FEDERAL ENERGY REGULATORY COMMISSION
Washington, DC 20426
March 1, 2013

OFFICE OF ENERGY PROJECTS

Project No. 1889-081 – Massachusetts
Project No. 2485-063 – Massachusetts
FirstLight Hydro Generating Company

Mr. John S. Howard
Director - FERC Hydro Compliance
FirstLight Hydro Generating Company
Northfield Mountain Station
99 Millers Falls Road
Northfield, MA 01360

Subject: Identification of PAD Deficiencies, Additional Information Requests, and Study Requests

Dear Mr. Howard:

After reviewing the Turners Falls Project and Northfield Mountain Pumped Storage Project Pre-Application Document (PAD) and the transcripts of our January 30 and 31, 2013 scoping meetings, we determined that there are some deficiencies in the PAD. We also have determined that there is a need for additional information and study requests in order to gain information necessary for our preparation of environmental documents.

We identify the PAD deficiencies and existing additional information needs in the attached Schedule A, and we provide our study requests in the attached Schedule B. Please provide the deficiencies and additional information requested in Schedule A when you file your proposed study plans, on or before April 15, 2013. The last part of Schedule A includes comments on the PAD which should be used during the preparation of the Preliminary License Proposal and the License Application. Please note that if you propose any plans for measures to mitigate project impacts, drafts of those plans should be filed with the PLP and finalized and filed with the license application.

Finally, please note that we may determine a need for additional studies or information upon receipt and review of scoping comments/study requests and FirstLight Hydro Generating Company's proposed study plans.

The Commission strongly encourages electronic filings via the Internet in lieu of paper. See 18 CFR § 385.2001(a)(1)(iii) and the instructions on the Commission's website (http://www.ferc.gov) under the "e-Filing" link.

Commission staff will participate in your study plan meeting on Tuesday, May 14 and Wednesday, May 15, 2013, from 10 a.m. to 4 p.m. at the Northfield Mountain Visitor's Center, 99 Millers Falls Road, Northfield, MA, 01360. This meeting will be held to discuss your proposed study plans and study requests filed by the Commission, agencies, and other parties. Interested individuals are invited to attend and should contact John Howard at (413) 659-4489, or via email at John.Howard@gdfsuezna.com if they plan to attend.

If you have any questions, please contact Kenneth Hogan at (202) 502-8434 or via email at: kenneth.hogan@ferc.gov.

Sincerely,

Timothy J. Welch, Chief
West Branch
Division of Hydropower Licensing

Enclosures: Schedule A
Schedule B

cc: Mailing List
Public Files

PRE-APPLICATION DOCUMENT DEFICIENCIES, ADDITIONAL INFORMATION REQUESTS, AND COMMENTS

Based on our review of the Turners Falls Project and the Northfield Mountain Pumped Storage Project Pre-Application Document (PAD), we identified (a) some deficiencies in the PAD and (b) additional information that we require for continuing to process the relicensing of the project. Please file the requested supplemental information to resolve the deficiencies and responses to the additional information requests (AIRs) by April 15, 2013.

A. Deficiencies

Turners Falls and Northfield Mountain Pumped Storage Projects

1) Project Facilities and Operations

Please provide the dependable capacity of the Turners Falls Project and the Northfield Mountain Pumped Storage Project and the basis for the determination of the dependable capacity as required per § 5.6(d)(2)(iii)(E) of the regulations.

Please provide land use maps which include key features as required per § 5.6(d)(2)(ii) of the regulations.

2) Geology & Soils

The PAD describes the soils and occurrences; however, it does not provide descriptions of chemical characteristics, erodability and potential mass movement as required by section 5.6(d)(3)(ii)(B) of the Commission's regulations. Therefore, to the extent known, please provide a description of chemical characteristics, erodability and potential mass movement of soils in each project's area.

Additionally, section 5.6(d)(3)(ii)(C) specifies that the PAD provide information on the erosion within the project area. However, while the PAD provides information on erosion around the Turners Falls reservoir, it did not provide any information on the presence of erosion, mass soil movement, slumping or other forms of instability along the bypass reach or the project's power canal. Therefore, pursuant to section 5.6(d)(3)(ii)(C)(2) of the Commission's regulations please provide a description of all known erosion sites within the Turners Falls project's bypass reach and/or along its power canal, and to the extent known, a determination as to the cause of the erosion. The

description of each site should include the length of shoreline affected by erosion, the height of the eroded area, and the soil type.

As specified in § 5.6(d)(3)(ii)(C), please provide a description of reservoir shorelines within the Northfield Mountain upper reservoir. The description should include a description of soils, geometry, and existing armoring and stabilization measures.

As specified in § 5.6(d)(3)(ii)(B), please provide a description of the sediment management in the Northfield Mountain upper reservoir, including monitoring, removal and disposal.

3) Water Resources

Please provide the Northfield Mountain upper reservoir maximum, minimum and mean depth as well as the shoreline length as required per § 5.6(d)(3)(iii)(H) of the regulations.

4) Recreation and Land Use

For Turners Falls Fishway Viewing Area and Bennett Meadow Wildlife Management Area (WMA) please address the ownership information as specified in § 5.6 (d)(3)(viii)(A).

5) Aesthetic Resources

The PAD did not provide information on the description of aesthetic and visual characteristics of the Turners Falls Project dam and adjacent facilities as required by § 5.6(d)(3)(ix). Please provide this information with accompanying photos (if available).

6) Cultural

Please provide a description of existing discovery measures for locating, identifying, and assessing the significance of resources as specified in § 5.6(d)(3)(x)(B).

Please provide available information on Indian traditional cultural and religious properties as specified in § 5.6(d)(3)(x)(C).

B. Additional Information Requests

Turners Falls Project

1) Proposed Changes to Project

In the PAD you identify alternatives you will consider through the licensing process for potential changes to facilities and operation of the Turners Falls Project including the following: (1) upgrade Station No. 1 with new or rehabilitated turbines, (2) close Station No. 1 and add a turbine generator at Cabot of similar hydraulic capacity to Station No. 1's, and (3) use the full hydraulic capacity of Cabot Station turbines. However, you do not describe the extent or range of the possible modifications to the hydraulic capacity of Cabot Station and Station No. 1. Therefore, so that we may fully understand and evaluate your proposal and determine the appropriate studies needed, please provide detail on the physical and operational changes contemplated at the Turners Falls Project.

2) Cultural Resources

In section 5.2.10 of the PAD you propose to conduct a Phase IA Archaeological Survey and Historic Structures Survey of the APE. You also indicate that FirstLight may propose to conduct a Phase IB archaeological and an intensive-level architectural level survey, depending on the results of the Phase IA investigation and after consultation with the Massachusetts, New Hampshire, and Vermont SHPOs. However, you have not provided a map specifically defining the APE, and we are unclear on how you would specifically carry out the various tasks involving your proposed study.

As a result, we ask you to include the following in your study proposal for cultural resources:[1]

a) Define an APE for the project that would include all lands enclosed by the project boundary including both in-water and on-shore project lands and facilities, and lands or properties outside the project boundary where project operations or other project-related activities may directly or indirectly cause changes in the character or use of historic properties, if any historic properties exist. Your study proposal should also include a record

[1] Include in your study proposal that you would also consult with the Vermont, Massachusetts, and New Hampshire SHPOs, and any involved Indian tribe or other interested parties in formulating each of the tasks listed below.

of consultation with the Vermont, Massachusetts, and New Hampshire SHPOs, involved Indian tribes, and other interested parties regarding the APE.[2] Include a detailed map showing all aspects of the APE, including designations of land ownership**.**

b) Include the specific techniques on how you would carry out the Phase IA investigation, in addition to any other methods (if needed) by which other cultural resources that may be directly or indirectly affected by the project will be inventoried. Your proposal should include methods for inventorying all archaeological and historic resources that may lie within the APE, including project facilities, non-project architectural resources, and properties of traditional religious or cultural significance.[3]

c) Develop and include in your study proposal a process for evaluating the National Register of Historic Places (National Register) eligibility of all cultural resources during the field inventory stage, and afterwards, through additional second season field investigations (if necessary)[4], including a strategy for examining, testing, or excavating cultural resources. This process should take into account applicable guidelines and standards promulgated by the Vermont, Massachusetts, and New Hampshire SHPOs.

d) Elaborate on what methods you would use to identify any existing project-related effects (both direct and indirect) on historic properties recorded during the field inventory, and determine how project operations may affect or potentially affect them.

e) Include in any study report: (1) a background section on previous work in and around the APE; (2) a culture history of the research area; (3) definition and map of the APE; (4) methods used for the archival research and field pedestrian survey and how the APE was systematically inventoried; (5) the results of the survey and detailed descriptions of the cultural resources

[2] Once you have defined your APE, send your APE definition and APE map to the Vermont, Massachusetts, and New Hampshire SHPOs and seek their concurrence. The APE definition and map should be included in your study proposal, along with a record of consultation.

[3] Attention should be given on the assessment of the Turner Falls Ceremonial Site and proposed Great Falls Native Cultural Park, and potential project-related effects to these places (see Town of Montague filing, dated February 6, 2013 and filed on February 20, 2013).

[4] If all National Register eligibility determinations cannot be done in either the first or second season of field investigations, a program to follow-up on completing all National Register eligibility determinations of properties located within the APE could be developed and included in the Historic Properties Management Plan (HPMP).

found (including a table depicting type of cultural resources, age, property location, and land ownership associated artifacts, existing and potential effects, and National Register eligibility status); (6) results of National Register evaluations for all cultural resources located within the APE;[5] and (7) site or resource specific descriptions of existing and potential project-related effects on cultural resources considered to be eligible for inclusion in the National Register. Put a statement in your study proposal you will also prepare a HPMP in consultation with the involved parties and will file a draft HPMP along with your preliminary licensing proposal, and a final HPMP with your final license application.[6] Among other things, the HPMP should provide site-specific measures to resolve any potential project-related adverse effect to historic properties located within the project's APE.[7]

f) Provide a schedule for carrying out all of the various tasks involving your study, including the filing of draft and final reports and HPMPs.

g) Provide estimated costs associated with the various tasks in your study, along with the costs of report production and crafting the HPMP.

3) Socio-economic

In PAD section 4.11.1., you cite a document referred to as "PVPC". However, you do not provide the complete citation. Therefore, so that we may fully understand the supporting documentation for the PAD, please provide the complete citation for the

[5] In consultation with the involved parties, once you have determined which cultural resources may, or may not be eligible for the National Register, submit your evaluations to the Vermont, Massachusetts, and New Hampshire SHPOs (as applicable) for concurrence.

[6] Note that once the Commission finds the HPMP to be final, we would attach it to a programmatic agreement and after noticing the Advisory Council on Historic Preservation, we would execute the programmatic agreement with the Vermont, Massachusetts, and New Hampshire SHPOs, if the Advisory Council on Historic Preservation declines to participate. Execution of the programmatic agreement would evidence that the Commission has resolved any potential adverse effects to historic properties involved with the proposed project.

[7] You should use the Guidelines for the Development of Historic Properties Management Plans for FERC Hydroelectric Projects, developed by the Advisory Council on Historic Preservation and Commission in May 2002.

PVPC reference in PAD section 4.11.1. If this document is not readily available to the public please provide a copy of the document.

4) Recreation and Land use

In the PAD, the current project boundary maps are presented. However, it is difficult to discern ownership and extent of shoreline buffer from the maps and associated narrative in the PAD. Therefore, so that we may fully understand and evaluate your proposal and determine the appropriate studies needed, please describe the project boundary (i.e., is it a metes and bounds survey, and elevation contour, or some combination), and shoreline buffer (e.g., typical distance from normal reservoir elevation to the project boundary, vegetative cover types).

In the PAD, there is no information on the recreation facilities and public access and use on the unnamed island located to the west of the power canal and east of the bypassed reach of the Connecticut River. The PAD also lacks information regarding how access to the island may be restricted by project uses. During the scoping meetings, we learned that the island is accessible by two walkway bridges which are currently closed. Therefore, please provide information on the ownership and management of the walkway bridges, and an explanation of why the bridges are closed.

Northfield Mountain Pumped Storage Project

1) Proposed Changes to Project

In the PAD you propose potential changes to facilities and operation of the project including the following: (1) utilize more storage in the Northfield Mountain Project's upper reservoir and, (2) increase the unit and station capacity. However, you do not describe the extent of possible modifications to the hydraulic capacity and to the storage operations within the upper reservoir. Therefore, so that we may fully understand and evaluate your proposal and determine the appropriate studies needed, please provide detail on the physical and operational changes contemplated at the Northfield Mountain Pumped Storage Project.

2) Recreation and Land Use

In the PAD, the project boundary maps are presented. However, it is difficult to discern ownership and extent of shoreline buffer from the maps and associated narrative in the PAD. Therefore, so that we may fully understand and evaluate your proposal and determine the appropriate studies needed, please describe the project boundary (i.e., is it a

metes and bounds survey, and elevation contour, or some combination), and shoreline buffer (e.g., typical distance from normal reservoir elevation to the project boundary, vegetative cover types).

3) Cultural Resources

In section 4.10.4 of the PAD, you state that, by letter dated September 30, 2011, the Massachusetts SHPO has recommended that a qualified cultural resources consultant research and compile the information necessary to identify historic and archaeological resources and archaeologically sensitive areas within the project's APE. In section 5.2.10 of the PAD you propose to conduct a Phase IA Archaeological Survey and Historic Structures Survey of the APE. You also indicate that FirstLight may propose to conduct a Phase IB archaeological and an intensive-level architectural level survey, depending on the results of the Phase IA investigation and after consultation with the Massachusetts, New Hampshire, and Vermont SHPOs. However, you have not provided a map specifically defining the APE, and we are unclear on how you would specifically carry out the various tasks involving your proposed study.

As a result, in your study proposal for cultural resources we ask you to include the same information, specific to the Northfield Mountain Project, as outlined above for the Turners Falls Project.[8]

[8] Include in your study proposal that you would also consult with the Vermont, Massachusetts, and New Hampshire SHPOs, and any involved Indian tribe or other interested parties in formulating each of the tasks listed below.

STUDY REQUESTS

After reviewing the information in the Pre-Application Document (PAD), we identified a gap between the information in the PAD and the information needed to assess project effects. The intent of the following studies is to fill the gap between existing and needed information. On February 22, 2013, FirstLight filed a draft study plan for an Instream Flow Habitat Assessment of the Connecticut River from Turners Falls Dam to the Holyoke Impoundment below Sunderland Bridge. We will review this proposed study and reserve the right to request an instream flow study of this reach at such time as our review is complete. In addition, we recognize that there may be additional existing information that currently has not been identified and may be sufficient to address our additional information needs. As such, please note that we can further discuss the extent of the information gap, additional information, and the relative scope of the requested studies at the study plan meeting(s). As required in section 5.9 of the Commission's regulations, we address the seven study request criteria for the following requested studies.

Study Request #1 - Water Level Fluctuation Study

Projects: Turners Falls & Northfield Mountain

Goals and Objectives

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal is to identify hourly reservoir elevations throughout the upstream and downstream reaches affected by the project in order to assess project effects on aquatic and terrestrial resources under current and proposed operation. Specifically the study should identify hourly water levels and flows within the upstream and downstream reaches under project operation conditions for the full range of inflows to provide information and inform FirstLight's proposed Erosion Causation Study, and inform an analysis of project-related effects on aquatic resources and terrestrial resources.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study*.

The Federal Energy Regulatory Commission must decide whether to issue a new license to FirstLight for the Turners Falls and Northfield Mountain projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the project, as well as power and developmental values. Any license issued shall be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

Project operations affect reservoir and tailrace water levels on an hourly basis (or finer increment), which may affect several environmental resources. Understanding the projects' influence on hourly water levels and flows within the Connecticut River is essential to understand the effect of project operations on these environmental resources; and therefore, is relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information*

The PAD provided general information about the magnitude of the licensed limits for water level fluctuation in the Turners Falls reservoir (lower reservoir) and referenced information on the hydrology, hydraulics, and erosion conditions along the river reach below the Vernon Project and above Turners Falls. For instance, FirstLight cited an Army Corps of Engineers (USACE) *Report on Connecticut River Streambank Erosion Study, Massachusetts, New Hampshire and Vermont*.[9] This report looked at erosion along a 141 mile reach of the River from the Turners Falls dam to the headwaters of the Wilder Project.[10] FirstLight also noted its Full River Reconnaissance (FRR) studies to

[9] Simons, D.B., Andrew, J.W., Li, R.M., & Alawady, M.A. (1979). Connecticut River Streambank Erosion Study: Massachusetts, New Hampshire, and Vermont. Waltham, MA: US Army Corps of Engineers (USACE).

[10] We note that the USACE's report quantified multiple contributing factors to bank erosion, and summarized that the erosional forces on river banks due to the project operation fluctuation of water levels was 15 to 18 percent of the shear stress forces

document existing bank conditions within the Turners Falls Impoundment in 1998, 2001, 2004, and 2008. Based on this existing information, FirstLight proposes an Erosion Causation Study.

While this information is available, it is insufficient to fully inform FirstLight's proposed Erosion Causation Study. For example, the USACE's study and corresponding report was completed in 1979 and, while it considered the hydraulics of the Connecticut River at that time, water fluctuations may have changed as a result of alterations to project operations since 1979.[11] Additionally, FirstLight's FRR studies did not take into consideration river hydraulics and only monitored and assessed the conditions of the streambank along the Turners Falls impoundment.

FirstLight noted during the scoping meetings that normal fluctuations are generally lower than the licensed limits. However, the PAD did not provide information on the variability, rate of change or the frequency of fluctuation within the lower reservoir, the Turners Falls bypass reach, and in the Connecticut River downstream of the Turners Falls Project tailraces. The data from this water fluctuation study, coupled with information in the PAD, and the proposed Erosion Causation Study should provide information to fully understand the effect of project operations on multiple environmental resources (e.g. geology and soils, aquatic resources, and terrestrial resources).

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

The applicant notes the project-related effects of water level fluctuations upon soils and geology resources in the PAD, as well the potential impact to terrestrial and aquatic resources. Operation of the Northfield Mountain pumped storage project results in the transfer of water volume between the upper and lower reservoirs, producing water level fluctuations throughout the Turners Falls reservoir. The water levels in this lower reservoir are lower during pump-back operations and higher during generation cycles, potentially occurring several times per day. The fluctuation in water levels effect the

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caused by the flowing water.

[11] See Transcripts of Northfield Mountain Pumped Storage Project and Turners Falls Hydroelectric Project evening Scoping Meeting filed on January 31, 2013.

soils along the reservoir through saturation and dewatering of the embankment materials potentially increasing their susceptibility to erosion.

The information from this requested study should provide the variations in water elevations and fluctuation rates for various project pump/generation cycle operations during a variety of inflow conditions, identifying the ranges of water level fluctuations rates and variability with inflow and location along the reservoir. The results of this study will be used along with soils information within the PAD and the Applicant-proposed Erosion Causation Study to help identify operation related effects. Additionally, this information would help inform an analysis of project-related effects on aquatic resources and terrestrial resources.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

Conduct the water fluctuation study using an unsteady one-dimensional hydraulic model such as HEC-RAS, verified with in-situ measurements using level loggers at multiple sites within Turners Falls reservoir, canal, bypass reach, and in the tailrace downstream to the upper limit of the Holyoke impoundment. FirstLight should modify its proposed HEC-RAS model to include an unsteady model to analyze the combined influences of inflow fluctuations from the Vernon Hydroelectric Project, tributaries, and the operation of the Northfield Mountain Project.

The study should provide quantification of the water level fluctuations at erosion sites along the reservoir under various inflow conditions, including rates of elevation change and changes to mean velocity in the reservoir. FirstLight should use the results of this study to support its proposed Baseline Inventory to gather information necessary to fully understand the potential effects of project-related water level fluctuations on terrestrial resources (e.g., wetlands and waterfowl). Additionally, the results of this study should allow assessment of project operational effects on aquatic habitat as part of our Requested Study - Aquatic Habitat Mapping of the Turners Falls Impoundment.

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated incremental cost of the study is approximately $80,000, which includes an estimate of 22 hours for a project manager and quality assurance, 500 hours for engineering and field staff, and 55 hours for support staff. An alternative study using just the level loggers might capture the water level fluctuation data, but would not identify the dynamic river flows or isolate the effects of upstream discharges to fluctuations at the upper limit of reservoir influences downstream of the Vernon project.

Study Request #2– Aquatic Habitat Mapping of the Turners Falls Impoundment

Project: Turners Falls

Goals and Objectives

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of this study is to map the aquatic habitat within the Turners Falls Project impoundment in the Connecticut River, evaluate the types of aquatic habitats that occur there, and identify any potential effects the Turners Falls and Northfield Mountain project operations may have on this habitat.

Specifically, the objectives of the study are to:

1. Survey and map the aquatic habitat types distributed within the Turners Falls Project impoundment in the Connecticut River from the upper extent of the Turners Falls Project's impoundment to the Turners Falls dam.

2. Describe the potential influences of the Turners Falls and Northfield Mountain projects' operations on aquatic habitats within the Turners Falls impoundment.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study*.

The Federal Energy Regulatory Commission must decide whether to issue a new license to FirstLight for the Turners Falls and Northfield Mountain projects in the Connecticut River. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued shall be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

Aquatic habitats in the Connecticut River support a sustainable riverine ecosystem that provides public opportunities, including a sport fishery. Ensuring that the effect of project operations pertaining to this resource is considered in a reasoned way is relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information*

Review of FirstLight's PADs, as well as a preliminary review of scientific literature, revealed aquatic habitat mapping data available for the riverine reaches from approximately 30 miles downstream of Turners Falls to the Turners Falls Project, including the bypassed reach. However, information on aquatic habitat within the Turners Falls impoundment is not available. As such, additional aquatic habitat information, including the mapped locations of aquatic habitats in the Turners Falls impoundment is needed to evaluate the projects effects on aquatic resources.

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

Currently, water levels in the Turners Falls impoundment fluctuate due to the current peaking operations of the Turners Falls Project and because the impoundment also serves as the lower reservoir, through the pumped storage operations of the Northfield Mountain Project. As a result, any aquatic habitat exposed under low water levels may be adversely effected and/or inhibit the utilization of aquatic habitats by aquatic species during various life stages. These events may also cause fish or other aquatic species (e.g., mussels and macroinvertebrates) stranding and associated mortality.

This requested study would help establish a baseline condition and the health of the aquatic habitat and aquatic species of the Connecticut River in the Turners Falls impoundment under current operations. These data would also assist in forming the basis for inclusion of potential license articles to protect aquatic resources in the Connecticut River.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

Using generally accepted practices in the scientific community:

1. Conduct field surveys of aquatic habitat during the low flow season (i.e. summer months) from the head of the Turners Falls Project impoundment to the Tuners Falls dam.

2. Categorize habitat survey information per accepted practices in the scientific community (e.g., riverine habitat type, substrate type, depths, etc.) and plotted on aerial maps. Also record in-situ water quality conditions (temperature, DO, pH, conductivity).

3. Prepare a report that includes a summary of the data collected. Include in the report, aerial habitat maps, habitat descriptions, project operations and flow conditions during the survey, and in-situ water quality data. Include all data used to develop the report in an appendix.

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of this work is approximately $38,000 and may be completed within one study season.

It is anticipated that two technicians and a biologist would spend about 40 hours each to conduct field work. Report preparation would require a one week by a biologist, and a GIS specialist.

Study Request #3 – Baseline Fisheries Population Study

Project: Turners Falls

Goals and Objectives

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of this study is to gather baseline fisheries data upstream and downstream of the Turners Falls dam in the Connecticut River. These data are needed to identify the fish species that occur in the Turners Falls impoundment, tailwaters, bypassed reach, and downstream riverine corridors, and to evaluate any potential project effects. Specifically, the objectives of the study are to:

1. Determine the relative abundance and distribution of resident/riverine and diadromous fish species within the Turners Falls impoundment, bypassed reach, tailwaters, and downstream riverine corridors outside of the Turners Falls Project area. This includes all areas in the Connecticut River from the upper extent of the Turners Falls impoundment and downstream to the upper extent of the Holyoke project impoundment.

2. Describe the distribution of resident/riverine and diadromous fish species within the reaches of the river and in relationship to data gathered by the Aquatic Mapping Study.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study*.

The Federal Energy Regulatory Commission must decide whether to issue a new license to FirstLight for the Turners Falls and Northfield Mountain projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued shall be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

Fish populations in the Connecticut River support a sport fishery. The effect of project operation on this resource is relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information*

Review of FirstLight's PAD, as well as a preliminary review of scientific literature revealed minimal information on fisheries resources in the Connecticut River potentially affected by the project. While sparse site-specific data on general species presence and absence are provided in the PAD, additional fisheries population data are needed to evaluate the projects effects on this resource.

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

Potential project effects on fishery resources may include fish entrainment through the generating units, minimum instream flows, and peaking flow operations. Information on the abundance and distribution of the existing fish community would help to identify whether adverse effects are occurring.

The applicant is proposing to continue providing the existing minimum flows. Flow releases (and withdrawals) from the projects have the potential to affect the suitability of aquatic habitat in these reaches, and in turn fishery resources. This requested study would help establish a baseline condition on the health of the fishery of the Connecticut River in the project vicinity under current operations. These data would also assist in informing potential license articles to protect fishery resources in the Connecticut River.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

Using generally accepted practices in the scientific community:

1. Conduct electrofishing surveys in the Turners Falls impoundment, tailwaters, bypassed reach, and downstream riverine corridor. This sampling should occur during late-summer or fall so that juvenile production for that year would be observable (juvenile fish would be large enough to collect). Sampling locations should be established to represent the full extent and types of habitat throughout the entire study area.

2. Separately target upstream and downstream migrating American eels for sampling using generally accepted methods, such as electrofishing, trap/fyke netting, eel pots, etc to provide data on the abundance of

American eels at various life stages, and where they tend to congregate, including the Northfield Mountain project's intake/tailrace. This study should occur in late spring/early summer to target upstream migration juvenile eels (i.e., elvers and yellow eels), and during the fall to target downstream migrating adults eels (i.e. silver eels).

3. Identify to species and count all collected fish while weighing and measuring only a subsample. Measure eye diameters of captured American eels for use in the evaluating silver eels phase. Identify and record the habitat type and substrate of each sampling location, and record in-situ water quality conditions (temperature, DO, pH, conductivity).

4. Prepare a report that includes a summary of the data from the above studies. Include tabular summaries of fish species collected by station, plus data on lengths, weights, condition factors, and in-situ habitat conditions. Also include specific information relating to American eel populations characteristics, such as areas at the base of the dams where elvers congregate, and the abundance of potentially downstream migrating silver eels. Include all data used to develop the report (including date and time of collection) within an appendix to the report.

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of this work is approximately $85,000, and may be completed within one study season.

It is anticipated that three technicians and a biologist would spend about 150 hours to conduct field work. Report preparation would require about 3 weeks by a biologist.

Study Request #4 – Assessment of Fish Impingement, Entrainment, and Survival Study

Projects: Turners Falls & Northfield Mountain

Goals and Objectives

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of this study is to use the data gathered from the baseline fisheries population study to assess fish trashrack impingement, turbine entrainment, and survival at the Turners Falls and Northfield Mountain projects in the Connecticut River. This information would be used to evaluate the effects from passage through project turbines and other passage routes on fish populations that occur throughout the project areas. Specifically, the objectives of the study are to:

1. Describe the physical characteristics of the Turners Falls and Northfield Mountain projects that may influence fish impingement and entrainment rates, including intake location and dimensions, the velocity distribution in front of the intake structure, and the clear spacing between the trashrack bars;

2. Identify current and any future routes for fish movement past the two projects, and the risks of injury or mortality for each, taking into consideration seasonality of movement, flow direction and velocity, and current and future flow management regimes;

3. Analyze target species (i.e., individual species and guilds/groups) for factors that may influence their vulnerability to entrainment and mortality;

4. Assess the potential for target fish species impingement;

5. Estimate entrainment rates and numbers for target fish species;

6. Estimate turbine passage survival rates and numbers for target fish species; and

7. Estimate total project survival considering all passage routes for American shad, river herring, American eel, Atlantic salmon, and sea lamprey at the Turners Falls and Northfield Mountain projects.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study*.

The Federal Energy Regulatory Commission must decide whether to issue a new license to FirstLight for the Turners Falls and Northfield Mountain projects in the Connecticut River. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued shall be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

Fish populations in the Connecticut River support a sustainable riverine ecosystem that is critical in providing public opportunities, such as the important sport fishery. Ensuring that the effect of project operations pertaining to this resource is considered in a reasoned way, is relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information*

Review of FirstLight's PAD, as well as a preliminary review of scientific literature revealed sparse and dated information pertaining to fish impingement, entrainment, and survival at the Turners Falls and Northfield Mountain projects on the Connecticut River. Additional up-to-date information on fish impingement, entrainment, and survival is needed to evaluate the projects effects on this resource.

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

Potential t effects of project operations and facilities include fish impingement on the trashracks and entrainment through the generating units. Any fish moving downstream as a part of their life cycle would encounter a series of dams and intakes at hydroelectric projects in the Connecticut River, potentially resulting in exposure of these fish to multiple sources of mortality. Information pertaining to these effects would help identify any adverse effects from the projects.

This requested study would help establish a baseline condition and be considered when evaluating the health of the fishery of the Connecticut River in the project reaches. These data would also assist in forming the basis for inclusion of potential license conditions to protect fishery resources in the Connecticut River.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

Using generally accepted practices in the scientific community:

1. Utilize the fish population data to develop a target species list that represents species of conservation interest and all fish guilds/groups in consultation with the state fishery resource agencies.

2. Conduct an assessment on the probability of trashrack impingement at two projects considering the site-specific variables at each project, such as clear spacing, intake configurations, flow velocities, fish size, fish swim speeds, and life histories.

3. Conduct a literature review of entrainment studies conducted at other hydroelectric facilities, including the EPRI (1997)[12] database to derive entrainment rates for the target species at Turners Falls and Northfield Mountain projects. Correlate entrainment rates with flow through the units of each project and the relative abundance of each target species to estimate the levels of entrainment for each target species.

4. Using the site-specific specifications from each of the two projects, conduct a blade strike assessment to derive survival rates of each target species. Correlate these survival rates with the entrainment estimates to estimate fish survival through the turbines of each of the two projects.

5. Use flow distributions through the projects turbines and other passage routes, as well as survival rates through alternative passage routes to estimate total project survival of migratory species at the Turners Falls Project.

6. Prepare a report that includes a summary of the results from the assessments described above. Include all data used to develop the report in an appendix.

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of this work is approximately $35,000. It is anticipated that a biologist and a hydrologist would spend approximately 200 hours total to conduct the impingement, entrainment, and survival assessments and prepare a report.

[12] Electric Power Research Institute (EPRI). 1997. Turbine survival and entrainment database – Field tests. EPRI Report No. TR-108630. Prepared by Alden Research Laboratory, Inc. Holden, MA.

Study Request #5 – American Shad Upstream Migration and Behavioral Study

Projects: Turners Falls & Northfield Mountain

Goals and Objectives

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of this study is to track adult American shad within the Connecticut River, through inter-project riverine reaches, project reservoirs, and project facilities and within the species' historic range. These data would be used to evaluate the effects the hydroelectric projects operations and facilities on upstream American shad passage in the Connecticut River. Specifically, the objectives of the study are to:

1. Collect and tag upstream migrating adult American shad downstream of the projects to track their migration and behavior.

2. Identify any project operations and facilities contributing to migration delay, mortality, increased predation, upstream passage avoidance, or any other project related factors contributing to alterations in natural upstream migration and behavior.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study*.

The Federal Energy Regulatory Commission must decide whether to issue a new license to FirstLight for the Turners Falls and Northfield Mountain projects in the Connecticut River. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued shall be best adapted to a

comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

American shad populations in the Connecticut River represent a valuable aquatic resource to the region, as well as a recreational and cultural resource. Identifying effects of project operations pertaining to this resource is relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information*

Review of FirstLight's PAD, as well as a preliminary review of scientific literature revealed sparse and dated information pertaining to upstream American shad migration and behavior on the Connecticut River. Although fish passage efficiency studies have been conducted within the passage facilities themselves, we are not aware of any studies on the potential effects of project operations on the migration efficiency of shad in the general project vicinity. Therefore, additional information on adult American shad migration and behavior is needed to evaluate the projects effects on this resource.

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

Potential effects of project operations at the Turners Falls and Northfield Mountain projects may influence adult American shad migration and behavior in the Connecticut River. Any adult shad moving upstream would be exposed to a series of dams and unnatural flow conditions, potentially resulting in migration delay, increased predation, and other project-related effects. Information pertaining to these effects would help identify if adverse effects from the projects are occurring.

This requested study would help identify any project-specific conditions adversely affecting upstream American shad passage conditions in the Connecticut River. These data would also assist in forming the basis for inclusion of potential license articles to protect adult American shad.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

Using generally accepted practices in the scientific community:

1. Capture upstream migrating adult American shad downstream of the projects during their upstream migration season. Telemetry tag captured American shad and record biological data before release and track their upstream migration and behavior, especially as these fish approach hydroelectric facilities. Closely monitor behavior of these shad as they approach and ascend fishways, as well as behavior within the projects impoundments.

2. Prepare a report that includes a summary of the results of the collected telemetry data. Include statistically justifiable analyses of American shad migration and behavior throughout the study area in the Connecticut River, and consider collected biological information, water quality data, river conditions, project operations and flow conditions, and the condition of project facilities during the time of the study. Also include graphics displaying the tagged-shad movements during the study. Include all data used to develop the report in an appendix.

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of this work is approximately $200,000. It is anticipated that a few technicians and a biologist would spend approximately 200 hours to conduct the field work and report. This study should be conducted over two seasons.

Study Request #6 – Recreation Facility Inventory and Use & Needs Assessment

Projects: Turners Falls & Northfield Mountain

Goals and Objectives

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goals of the Recreation Facility Inventory and Use & Needs Assessment Study are to: (1) obtain information about the condition of existing recreation facilities and access sites at the projects; and existing recreation use, access, and demand at the projects; (2) conduct an assessment of the need to enhance recreation opportunities and access at the project; and (3) develop a Recreation Management Plan for the implementation of any enhancement measures and long-term monitoring of recreation demand and adequacy of facilities at the projects over the terms of a new licenses.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study*.

The Federal Energy Regulatory Commission must decide whether to issue a license to FirstLight for the Turners Falls and Northfield Mountain Pumped Storage Hydroelectric projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the project, as well as power and developmental values. Any license issued shall be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

Recreation has been identified as a legitimate project purpose by the Commission. Applicants are encouraged to develop recreation resources in such a matter that is

"consistent with the needs of the area to the extent that such development is not inconsistent with the primary purpose of the project" (18 C.F.R. §2.7). Identifying effects of project operations pertaining to this resource is relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information*

Section 4.8.2 of the PAD provides a summary of FERC Form 80 Recreation Use Report annual visitation estimates for 2008. Section 4.8.1.1 provides a general description of public recreation facilities, activities, and demand at the projects. However, the PAD provides no detailed information regarding the condition of existing facilities or type or location of various uses. We do acknowledge that a recreation facility inventory and conditions study has taken place as referenced in the PAD Section 5.2.8.2.; however, the PAD did not display the full results from this study. The PAD provides no project-specific information regarding visitor perceptions and identified needs at the projects. Information on current use and whether existing access facilities in the area are meeting recreation demand would inform a decision on whether additional, designated public access at the projects is necessary to meet existing and future recreation demand at the projects.

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

The projects include a reservoir, tailwater areas, and a bypassed reach at Turners Falls, which are inherently attractive recreation features. Additionally, there are numerous recreational opportunities for hiking and skiing within the Northfield Mountain Project. An analysis of existing recreation use and access at the projects would help form the basis for determining the projects' ability to enhance public recreation access opportunities. Also, an assessment of the current level of recreation use would provide information necessary to develop a Recreation Management Plan for efficient management of the recreational components of the project over the term of a new license.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

1. Provide the methods and results of the investigation of the existing recreation facilities conditions, as referenced in the PAD Section 5.2.8.2. We reserve our right to request an additional inventory study if the deemed necessary.

2. At Turners Falls, the facility inventory will include characterization of the suitability of the bypassed reach for whitewater boating (e.g., gradient, length, character of potential flows) and the feasibility of incorporating a self-service portage (i.e., a path that does not require shuttle service).

3. The use and needs assessment will include all recreation activity types know to occur or potentially occurring at the project. Specific methods should include visitor observations; on-site visitor intercept surveys at formal and informal public recreation areas at the project reservoirs, tailraces, and riverine areas, including the Turners Falls bypassed reach; and mail and/or internet surveys targeting unique stakeholder groups that may not be practically accessed through on-site surveys (e.g., adjacent residential land owners, residents of the counties in which the projects are located, rock climbers, whitewater boaters).

4. Specific methods for each sampling approach in the use and needs assessment include: (1) the visitor observations should capture information such as location, date, time, weather, number of vehicles, watercraft (if any), number of recreation users or party size, and recreation activity engaged in; (2) the methodology for the visitor survey sampling will be based on a stratified random sample that includes all seasons, various locations, and various times of week and day to enable representative responses from the visitors, while ensuring interview coverage during key times (e.g., holiday and weekend days, shoulder seasons, hunting seasons) (Note: surveys of fisherman and hunters should include additional pertinent information related to game and harvest); (3) the mail back survey will

follow the Dillman Method or modified Dillman method, and include items such as frequency and duration of visits to the projects, qualitative ratings of existing public access and recreation facilities of the project area, and reasons for visiting or not visiting the projects for recreation.

5. The needs assessment will include the demand for whitewater boating in the bypassed reach of Turner Falls, existing boating opportunities within the project region (including at the project impoundments and immediately downstream of the project), feasibility of providing additional public access at the project reservoir and riverine reaches (potential locations, type of facilities and access, and any associated costs), identifying visitor perceptions regarding the adequacy of recreation facilities, and access in the project area, and assessing future recreation demand and facility needs at the project.

6. Annual recreation use by activity type and season should be quantified, to include, at a minimum, the project tailraces and the following locations: Cabot Woods Fishing Access, Turners Falls Branch Canal Area, Turners Falls No. 1 Station Fishing Access, Unity Park, Turners Falls Fishway Viewing Area, Barton Cove Natural Area and Campground, Barton Cove Canoe and Kayak Rental Area, Cabot Camp, Northfield Mountain Boat Tour and Riverview Park Area, Northfield Mountain Tour and Trail Center, Northfield Mountain Trail System, Northfield Mountain Mountaintop Observation Area, Munn's Ferry Boat Camping Recreation Area, Turners Falls Canoe Portage, and the Turners Falls bypassed reach.

7. Assess visitor perceptions of the effects of project operations and management on recreation and recreation opportunities at the project (including fluctuating reservoir levels, minimum flow releases, and anticipated changes over a new license term. Identify potential measures to alleviate any negative effects as well as to enhance existing recreation opportunities and access.

8. A Recreation Management Plan for the projects should be included in the license application and should include, at a minimum: (1) description of any proposed protection, mitigation, and enhancement measures, including: location of any proposed facilities and/or access areas (including description and figure depicting the relationship of any proposed facilities to the existing project boundaries), proposed ownership and management of

any proposed facilities, associated capital, and operation and maintenance costs; and a timeline for implementation; (2) description of operation and management measures associated with project-related recreation access and facilities; and (3) description of measures for future monitoring of recreation demand and adequacy of project-related facilities to meet this demand over the term of new licenses.

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of the Recreation Facility Inventory and Use & Needs Assessment Study for the Turners Falls and Northfield Mountain projects is about $120,000, including field studies, study report development, and drafting of a Recreation Management Plan. One field season should be sufficient to collect the required data and prepare the report.

Study Request #7 – Whitewater Boating Flow Assessment

Projects: Turners Falls

Goals and Objectives

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of this study is to assess the effects of a range of bypassed reach flows on whitewater recreational opportunities. The objectives of the study are to:

- Determine what whitewater boat-types (e.g., rafts, canoes, and kayaks) would be appropriate to utilize any potential whitewater flows in the bypassed reach.

- Determine the range of flows (minimum through optimal) needed to support various whitewater boating opportunities (by watercraft type) in the project bypassed reach.

- Determine whether current or future demand exists for whitewater boating in the bypassed reach.

- Determine the number of days per month the minimum and optimum flows for whitewater boating would be available under the project's current and any proposed mode of operation.

- Determine any competing recreational uses (e.g., climbing or fishing) or other resource needs (e.g., aquatic habitat) that may be adversely affected by any scheduled releases.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

The Federal Energy Regulatory Commission must decide whether to issue a license to FirstLight for the Turners Falls Hydroelectric Project. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the project, as well as power and developmental values. Any license issued shall be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

Comments provided during scoping indicate an interest in studying flows for boating opportunities on the 2.7-mile-long segment of the Connecticut River from Turners Falls dam to Cabot Station. Comments received stated that releasing an appropriate amount of water into the bypassed reach could potentially provide whitewater boating opportunities for public use.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information*

The PAD includes limited information on the bypassed reach in Section 3.2.1. After reviewing this information and the comments provided during the January 30 and 31, 2013 scoping meetings, we have identified a gap between existing information and the information needed to analyze whether flows could be provided to enhance whitewater boating opportunities and whether there is demand for whitewater boating in the bypassed reach. We are unaware of any information on the characteristics or boatability of the Turners Falls bypassed reach, or the range of boatable flows.

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

Project operation diverts flows from a 2.7-mile-long bypassed reach of the Connecticut River that could provide whitewater boating opportunities. Specifically, instream flows for the Connecticut River divert approximately 18,000 cfs from Turners Falls dam to Station No. 1and Cabot Station. From May 1 through approximately November 15 of each year, FirstLight maintains a seasonal minimum flow that ranging from 120 cfs to 400 cfs in the bypassed reach. These flows may be too low to accommodate whitewater boating. An analysis of project operation relative to a range of boatable flows would help form the basis for informing potential license articles pertaining to whitewater boating opportunities.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

1. Use accepted practices for a controlled flow study as described in Whittaker et al. (2005) to visually assess whitewater boating flows in coordination

with flows scheduled for the instream flow study, and any opportunities that may be provided by river flows in excess of 18,000 cfs at the Turners Falls dam; and to the extent practicable based on these visual observations, determine the acceptable minimum and optimal instream flow needed for whitewater boating in the bypassed reach.

2. Prepare a study report that (1) describes the whitewater boating attributes of the range of flows examined, including level of difficulty, portage requirements, etc; (2) identifies the acceptable and optimal flows for the reach and the frequency of availability of the identified flows under current and any proposed project operation, and (3) incorporates relevant results from the Recreation Facility Inventory and Use & Needs Assessment including characterization of the suitability of the bypassed reach for whitewater boating (e.g., gradient, length, character of potential flows), annual recreation use by activity type and season of the bypassed reach, and (4) assesses whether or not there is demand for whitewater boating in the bypassed reach.

3. The report should also describe any competing recreation uses or other resources (e.g., fishing, rock climbing) in the bypassed reach that could be adversely affected by providing scheduled releases of minimum and optimum flows for whitewater boating.

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

This study should be conducted in coordination with the instream flow study; cost of coordinating, scheduling, and providing flows to the bypassed reach should be reflected in aquatics study plan. The estimated cost of the whitewater boating flow assessment is approximately $30,000, depending upon the extent of fieldwork conducted.

Study Request #8 – Effects of Project-related Land Management Practices and Recreation Use on Terrestrial Habitats

Projects: Northfield Mountain

Goals and Objectives

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of this study is to gather the information necessary to understand the potential effects of land management practices and recreational use on wildlife and botanical resources within the Northfield Mountain Project area.[13] The objectives of the study are to:

- Identify and describe FirstLight's project-related land management practices (including the maintenance of project-related recreation areas) occurring in the Northfield Mountain project's boundary.
- Provide information pertinent to describe existing wildlife and botanical habitats occurring in the Northfield Mountain Project area.
- Determine if project-related land management and maintenance practices and the use of project-related recreation areas has the potential to facilitate the growth and spread of invasive plant species.
- Provide information to identify if project-related land management and maintenance practices and the use of project-related recreation areas may affect existing wildlife and botanical resources (e.g., clearing of vegetation).

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

[13] For the purposes of this study, the Northfield Mountain Project area includes the lands around project facilities (e.g., the upper reservoir, parking areas, access roads), and recreational areas (e.g., picnic areas, trails, hiking areas).

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study*.

The Federal Energy Regulatory Commission must decide whether to issue a new license to FirstLight for the Northfield Mountain Project in the Connecticut River Basin. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued shall be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

Wildlife and botanical resources in the Connecticut River watershed support a diverse assemblage of plant and wildlife communities that provide various public opportunities, such as bird watching, hiking, and hunting. Consideration of the effect of project operations, maintenance, land management, and recreational use on these resources is relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information*

Review of FirstLight's PAD revealed minimal information pertaining to the effects of project operation, maintenance, land management, and recreation use on wildlife and botanical habitats and the location of invasive plant species within the Northfield Mountain Project area. FirstLight is proposing to conduct wildlife and botanical study for the Turner Falls Project; however, that study only addresses the Turner Falls reservoir (lower reservoir for the Northfield Mountain Project) and not any of the other habitats associated with the Northfield Mountain Project. Additional information on the location and abundance of invasive plant species and the impacts on wildlife and botanical resources as a result of project-related maintenance and land management practices in the Northfield Mountain Project area is needed to evaluate the project's full effects on wildlife and botanical resources.

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

The Northfield Mountain Project has many recreational features (e.g., a trail system with over 26 miles of trails, observation area, picnic areas), that are inherently attractive recreation features. Public recreation sites can affect wildlife behavior (both attracting and displacing) and impact botanical resources (e.g., trampling and spreading invasive species). An analysis of the effects of the maintenance, land management practices, and use of these recreational features on wildlife and botanical resources would help form the basis for determining the project's effect on these resources.

This requested study would help establish a baseline condition for evaluating the health of the terrestrial resources of the Northfield Mountain Project area. This information would also assist in forming the basis for any potential license conditions necessary to protect wildlife and botanical resources in the project area.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

Use generally accepted practices in the scientific community to document the type and distribution of wildlife and botanical habitats (including wetlands) that are potentially impacted by project-related recreational use, maintenance, or land management practices within the Northfield Mountain Project area. Identify and describe vegetation communities and plant species, wildlife species, invasive species, and vegetation management.

Conduct field surveys with respect to floristic characterization and observations of wildlife species over the entire area affected by project operations and maintenance activities, including all recreational areas during appropriate periods. Describe invasive species occurrence and distribution in conjunction with other aspects of this study. Characterize the current extent of terrestrial weed infestations throughout the Northfield

Mountain Project area, identify the species that occur, and describe the relative abundance of these species.

Prepare a report that includes:

- A summary of the data collected, with habitat descriptions;
- A description of and assessment of the extent to which project-related actions and recreation activities may affect the spread of invasive weed populations;
- A description of project-related land management and maintenance practices, including invasive weed site information, such as population size and area;
- A map(s) of the location of wildlife and botanical resources and showing the relationship to project facilities and management and maintenance activities; and
- All data used to develop the report, in an appendix.

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of this work is approximately $50,000 - $60,000, depending upon the extent of fieldwork conducted. It is anticipated that one field biologist and one technician would spend approximately two weeks to conduct the field work and prepare a report. This cost and effort estimate considers that this study would be implemented in conjunction with FirstLight's proposed Baseline Inventory of Botanical Resources in the Turners Falls Impoundment, the Bypass Reach, and Below Cabot Station presented in section 5.2.5 of the PAD.

Document Content(s)