for all ZOE's.

The federally endangered Dwarf wedgemussel (*Alasmidonta heterodon*) is present in the upper reaches of the Ashuelot River, but not in the vicinity of the Projects according to recent information from FWS provided as part of the application. Additionally, the home range of Northern long eared bats includes the Project areas; however, no hibernacula, or roosting sites are known to exist in the Project areas. Should any be found, the Applicant is committed to following the FWS rule 4(d) that prohibits tree cutting within ¼ mile of hibernacula and prohibits cutting of known roost trees during summer months. Since the Projects have such small land footprints, tree cutting is unlikely to occur.

The Applicant provided a supplement to the application which included a NH Natural Heritage Bureau report indicating historical, but not current records within 1.5 miles downstream of the Project of the state-endangered long-spined sandbur (*Cenchrus longispinus*) a plant that occurs in sandplains and disturbed openings. The species was last observed in 1952.

The Applicant also notes that in general, the land around the Projects continues to successfully recover from industrialization, and they see an occasional bald eagle flying over, great blue herons more commonly, river otters and mink are resident, and beaver sign is very common.

Based on my review of the application, supporting documentation, input from agencies and stakeholders, and publicly available information, both Projects satisfy the Threatened and Endangered Species criterion.

The Projects Pass Criterion F – Threatened and Endangered Species Protection

G. CULTURAL AND HISTORIC RESOURCE PROTECTION

Goal: The facility does not unnecessarily impact cultural or historic resources that are associated with the Facility's lands and waters, including resources important to local indigenous populations, such as Native Americans.

Assessment of Criterion Passage: The Applicant appropriately selected Standard G-2, Agency Recommendation for ZOE #1 and #2 (Lower Robertson Project impoundment and downstream reach), and Standard G-1, Not Applicable/De Minimis Effect for ZOE #3 and #4 (Ashuelot Project impoundment and downstream reach).

Article 10 of the FERC exemption order for the Lower Robertson Project requires the Applicant to consult with the New Hampshire SHPO during the course of construction or development of any Project works or associated facilities for the protection of significant or historic resources. No significant new construction has occurred since 1986, and none is currently needed or planned, other than potentially fish passage. Should fish passage be required in the near future, the NH Division of Historical Resources indicated in 2005 that it would have no effect on local historical resources.

ARLAC commented that most up-to-date documentation regarding cultural and historical resources in the project area is from 2005 and an updated inquiry with the NH State Historic Preservation Office would be helpful. This recertification review considered Project operations since the last recertification in 2014. The Applicant states that there have been no material changes, therefore, there has been no need to consult with the SHPO. However, given the potential for upstream fish passage facilities the Applicant must consult with the SHPO prior to commencing construction of those facilities.

The Ashuelot Project exemption and the 2003 FERC Environmental Inspection Report do not list cultural or historic management as a resource issue of any concern. The 2011 Environmental Inspection Report for the Lower Robertson Project indicates that the dam and facilities are of "local historical interest". The Applicant was required to consult with the SHPO prior to installation of the Obermeyer crest gates at that Project. The Applicant reported a telephone consultation with the SHPO that confirmed the action would not have an impact on historic resources. The only structure nearby is an old mill, not currently listed as an official historic resource. Searches by the New Hampshire Department of Natural and Cultural Resources during previous LIHI certifications have shown no cultural or historic resources in the Project areas.

Based on my review of the application, supporting documentation, input from agencies and stakeholders, and publicly available information, both Projects satisfy the Cultural and Historic Resource Protection criterion.

The Projects Pass Criterion G - Cultural and Historic Resource Protection

H. RECREATIONAL RESOURCES

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.

Assessment of Criterion Passage: The Applicant appropriately selected Standard H-2, Agency Recommendation for all ZOE. However, this review finds that Standard H-3, Assured Accessibility is the more appropriate standard.

Article 2 of the Projects' FERC Exemptions require adherence to conditions issued by resource agencies including the requirement to allow basic riverine access.

There is no formal recreation plan. The Project lands around both impoundments and downstream reaches are not fenced nor posted, and no fees or charges are applied to visitors.

The Lower Robertson Project allows recreational access. The defunct mill across the river from the Project offers a parking area where fishers and boaters sometimes park. The river bank by the mill also allows an easy portage or launch site for boaters. The powerhouse/intake area is fenced for security, but it is located on the other side of the river in a thin strip of land between Route 119 and the water. People rarely access the river from that side because the banks are either steep, or covered in poison ivy, or both.

River access is also provided at the Ashuelot Project. During LIHI certification in 2009, at the request of a local paddlers' association, the Applicant completed construction of a portage trail in 2010. The portage trail has been maintained since then and is occasionally used. Shoreline fishing access at Ashuelot is also available by Lost Road.

CRC commented that recent documentation by local residents suggests that the portage trail is not well maintained. However, email correspondence between LIHI staff and CRC clarified that CRC had been mistaken and the portage trail is well maintained.

Based on my review of the application, supporting documentation, input from agencies and stakeholders, and publicly available information, both Projects satisfy the Recreational Resources criterion.

The Projects Pass Criterion H – Recreational Resources

VIII. GENERAL CONCLUSIONS AND REVIEWER RECOMMENDATION

Based on my review, I believe that the Projects conditionally meet the requirements of Low Impact Certification and recommend they be re-certified for an eight-year period including the PLUS for shoreline and watershed protection with the condition noted below. In addition, an optional PLUS is recommended for voluntary actions related to fish passage.

- **Condition 1:** The Facility Owner shall submit copies of the 2019 water quality monitoring report required by NHDES and all correspondence with the agency to LIHI upon completion of the 2019 monitoring period. LIHI reserves the right to additionally condition the Project's LIHI Certificate or reconsider the certification decision based on the information provided.
- **Condition 2 (optional):** If at any time prior to six months before the expiration of the Certification term the Facility Owner implements: a) upstream eel passage at both Projects; and/or extends the current downstream fish passage season at both Projects to November 15, LIHI will review that information and determine whether or not to award a second PLUS standard and extend the Certificate term for two additional years.

APPENDIX A
Stakeholder Letters and Other Key Correspondence

Ashuelot River Local Advisory Committee

Washington Lempster Marlow Gilsum Sullivan Surry Keene Swanzey Winchester Hinsdale
August 9, 2019

Low Impact Hydropower Institute
329 Massachusetts Avenue, Suite 6
Lexington, MA 02420

RE: Ashuelot River/Lower Robertson Hydroelectric Projects (LIHI #46)
Low Impact Recertification

Reviewing the criteria for low impact hydroelectric project certification, the Ashuelot River LAC believes the principals of Ashuelot River Hydro Inc. (ARH) generally continue to operate within the criteria stipulated by LIHI for certification. However, inherent in the presence of dams is the obstruction created for fish passage.

While ARH is committed to installing upstream fish passage in response to trigger numbers of American Shad found at Fiske Hydro, fish passage in this river segment remains our greatest concern. The fish ladder at Fiske Hydro has not been operational and efforts are being made to encourage functional operation and accountability at this site.

In the meantime, migratory species are present in this stretch of river with adult American Shad trapped yearly at the Holyoke Massachusetts project and stocked upstream of the Lower Robertson Dam. This year a survey conducted by US Fish and Wildlife found 135 Sea Lamprey nests from the Rte 63 bridge in Hinsdale and downstream. The sea lamprey is a Species of Concern in New Hampshire due to significant declines in its historic spawning range following the construction of large mainstem dams.

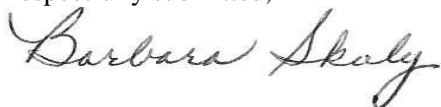
NH Fish and Game reports in their online NH Fish Survey Map the presence of American Eels both upstream and downstream of the two ARH projects and states that "eel numbers have been greatly reduced upstream of dams constructed on North American rivers and streams over the past 300 years."

It can be conjectured that the presence of the dams on the Ashuelot greatly influences the low eel numbers and ARLAC would like to see the construction by ARH of ramps with wetted surfaces to enable eels to climb over the dams. It is noted that the last donation by ARH towards preservation of the Ashuelot watershed was in 2014. We would see this effort to promote the continuity of fish passage at the dam sites as showing a commitment to preservation of the integrity of the river system.

We see no impacts to water quality resulting from the operation of the dams at this time. However, we understand that data to support water quality standards are being collected this summer and we reserve the right to comment if an impact is determined.

The last documentation noted regarding cultural and historical resources in the project area is from 2005. We would like to see an updated inquiry with the NH State Historic Preservation Office for this recertification.

Respectfully submitted,



Barbara Skuly, Chairman

Ec: T. Sales, NHRMPP; T. Walsh, NHDES
B. King, ARH



Connecticut River Conservancy

Clean water. Healthy habitat. Thriving communities.

15 Bank Row, Greenfield, MA 01301
413.772.2020 · www.criver.org

August 10, 2019

Low Impact Hydro Institute
329 Massachusetts Ave
Suite 6
Lexington, MA 02420

Re: Comments on the Lower Robertson and Ashuelot Hydroelectric Projects LIHI Certification Application

To Whom it May Concern:

The Connecticut River Watershed Council, Inc., doing business as the Connecticut River Conservancy (CRC), is a nonprofit watershed organization that was established in 1952 as a citizen group to advocate for the protection, restoration, and sustainable use of the Connecticut River and its four-state watershed. CRC has an interest in protecting environmental values that directly and indirectly support the state, regional, and local economies and quality of life of the Connecticut River. In that capacity, we routinely participate in the relicensing of the multiple hydro-electric facilities that exist in the Connecticut River watershed.

CRC assumes that this recertification is being examined under a Stage II process since there has been a material change in the certification process with the implementation of the 2nd Edition Handbook.

3.2.2 Criterion B - Water Quality

The stated goal for water quality is that, "Water quality is protected in waterbodies directly affected by the facility, including downstream reaches, bypassed reaches, and impoundments above dams and diversions."¹

The applicant claims that they satisfy this criterion under Standard B-3. In order to satisfy this standard they must demonstrate that the facility is "in compliance with the quantitative water quality standards established by the state or other regulatory authority to support designated uses pursuant to the federal Clean Water Act or other applicable statute in the facility area and in the downstream reach."²

The applicant states that New Hampshire Department of Environmental Services (NH DES) is requiring updated water quality testing to certify if the facility is in compliance with this criterion and they request recertification pending water quality test results. Assuming that LIHI complies with this request, CRC expects that the applicant will be proactive before the next re-certification process in 2025

¹ Low Impact Hydropower Certification Handbook. 2nd Edition. Revision 2.03: December 20, 2018. Low Impact Hydropower Institute. Page 7.

² Ibid. Page 8.

to make sure that this water quality data collection is done before they submit their application. Given the timing of the current application, CRC will defer to the NH DES on comments related to this criterion.

3.2.2 Criterion C - Upstream Fish Passage

The stated goal for upstream fish passage is that, "The facility allows for the safe, timely, and effective upstream passage of migratory fish. This criterion is intended to ensure that migratory species can successfully complete their life cycles and maintain healthy, sustainable fish and wildlife resources in areas affected by the facility."³

The applicant claims that they satisfy this criterion under Standard C-2. In order "to pass the upstream fish passage criterion the applicant must demonstrate that ... the facility is in compliance with science-based fish passage recommendations issued by appropriate resource agency(ies) for the facility and which may include provisions for appropriate monitoring and effectiveness determinations."⁴ Since successful migratory fish passage has not been accomplished at Fiske Mill Dam, the downstream obstacle, the trigger has not yet been met to require upstream passage for shad. It is our understanding that the applicant is anticipating provided upstream passage and is currently researching different alternatives and preparing for this capital expense. CRC encourages this continued effort and points out that riverine fish would also benefit from this ability to move between habitat areas. While the trigger has not been met, nothing precludes Ashuelot River Hydro from providing upstream passage now.

Additionally, American eel have been documented in the Ashuelot River above and below these projects⁵. There is no indication in the documentation provided that the applicant has considered upstream passage for juvenile American eel which may require a different physical structure to maximize population regeneration. It is our understanding that traditional fish passage ladders may be ineffective at passing juvenile American eel. Given the obstacle at Fiske Mill dam it is not justified to require appropriately designed upstream passage for America eel at this time, but the applicant should anticipate this need and begin research efforts in advance of this requirement.

3.2.3 Criterion D - Downstream Fish Passage and Protection

The stated goal for downstream fish passage and protection is that, "The facility allows for the safe, timely, and effective downstream passage of migratory fish. For riverine (resident) fish, 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 to maintain healthy, sustainable fish and wildlife resources in the areas affected by the facility."⁶

The applicant claims that they satisfy this criterion under Standard D-2. In order to satisfy this standard they must show that, "the facility is in compliance with a science-based resource agency recommendation for downstream fish passage or fish protection, which may include provisions for

³ Low Impact Hydropower Certification Handbook. 2nd Edition. Revision 2.03: December 20, 2018. Low Impact Hydropower Institute. Page 8.

⁴ Ibid.

⁵ New Hampshire Fish Survey Map. Accessed on August 8, 2019 at: <https://nhfg.maps.arcgis.com/apps/MapJournal/index.html?appid=d6549e90155b441fa0e29bdc44eebc2b>

⁶ Low Impact Hydropower Certification Handbook. 2nd Edition. Revision 2.03: December 20, 2018. Low Impact Hydropower Institute. Page 9.

appropriate monitoring and effectiveness determinations.”⁷

The applicant included documentation that indicates that downstream fish passage was required for salmon smolts in 2001. It is our understanding that American shad have been stocked upstream of the Lower Robertson Project since 2005. In order to be a true Low-Impact facility and meet the goal for this criterion, it is incumbent on the applicant to make sure that the downstream passage for shad is safe and effective. If a certificate is issued, it should contain a condition to provide monitoring of fish using the downstream fish passage to ensure that shad and other species are successfully and safely passing the dam on their out migration. This could be done with a pit tag study.

3.2.6 Criterion F - Threatened and Endangered Species Protection

The stated goal for this criterion is that, “The facility does not negatively impact federal or state listed species.”⁸ The applicant seeks to satisfy this criterion under Standard F-2 Finding of No Negative Effects for both the tailrace and impoundment. In order to satisfy this criterion the applicant needs to show that, “the facility has been found by an appropriate resource management agency to have no negative effect on them, or habitat for the species does not exist within the project’s affected area or is not impacted by facility operations.”⁹

The only documentation in the application is from 2009. The applicant refers to an email with Melissa Grader from the USFWS on Feb. 16, 2019, but that email exchange is not included in the application. CRC assumes there was a mistake in compiling the application and will defer to USFWS for comments on this criterion. The applicant should submit a corrected application to be included for the public record.

3.2.8 Criterion H - Recreational Resources

The goal of this criterion is that, “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.”¹⁰ The applicant claims to satisfy this criterion under Standard H-2 which requires that the, “facility demonstrates compliance with resource agency recommendations for recreational access or accommodation (including recreational flow releases), or any enforceable recreation plan in place for the facility.”¹¹ The applicant has provided a portage trail for the Ashuelot River Project. Recent documentation by local people would seem to indicate that it may not currently be well maintained.

In general the applicant, as many other LIHI applicants, relies on the basic requirements in place for FERC relicensing, or in this case FERC exemption. It is CRC’s contention that since the granting of a Low Impact Hydro Certificate often provides for direct compensation through access to renewable energy credits to the hydro owner, that in all cases, the facilities do more than what is simply required of them by regulation in order to earn the Low Impact Certificate. Additionally, as the certificate needs to be renewed every five years, all facilities should provide documentation from *the previous five years to prove* that, water quality is good, fish passage is safe and effective, recreational amenities are being used effectively, the shoreline is continuing to be protected, and that there is no new information about endangered species that needs to be considered.

⁷ Ibid.

⁸ Ibid. Page 11.

⁹ Ibid.

¹⁰ Ibid. Page 12.

¹¹ Ibid. Page 13.

CRC is very grateful for the opportunity to comment. CRC is supportive of the Low Impact Hydro designation and feels strongly that certified facilities should go above and beyond what is required by regulation in order to earn this certification. Those efforts will inspire continued innovation in the hydro-electric sector.

Sincerely,

A handwritten signature in black ink that reads "Kathy Urffer". The signature is written in a cursive style with a large initial 'K' and 'U'.

Kathy Urffer
River Steward

Cc: Bob King, Ashuelot River Hydro
Sam Payne, Ashuelot River Hydro
Gregg Comstock, NH DES
Barbara Skuly, Ashuelot River Local Advisory Committee
Bill McDavitt, NMFS
Melissa Grader, USFWS
Katie Kennedy, TNC



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930-2276

August 14, 2019

Shannon Ames
Executive Director
Low Impact Hydropower Institute
329 Massachusetts Avenue
Lexington, MA 02420

RE: Comments on Application for Low Impact Hydro Recertification of the Lower Robertson and Ashuelot Hydroelectric Projects.

Dear Ms. Ames,

On June 11, we received notice that Ashuelot River Hydro, Inc. filed a Low Impact Certification application (application) for the Ashuelot Paper (FERC No. 7791) and Lower Robertson (FERC No. 8235) Hydroelectric Projects on the Ashuelot River in Winchester, NH. We have reviewed the application and the history of certification and recertification documents and we conclude that that Ashuelot River Hydro, Inc. will continue to operate within LIHI's criteria for certification. The application provides important information about fish passage at both projects. We offer the following comments for your consideration.

Section titled "Information Required to Support Ecological Flow Standards"

We support each of the projects operating in run-of-river mode and conforming to the stream flow gauging plan. We do not have site specific information to make a minimum flow recommendation.

Section titled "Information Required to Support Upstream Fish Passage Standards."

This section provides valuable information on the two projects, specifically the explanation of the trigger number of 150 shad spawning in the reach between Fiske Mill and Lower Robertson. The decision for that trigger number was made in a previous licensing and given the history at this site, we do not object to maintaining the trigger number. This trigger number may need reconsideration if passage at Fiske Mill Hydro is provided by means other than the current fish lift. We anticipate that Fiske Mill Hydro will initiate formal monitoring in 2020 at the Fiske Mill Project (FERC P-8615), which will inform our decision to initiate passage at the Ashuelot Paper and Lower Robertson projects, as appropriate.

Section titled "Information Required to Support Downstream Fish Passage Standards"

Based on American shad stocking numbers from the New Hampshire Fish & Game Department, Adult American shad have been trapped at the Holyoke Project in Massachusetts and stocked upstream of the Lower Robertson project since 2005 (Table 1). The post-spawn adults and juveniles must pass downstream to reach estuarine and marine habitats as part of their life cycle. Stich et al. (2018) found that high downstream survival standards juveniles and post-spawn adults provides the highest likelihood for recovering the shad population in the river, and we view this as an important component of shad restoration.



Table 1. Summary of annual totals of American shad stocked above the Lower Robertson project.

Year	Total Released
2005	721
2006	267
2007	793
2008	393
2009	252
2010	141
2011	180
2012	421
2013	672
2014	142
2015	498
2016	351
2017	403
2018	318

We support the use of trash rack bars with 3/4" spacing to prevent entrainment into the turbines at both project sites. The application however, does not provide any dimensions on receiving water body, namely depth, or any other information that highlighted any standards that were used to ensure that fish the pass via the downstream migrant pipe were not harmed. The July 20, 2001 FERC Order Approving Downstream Fish Passage Facility Plan does not provide any additional detail on the receiving water body for fish that pass via the downstream pipe. The final design of the downstream passage measures should incorporate the U.S. Fish and Wildlife criteria to ensure safe and timely passage (USFWS 2017).

Thank you for the opportunity to comment on this recertification application. If you have any questions please contact Sean McDermott (sean.mcdermott@noaa.gov / 978-281-9113)

Sincerely,



Christopher Boelke
New England Field Office Supervisor
for Habitat Conservation

Reference

Stich, D.S., Sheehan, T.F., and Zydlewski, J.D. 2018. A Dam Passage Performance Standard Model for American Shad. Canadian Journal of Fisheries and Aquatic Sciences(ja).
USFWS. 2017. Fish passage Engineering Design Criteria. US Fish and Wildlife Service, Northeast Region R5, Hadley, MA.

Ashuelot River Hydro, Inc.

42 Hurricane Rd.
Keene, NH 03431
(603) 352-3444

August 22, 2019

Ms. Maryalice Fischer
Low Impact Hydropower Institute
329 Massachusetts Ave., Suite 6
Lexington, MA 02420

RE: Re-certification of Ashuelot and Lower Robertson Hydro Projects
Response to letter from ARLAC

Dear Ms. Fischer:

We are in receipt of the August 9 letter from the Ashuelot River Local Advisory Committee (ARLAC) regarding re-certification of our hydro projects on the lower Ashuelot River. We appreciate the efforts of ARLAC in caring for the health of the Ashuelot River ecosystem and in taking the time to comment on our re-certification.

Regarding eel passage, which is also mentioned in the comment letter from the Connecticut River Conservancy (CRC), we understand this is not currently a requirement of the resource agencies but that ARLAC and CRC would like us to plan ahead. We continue to educate ourselves on fish passage, including eel passage, so that we will be well prepared when the time comes. We recently toured the Silvio Conte Anadromous Fish Lab (thanks to the CRC) and discussed the latest designs for fish passage as well as who the experts are with whom we should consult. We have experience running upstream eel passage at our hydro plant in West Springfield, MA. Eel passage has been a challenge at this site for numerous reasons. We are now in search of consultants who can help us improve our eel passage. We are doing this in coordination with the Massachusetts Dept. of Fish & Game. Lessons learned in West Springfield will be helpful at these and other projects.

The ARLAC letter mentions that our company last donated to land conservation in the Ashuelot basin in 2014. To be clear, we are not aware that ongoing participation in local environmental conservation efforts is a requirement for re-certification. That said, Ashuelot River Hydro has made significant charitable donations every year since that time. These donations have all been in support of increased energy efficiency at various public and non-profit buildings in the Ashuelot basin. Our belief is that climate change is the greatest threat to the planet and that reduced use of energy is part of the solution. With a spate of public building projects in recent years we felt compelled to apply whatever leverage we could to move those buildings in a green direction.

Another part of the solution to climate change remains land conservation, particularly conservation of wild lands, which are shown to be the most effective carbon sinks. That is one reason why the principals of our company have donated to land conservation organizations in the Ashuelot basin in most years since 2014. Recently, we have made leadership gifts or pledges to projects in the California Brook focus area (Monadnock Conservancy) and now the Surry Mountain Project (The Nature Conservancy). Please rest

assured, our company and its principals are not asleep at the wheel, though we do adjust the sources for and recipients of charitable donations based on personal tax and income situations as well as the conservation opportunities that present themselves.

Again, thank you for the opportunity to respond to comments. We are happy to answer any follow up questions. Please contact Sam Payne at (603) 903 7693.

Sincerely,

A handwritten signature in black ink, appearing to read 'R. King', is centered on a light-colored rectangular background.

Robert E. King, President

cc: Barbara Skuly, ARLAC
Kathy Urffer, CRC

Email correspondence between LIHI and New Hampshire Fish and Game

From: Carpenter, Matthew <Matthew.Carpenter@wildlife.nh.gov>
Sent: Tuesday, August 13, 2019 2:20 PM
To: mfischer@lowimpacthydro.org
Cc: Henderson, Carol <Carol.Henderson@wildlife.nh.gov>
Subject: RE: LIHI recertification questions for Ashuelot River Hydro

Melissa Grader, of USFWS, suggested, “Nov. 15 or when river temps are below 10 degrees C for 3 consecutive days (whichever comes first)”. That seems reasonable to me. I like the temperature component because it captures year to year variability. Last year was a cold end to the fall and eels likely moved out by late October. Some years it stays warm all the way into early November.

From: Carpenter, Matthew <Matthew.Carpenter@wildlife.nh.gov>
Sent: Tuesday, August 13, 2019 1:52 PM
To: mfischer@lowimpacthydro.org
Cc: Henderson, Carol <Carol.Henderson@wildlife.nh.gov>
Subject: RE: LIHI recertification questions for Ashuelot River Hydro

Hi Maryalice,

I think the downstream passage provisions seem reasonable. I would like to see the time window extended into the first week of November to capture the full downstream passage season for silver eels. I do think that the projects are good candidates for upstream eel passage as improvements will be made in eel passage at Fiske Mill following relicensing. One of the USFWS biologists in Nashua is an expert at siting and installing upstream eel passage and he may be available to work with them on implementing upstream eel passage at these projects.

Matt

From: mfischer@lowimpacthydro.org <mfischer@lowimpacthydro.org>
Sent: Tuesday, August 13, 2019 1:08 PM
To: Carpenter, Matthew <Matthew.Carpenter@wildlife.nh.gov>
Subject: RE: LIHI recertification questions for Ashuelot River Hydro

Hi Matt,

I'm following up on the LIHI recertification application for Ashuelot River Hydro and the email trail below. Does NHFG have any current concerns about a need to provide upstream passage for American eel at this project? What about any NHFG concerns for the effectiveness/protection of downstream passage for any species – it would seem to me that the current downstream passage provisions would be sufficient for the species of interest. Do you agree?

Thank you,
Maryalice

Maryalice Fischer
Certification Program Director
Low Impact Hydropower Institute
mfischer@lowimpacthydro.org
603-664-5097 office (best option)
603-931-9119 cell