

FEDERAL ENERGY REGULATORY COMMISSION

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OFFICE OF ENERGY PROJECTS

Project No. 2485-063 – Massachusetts

Project No. 1889-081 – Massachusetts

FirstLight Hydro Generating Company

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

**Subject: Determination on Requests for Study Modifications and New Studies –
Turners Falls Hydroelectric Project and Northfield Mountain Pumped Storage
Project**

Dear Mr. Howard:

Pursuant to 18 C.F.R. § 5.15 of the Commission's regulations, this letter contains the determination on requests for modifications to the approved study plan for FirstLight Hydro Generating Company's (FirstLight) Turners Falls Hydroelectric Project (Turners Falls Project) and Northfield Mountain Pumped Storage Project (Northfield Mountain Project). The determination is based on the study criteria set forth in sections 5.9(b), 5.15(d) and (e) of the Commission's regulations, applicable law, Commission policy and practice, and staff's review of the record of information.

Background

The study plan determination on non-aquatic studies proposed by FirstLight in support of its relicensing of the projects was issued on September 13, 2013. A subsequent study plan determination was issued on February 21, 2014, to address the proposed aquatic studies. FirstLight filed a study report for all finalized and ongoing studies on September 16, 2014.¹ On January 22, 2015, the Commission issued a determination on requested study modifications and new studies.² FirstLight filed a study

¹ FirstLight filed final reports for studies 3.1.1 and 3.6.2.

² The determination required FirstLight to file addendums to studies 3.1.1 and 3.6.2. FirstLight filed the addendums on April 22, 2015, and June 15, 2015, respectively.

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report addressing 10 finalized studies³ and 27 ongoing studies⁴ on September 14, 2015. As required in section 5.15 of the Commission's regulations, the study report describes FirstLight's progress in implementing the approved study plan, and an explanation of variances from the study plan and schedule. FirstLight held study report meetings on September 29 and 30, 2015, and filed meeting summaries on October 14, 2015.

Comments

Comments on the study report and meeting summaries, including requests for study modifications, were filed by: the U.S. Fish and Wildlife Service (FWS); the National Marine Fisheries Service (NMFS); the National Park Service (NPS); the Massachusetts Historical Commission; the Franklin Regional Council of Governments, Connecticut River Streambank Erosion Committee (CRSEC); the Connecticut River Watershed Council (CRWC); the Nature Conservancy; the Appalachian Mountain Club (AMC); American Whitewater; New England FLOW (FLOW); Crab Apple Whitewater, Inc. (Crab Apple); Zoar Outdoor; Karl Meyer; and Peggy Hart. FirstLight filed reply comments on December 14, 2015.

A number of the comments received do not specifically request modifications to the approved studies, and are therefore not addressed herein. For example, some of the comments address the presentation of data; provide additional information; recommend protection, mitigation, and enhancement measures; address ongoing and future consultation; request information that was included in the study report; request information that FirstLight subsequently provided in its reply comments or agreed to provide in future reports; or request additional information collection that is contingent upon the results of ongoing studies. In addition, this determination does not address requests for study modifications or additional studies that have been addressed in previous Commission letters. This determination only addresses new comments and requests that would require study modifications or additional studies.

Study Plan Determination

³ Finalized studies include studies 3.2.2, 3.3.14, 3.3.17, 3.3.18, 3.4.2, 3.6.3, 3.6.4, 3.6.7, 3.7.2, and 3.7.3. FirstLight filed the report for study 3.7.2 on December 31, 2014, filed a revised report on July 22, 2015, and filed an addendum to the report on November 16, 2015.

⁴ FirstLight filed a Phase 1A archaeological survey report for study 3.7.1 on December 31, 2014, and filed a revised report on May 15, 2015. However, the Commission's September 13, 2013, study plan determination required FirstLight to also conduct Phase 1B and Phase 2 surveys; therefore, this study is still ongoing.

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Pursuant to section 5.15(d) of the Commission's regulations, any proposal to modify a required study must be accompanied by a showing of good cause, and must include a demonstration that: (1) the approved study was not conducted as provided for in the approved study plan, or (2) the study was conducted under anomalous environmental conditions or that environmental conditions have changed in a material way. As specified in section 5.15(e), requests for new information gathering or studies must include a statement explaining: (1) any material change in law or regulations applicable to the information request, (2) why the goals and objectives of the approved study could not be met with the approved study methodology, (3) why the request was not made earlier, (4) significant changes in the project proposal or that significant new information material to the study objectives has become available, and (5) why the new study request satisfies the study criteria in section 5.9(b).

As indicated in Appendix A, modifications to three studies (3.3.3, 3.3.5, and 3.3.7) are approved. The requested modifications to six studies (3.1.2, 3.2.2, 3.3.17, 3.3.18, 3.6.3, and 3.6.4), and the requested new study of shortnose sturgeon spawning at the Rock Dam pool in Turners Falls are not approved. The specific modifications to the studies and the basis for modifying or not modifying the study plan are explained in Appendices B (Requested Modifications to Approved Studies) and C (Requested New Studies). Commission staff considered all study plan criteria in section 5.9 of the Commission's regulations.

Please note that nothing in this determination is intended, in any way, to limit any agency's proper exercise of its independent statutory authority to require additional studies.

Additional Information

In reply comments filed on December 14, 2015, FirstLight states that it will file addendums to finalized studies 3.2.2 and 3.3.18 to address requests for additional information. However, FirstLight does not address a number of requests for information to be included in future reports. In the study report due on March 1, 2016,⁵ FirstLight must include the addendums to studies 3.2.2 and 3.3.18 or indicate when the addendums will be filed with the Commission. In addition, FirstLight's March 1, 2016, filing must respond to all outstanding information requests by either: (1) providing the requested information, (2) indicating when the information will be provided to stakeholders, or (3) indicating why the information will not or cannot be provided to stakeholders.

Proposed Project Operation

⁵ See the revised process plan and schedule issued on September 14, 2015.

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On November 12, 2015, NMFS requested that the Commission modify studies 3.1.2 and 3.8.1 if FirstLight proposes a change in project operation in the draft or final license application. On December 2, 2015, in its draft license application, FirstLight proposed to increase the useable storage volume of the upper reservoir at the Northfield Mountain Project.⁶ FirstLight acknowledges that additional analysis is needed on the associated effects of this proposed change on water surface elevations in the Turners Falls impoundment (i.e., the lower reservoir). Therefore, in its March 1, 2016, filing, FirstLight must address any necessary changes to the approved study plan and describe any additional analyses it will perform to address the proposed change in the operation of the Northfield Mountain Project. After review of FirstLight's proposal and any comments from stakeholders, Commission staff will revise the approved study plan, if necessary, in the study modification letter scheduled to be issued on June 29, 2016.⁷

If you have any questions, please contact Brandon Cherry at (202) 502-8328, or via e-mail at brandon.cherry@ferc.gov.

Sincerely,

Ann F. Miles
Director
Office of Energy Projects

Enclosures: Appendix A – Summary of Determinations on Requested Modifications to Approved Studies and New Studies
Appendix B – Staff's Recommendations on Requested Modifications to Approved Studies
Appendix C – Staff's Recommendations on Requested New Studies

cc: Mailing List, Public Files

⁶ FirstLight proposes to increase the maximum water surface elevation from 1,000.5 feet mean sea level (msl) to 1,004.5 feet msl and decrease the minimum water surface elevation from 938 feet msl to 920 feet msl year-round.

⁷ See the revised process plan and schedule issued on September 14, 2015.

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Appendix A

APPENDIX A**SUMMARY OF DETERMINATIONS ON REQUESTED: MODIFICATIONS TO
APPROVED STUDIES AND NEW STUDIES****Requested Modifications to Approved Studies (see Appendix B for discussion)**

Study	Recommending Entity	Adopted	Adopted in part	Not Adopted
3.1.2 – Northfield Mountain/Turners Falls Operations Impact on Existing Erosion and Potential Bank Instability	CRSEC, CRWC, NMFS			X
3.2.2 – Hydraulic Study of Turners Falls Impoundment, Bypassed Reach, and the Connecticut River below Cabot Station	CRWC			X
3.3.3 – Evaluate Downstream Passage of Juvenile American Shad	FWS, NMFS, the Nature Conservancy, CRWC, FERC	X		
3.3.5 – Evaluate Downstream Passage of American Eel	FWS, NMFS, the Nature Conservancy, CRWC, FERC	X		
3.3.7 – Fish Entrainment and Turbine Passage Mortality Study	FWS, NMFS, the Nature Conservancy, CRWC, FERC	X		
3.3.17 – Assess the Impacts of Project Operations of the Turners Falls Project and Northfield Mountain Project on Tributary and Backwater Area Access and Habitat	FWS			X
Study 3.3.18 – Impacts of the Turners Falls Canal Drawdown on Fish Migration and Aquatic Organisms	FWS, CRWC, Karl Meyer			X
3.6.3 – Whitewater Boating Evaluation	NPS, American Whitewater, AMC, FLOW, Crab Apple, Zoar Outdoor			X
3.6.4 – Assessment of Day Use and Overnight Facilities Associated with Non-Motorized Boats	NPS, AMC, CRWC			X

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Requested New Studies (see Appendix C for discussion)

Study	Recommending Entity	Approved	Approved with Modifications	Not Required
Tagging and Spawning Study of Connecticut River Shortnose Sturgeon at the Rock Dam Pool in Turners Falls	Karl Meyer			X

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APPENDIX B

STAFF'S RECOMMENDATIONS ON REQUESTED MODIFICATIONS TO APPROVED STUDIES

Study 3.1.2 – Northfield Mountain/Turners Falls Operations Impact on Existing Erosion and Potential Bank Instability

Background

The goal of the study is to identify and evaluate causes of erosion in the Turners Falls impoundment. The causes of erosion within the impoundment will be identified by: (1) conducting a literature review and identifying data gaps; (2) developing a geomorphic understanding of the Connecticut River within the Turners Falls impoundment; (3) performing field studies based on the data gaps that are identified; and (4) analyzing the data collected. A final report has not been filed for study 3.1.2.

Trends in Bank Position

Requested Study Modifications

The Franklin Regional Council of Governments, Connecticut River Streambank Erosion Committee (CRSEC), and Connecticut River Watershed Council (CRWC) request that FirstLight analyze historical aerial photographs to identify trends in bank position over time using a methodology similar to that presented in the 1991 Connecticut River Riverbank Management Plan (Riverbank Management Plan).⁸

Comments on Requested Study Modifications

FirstLight states that it does not intend to use the quantitative approach for studying trends in bank position presented in the Riverbank Management Plan. Alternatively, FirstLight is proposing to conduct a qualitative review of historic bank positions using various aerial imagery datasets.

Discussion and Staff Recommendation

In its September 13, 2013, study plan determination (SPD), the Commission required that FirstLight compare available historical mapping and survey data against more recent aerial imagery to analyze trends in bank position within the Turners Falls impoundment. Based on the information provided in the September 14, 2015, study

⁸ 1991. Connecticut River Riverbank Management Master Plan (Draft). Northrop, Devine & Tarbell, Inc., Portland, ME. June 1991.

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report, FirstLight's approach for analyzing historic bank position trends is consistent with the study required by the Commission's SPD. However, Commission staff intends to carefully review the findings of the geomorphic assessment when the final study report is available. If the final study report does not satisfy the study objectives, additional information or analysis may be needed.

Boat Wave Data

Requested Study Modifications

CRSEC and CRWC object to the variance in methodology for collecting and analyzing boat wave data.⁹ CRSEC and CRWC state that using data collected in 2015 to extrapolate the prior 14-year period will misrepresent the effect of boat waves on erosion. CRSEC, CRWC, and National Marine Fisheries Service (NMFS) recommend performing a sensitivity analysis on the data collected.

Comments on Requested Study Modifications

FirstLight indicates that additional data, including regional and national boat traffic information and historic rainfall patterns will be used to supplement the boat wave data analysis. FirstLight states that a full discussion of the data collected, methodology used, model sensitivity, and results will be included in the final report.

Discussion and Staff Recommendation

FirstLight indicates that boat wave data collected and analyzed in 2015 will be used to supplement its Bank Stability and Toe Erosion (BSTEM) Model. Expanding the BSTEM model to include a boat wave sub-model will provide a more complete representation of streambank erosion within the Turners Falls impoundment and will help Commission staff and stakeholders identify, understand, and address possible environmental effects. Further, the expansion of the BSTEM model is being performed in conjunction with the approach for evaluating boat wave data presented in FirstLight's revised study plan (RSP). Therefore, the Commission staff does not recommend any study modifications at this time. However, as noted by FirstLight, the BSTEM model historically has not been used to evaluate sheer wave stress associated with boat waves and may mischaracterize the types of erosion occurring within the Turners Falls impoundment. Therefore, Commission staff will carefully review the results of the BSTEM model and the final study report to ensure the modified boat wave analysis does not skew or misrepresent the erosional processes occurring within the Turners Falls impoundment. If the results of BSTEM model and the final study report appear to skew

⁹ See section 5.15 of the Commission's regulations.

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or misrepresent erosional processes, additional information, data collection, or analysis may be needed.

3.2.2 – Hydraulic Study of Turners Falls Impoundment, Bypassed Reach, and the Connecticut River below Cabot Station

Background

The goal of study 3.2.2 is to simulate water surface elevations and mean channel velocities for a range of operational scenarios under steady-state (constant flow) and unsteady-state (time-varied flow) conditions to determine the impacts of operating the Turners Falls and Northfield Mountain Projects on water level fluctuations in the Connecticut River. The simulation was developed using the United States Army Corps of Engineers' one-dimensional Hydrologic Engineering Centers River Analysis System (HEC-RAS) hydraulic model. The results of the hydraulic model will support the assessment of project effects in several other study areas, including environmental, geologic, and recreational resources.

Requested Study Modifications

CRWC requests that the study report be revised to include more discussion and analyses of model input data, including water level observations and flow data. CRWC also requests that the study report show simulated water levels and mean channel velocities for the sample stations in the Northfield Mountain tailrace and at the Turners Falls dam. Finally, CRWC requests that the graphs of simulated results be plotted at a smaller time interval than the 12-hour interval used in the study report. CRWC indicates that this information would be useful in understanding the degree and magnitude of water level fluctuations and their impacts on streambank erosion and recreation within the study reaches.

Comments on Requested Study Modifications

FirstLight did not respond to CRWC's requests.

Discussion and Staff Recommendation

Because the study results satisfy the study objectives (section 5.9(b)(1)) and the information collected should be adequate for staff's analysis and development of any license requirements (section 5.9(b)(5)), we do not recommend modifying the study to require that FirstLight provide the information requested by CRWC. However, we note that task 8 of the approved study plan states that FirstLight, upon request, will provide interested stakeholders with the HEC-RAS data files. The HEC-RAS data files, including data entered into the model and data calculated by the model, would provide

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the information requested by CRWC, or at least provide the data that could be used to calculate the requested information. Therefore, CRWC should be able to obtain the information by requesting and analyzing the information in the HEC-RAS data files.

3.3.3, 3.3.5, and 3.3.7 – Fish Entrainment Studies

Background

Studies 3.3.3, 3.3.5, and 3.3.7, which were required by the Commission's February 21, 2014, SPD, include evaluation of the effects of the Northfield Mountain Project's pumping operations on the downstream migration of juvenile shad and adult eels. Studies 3.3.3 and 3.3.5 include field sampling while the Northfield Mountain Project is operating all four pump-turbines in pumping mode. The data collected during these studies is to be used to estimate entrainment and mortality in study 3.3.7. However, because one of the Northfield Mountain Project's pump-turbines was removed from service on August 31, 2015,¹⁰ the Northfield Mountain Project could not operate more than three pump-turbines in pumping mode during sampling for studies 3.3.3 and 3.3.5 in 2015. Final reports have not been filed for studies 3.3.3, 3.3.5, and 3.3.7.

Comments on Study Variance

NMFS and the U.S. Fish and Wildlife Service (FWS) indicate that after review of the final study results, they may request an additional year of study that includes data collection when all four pump-turbines are operating in pumping mode. CRWC and the Nature Conservancy state that FirstLight should acknowledge that not operating all four pump-turbines in pumping mode during field sampling is a variance from the study plan. The Nature Conservancy also requests that FirstLight describe how it would fulfill the objectives of Studies 3.3.3, 3.3.5, and 3.3.7 without collecting field data during operation of all four pump-turbines in pumping mode.

Reply Comments on Study Variance

FirstLight acknowledges that not operating all four pump-turbines in pumping mode during sampling is a variance from the study plan. However, FirstLight indicates that it would like to review the results of the studies before determining if additional sampling during operation of all four pump-turbines in pumping mode is necessary.

Discussion and Staff Recommendation

¹⁰ See FirstLight's June 16, 2015, letter, which indicates that Unit 1 will not return to operation until mid-February 2016.

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Not operating all four pump-turbines in pumping mode during the field sampling required by studies 3.3.3 and 3.3.5 is a variance from the approved study plan; however, additional sampling may not be necessary if FirstLight can derive a statistically valid approach for extrapolating to four pump-turbine pumping operation based on the data collected during pumping operation of the three available pump-turbines. In its final report for studies 3.3.3 and 3.3.5, FirstLight should provide a detailed description of any calculations used to derive estimates of fish entrainment during four pump-turbine pumping operation, including a list of assumptions and support for such assumptions (i.e., statistical analysis, literature review, analysis of velocity profiles from Study 3.3.9¹¹ and observed entrainment, or analysis of the relationship between intake flow or velocity and entrainment rates from other power plants). To the extent possible, FirstLight should also include confidence intervals or other descriptions of the variance and uncertainty associated with any estimates of entrainment during operation of four pump-turbines in pumping mode.

Study 3.3.17 – Assess the Impacts of Project Operations of the Turners Falls Project and Northfield Mountain Project on Tributary and Backwater Area Access and Habitat.

Background

The purpose of study 3.3.17 is to determine if project-related water level fluctuations at the Turners Falls and Northfield Mountain Projects create movement barriers and/or alter available habitat upstream and downstream of the projects. The study objectives include: (1) identifying potential barriers or constrictions of fish access to tributaries and backwater areas resulting from project-related water level fluctuations; and (2) measuring changes to available habitat and water quality in tributaries and backwater areas resulting from project-related water level fluctuations.

Requested Study Modifications

FWS requests that FirstLight re-analyze the data for potential barriers to fish movement based on the criterion specified in the RSP. The RSP specified that access should be evaluated using a criterion of 1-foot water depth or less, rather than the 0.5-foot depth that FirstLight used in the final report. FWS also requests that the list of resident

¹¹ Study 3.3.9, *Two-dimensional Modeling of the Northfield Mountain Pumped Storage Project Intake/tailrace Channel and Connecticut River Upstream and Downstream of the Intake/tailrace*, will provide estimates of water surface elevations and water velocity profiles for the Connecticut River near the Northfield Mountain Project for different river flow and project operating scenarios, including the operation of all four pump-turbines in pumping mode.

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fish species included in the final report include average body depth for each species that was evaluated.

Comments on Requested Study Modifications

In its response, FirstLight states that because many of the surveyed tributaries are less than 1-foot deep and average body depths for the species occurring in the project area are generally significantly less than 1 foot, using a 0.5-foot depth criterion to evaluate access is more appropriate and meaningful than using the 1-foot criterion. FirstLight offers support for this criterion by citing two sources (Smith, C.L. 1985 and Bovee 1982).

Discussion and Staff Recommendation

The streambed elevation data and water surface elevation data collected during the study allow for an analysis of potential stream barriers using a 0.5-foot or 1-foot access criterion. The tabular data and graphics presented in the final report provide a means of interpreting the change in water depths in the studied habitats over various seasons and project operation scenarios. As noted by FirstLight, published data on species-specific fish body depths are readily available (see Smith, C.L. 1985 and Bovee 1982). In the final report, FirstLight has identified and discussed sites that it believes constitute barriers using its criteria; however, the information included in the final report combined with available literature is adequate to allow Commission staff and stakeholders to apply different criteria and determine if there may be additional barriers. Because the study results satisfy the study objectives (section 5.9(b)(1)) and the information collected is adequate for staff's analysis and development of any license requirements (section 5.9(b)(5)), we do not recommend re-evaluating the data using the 1-foot criterion.

Study 3.3.18 – Impacts of the Turners Falls Canal Drawdown on Fish Migration and Aquatic Organisms

Background

FirstLight annually dewateres the Turners Falls power canal for several consecutive days to allow for inspection and maintenance of the power canal and facilities. The objectives of study 3.3.18 included documenting species presence after the canal drawdown, estimating relative abundance, determining the status of observed aquatic organisms, and evaluating measures to minimize effects. To assess the effects of the canal drawdown, FirstLight conducted two surveys of fish and other aquatic organisms (e.g., freshwater mussels and mudpuppies) while the power canal was dewatered. One survey was conducted immediately after dewatering and a second survey was conducted immediately prior to rewatering. The study plan required that each survey include

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electrofishing and seining pools with depths greater than 6 inches, meander surveys¹² to locate and identify any stranded organisms, and excavation of approximately 30 quadrats for mussels and larval and juvenile sea lamprey.

FirstLight conducted the study from September 29 to October 3, 2014. After the canal was dewatered and again before it was rewatered, FirstLight seined and electrofished 14 pools, identified and photographed stranding locations, and excavated 32 1-square-meter quadrats. All organisms collected during the surveys were enumerated in the final report.

Additional Fish Survey

Requested Study Modifications

Karl Meyer observed the subsequent canal drawdown in 2015 and reports that there were stranded fish in areas far from the canal thalweg.¹³ Mr. Meyer suggests that because much of the sampling occurred near the canal thalweg during the 2014 survey, the study underestimated the drawdown-related mortality. Therefore, Mr. Meyer requests that FirstLight repeat the study in 2016 and include areas outside of the thalweg in the meander surveys.

Comments on Requested Study Modifications

FirstLight states that staff working in the canal during the 2015 drawdown did not observe stranded fish as reported by Mr. Meyer. Additionally, FirstLight states that the 2014 study provided sufficient information to develop measures to minimize the effects of a canal drawdown on aquatic organisms, and an additional year of study is unnecessary.

Discussion and Staff Recommendation

The objective of this study was not to estimate the absolute number of fish stranded by canal dewatering or describe annual variation in aquatic species trapped in the canal during dewatering. Instead, the objectives of the study were to document species presence after the canal drawdown, estimate relative abundance, determine the

¹² To conduct the meander survey, the survey crew would walk through each section of the power canal in a wandering fashion while visually identifying and examining areas where fish and other aquatic organisms could become stranded following the drawdown.

¹³ The thalweg is a line connecting the lowest points of river channel. After the canal was dewatered, a series of connected pools remained in the canal thalweg.

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status of observed aquatic organisms (i.e., stranded, alive, dead), and to map wetted areas. Because the study results satisfy these objectives (section 5.9(b)(1)) and the information collected is adequate for staff's analysis and development of any license requirements (section 5.9(b)(5)), we do not recommend repeating the study in 2016.

Stranded Fish Data and Extrapolating Fish Mortality

Requested Study Modifications

CRWC requests that FirstLight provide information about the species and number of fish observed in each stranding location. CRWC also requests that FirstLight extrapolate the mortality observed during the pool surveys to the entire canal drawdown for each fish species.

Comments on Requested Study Modifications

FirstLight did not respond to CRWC's request for the additional stranding information.

In response to CRWC's other request, FirstLight states that extrapolating the mortality observed during the pool surveys to the entire canal drawdown is not possible because the number of fish present in the canal at the beginning of the drawdown is unknown. FirstLight also states that fish congregate in the pools as the canal is drawn down, which artificially inflates any estimates of fish density. Therefore, extrapolating the fish densities observed in the pools to the entire canal would greatly overestimate the number of fish in the canal.

Discussion and Staff Recommendation

As mentioned above, the objectives of the study were to map wetted areas in the canal and document the relative abundance and status of aquatic organisms present in the canal after drawdown. However, both of CRWC's requests focus on attempting to estimate the number of fish that die during the annual canal drawdown which was not an objective of study 3.3.18. The number of fish stranded and the mortality rates for aquatic organisms in the pools likely varies from year to year for reasons unrelated to project operation, such as annual variations in abundance of the species in the project area, air temperature¹⁴ during the drawdown, river conditions prior to the drawdown, and the

¹⁴ Warmer air temperatures would result in faster desiccation of any stranded organisms. Additionally, warmer air temperatures would result in warmer water temperature in the pools and lead to faster depletion of dissolved oxygen in the pools because fish respiration rates increase and dissolved oxygen concentration decrease with increased water temperature.

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number of piscivorous birds present during the drawdown. For these reasons, as well as the reasons provided by FirstLight, obtaining a precise mortality estimate is likely not possible or necessary for staff's environmental analysis. Because the study results satisfy the study objectives (section 5.9(b)(1)) and provide the information required for staff's analysis and the development of any license requirements (section 5.9(b)(5)), we do not recommend requiring FirstLight to conduct any additional analysis of the collected information.

Additional Sea Lamprey and Mudpuppy Surveys

Requested Study Modifications

In communications sent to FWS and CRWC, Dr. Boyd Kynard¹⁵ states that: (1) he observed similar numbers of stranded sea lamprey during the drawdowns that occurred in 2011 and 2014 (i.e., thousands);¹⁶ (2) excavating quadrats is an inappropriate method for quantifying the number of larval and juvenile sea lamprey and mudpuppies¹⁷ in the canal; and (3) any survey of sea lamprey or mudpuppy abundance in the canal must sample the preferred habitat of these organisms.¹⁸ Based on Dr. Kynard's comments, FWS and CRWC request another year of study to collect additional abundance data on sea lamprey and mudpuppies.

Comments on Requested Study Modifications

FirstLight responds that it developed the study plan, including the use of quadrats, in consultation with stakeholders and conducted the study as required by the SPD. Additionally, FirstLight states that Dr. Kynard entered the canal about five hours before the drawdown was completed. FirstLight indicates that when survey crews entered the canal after the drawdown was completed, they did not observe large numbers of stranded sea lamprey. Based on this information, FirstLight states that it should not be required to conduct any additional studies.

¹⁵ Dr. Kynard is a migratory fish behavior expert and former USGS Conte Anadromous Fish Research Laboratory (Conte Lab) employee.

¹⁶ In its December 14, 2015, letter, FirstLight reported observing only "a few" stranded sea lamprey during the 2014 canal drawdown.

¹⁷ Mudpuppies are large aquatic salamanders that are often found in rivers near large woody debris or large rocks.

¹⁸ See Dr. Kynard's comments in Attachment 2 of CRWC's November 13, 2015, comment letter.

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Discussion and Staff Recommendation

Deriving exact estimates of the numbers of sea lampreys and mudpuppies in the power canal after drawdown was not an objective of study 3.3.18. In addition, this information is not necessary for staff's analysis or development of license conditions. However, to evaluate the effects of the canal drawdown on sea lampreys and mudpuppies, staff will consider all available information, including the results of study 3.3.18, the sea lamprey and mudpuppy habitat information provided by Dr. Kynard, data from the 2011 drawdown study, information from peer-reviewed publications and agency reports, and any other relevant information provided by the other studies being conducted by FirstLight. Because the study achieved the objectives (section 5.9(b)(1)) and the study results in combination with other existing information will be adequate for staff's analysis and development of license requirements (section 5.9(b)(5)), we do not recommend repeating the study in 2016.

3.6.3 – Whitewater Boating Evaluation

Background

FirstLight conducted a controlled flow study in the Turners Falls bypassed reach to identify minimum and optimum flows for whitewater boating. One of the goals of the study was to determine the number of days per month that minimum and optimum flows for whitewater boating are available under the project's current and any proposed mode of operation. Another goal of the study was to identify the need for and define access points for whitewater boating.

Analysis of Mode of Operation

Requested Study Modifications

American Whitewater; Appalachian Mountain Club (AMC); New England FLOW (FLOW); Crab Apple Whitewater, Inc. (Crab Apple); Zoar Outdoor; and the National Park Service (NPS) state that FirstLight only examined the availability of recreational flows (minimum and optimal) under the current mode of operation, and it should conduct additional analysis of alternative modes of operation.

Comments on Requested Study Modifications

FirstLight states that the approved study plan only required them to analyze flows for whitewater boating that would be available under the project's current and any proposed modes of operation. FirstLight suggests that because it is not proposing any alternative modes of operation, the study has been completed as required.

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Discussion and Staff Recommendation

At this time, no entities have proposed alternative modes of project operation or specific whitewater boating flows for the bypassed reach; therefore, FirstLight has completed the study as required. If specific whitewater boating flows are recommended in the future, Commission staff's analysis will include: (1) a description of the range of acceptable whitewater boating flows, including minimum and optimum flows; and (2) estimates of the cost of releasing whitewater flows into the bypassed reach (i.e., the value of any lost generation). Study 3.6.3 provides adequate information describing minimum and optimum whitewater boating flows in the bypassed reach and Exhibits B and D of the final license application (see sections 4.51(c) and (e) of the Commission's regulations) should include the information needed to estimate the cost of any whitewater boating flows. Therefore, staff do not recommend requiring FirstLight to conduct additional analysis of currently unspecified alternative modes of operation as part of study 3.6.3.

*Access to Bypassed Reach*Requested Study Modifications

American Whitewater, AMC, FLOW, Crab Apple, Zoar Outdoor, and NPS state that FirstLight's examination of suitable access sites should not be limited to existing conditions, and instead should consider if suitable access can be provided with appropriate improvements. These stakeholders identify Cabot Woods Fishing Access, the Fishway Put-in, and the Poplar Street Access Site as areas that need additional study for improvements.¹⁹

Comments on Requested Study Modifications

FirstLight states that the study plan only required it to identify and define adequate access points and did not require it to develop specific improvement proposals.

Discussion and Staff Recommendation

Study 3.6.3 adequately describes the Cabot Woods Fishing Access, the Fishway Put-in, and the Poplar Street Access Site, including the shortcomings of each site. This information should be adequate for Commission staff's analysis of the need for, and benefit of, any improvements that may be recommended for these sites and development of any license requirements (section 5.9(b)(5)); therefore, Commission staff do not recommend requiring FirstLight to conduct additional analysis of potential improvements

¹⁹ Cabot Woods Fishing Access is an existing project recreation facility; the Fishway Put-in is not an existing recreation area; and the Poplar Street Access Site is an existing non-project recreation area.

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to the Cabot Woods Fishing Access, the Fishway Put-in, and the Poplar Street Access Site.

3.6.4 – Assessment of Day Use and Overnight Facilities Associated with Non-Motorized Boats

Background

FirstLight conducted an assessment of day use and overnight facilities associated with non-motorized boats at the Northfield Mountain and Turners Falls Projects. The goal of the study was to assess the availability and quality of access sites and facilities (i.e., campsites and portage trails) for recreational ‘through paddlers’ along the Connecticut River. The objectives of this study included identification of walkable portage routes around the Turners Falls dam and a determination of the need for new facilities or improvements to existing facilities to meet current or future recreation needs.

Portage Trail

Requested Study Modifications

NPS, AMC, and CRWC request that FirstLight study a portage trail that puts in directly downstream of Turners Falls dam.

Comments on Requested Study Modifications

FirstLight states that it evaluated two new feasible walking-portage routes. Both routes are more than 3 miles long and would include a take-out on the Turners Falls impoundment and a put-in at the Poplar Street Access Site downstream of the bypassed reach. FirstLight states that providing a put-in immediately downstream of the dam, as requested by stakeholders, may be potentially hazardous and present safety concerns.

Discussion and Staff Recommendation

As part of study 3.6.4, FirstLight evaluated a 3.08-mile-long portage route with a take-out at Unity Park on the south side of the impoundment and a put-in at the Poplar Street Access Site. This new option is designed to be an improvement over the existing informal option of a 3.80-mile-long portage route with a take-out at Barton Cove on the north side of the impoundment and a put-in at the Poplar Street Access Site. Both routes put-in downstream of the bypassed reach, thereby eliminating the potential to boat this reach. However, both portage routes pass directly by the Fishway Put-in, which is on the south side of the bypassed reach immediately downstream of the dam. Because the information included in study 3.6.4 is adequate for staff’s analysis of several possible portage routes between the Turners Fall impoundment and below and above the bypassed

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reach (section 5.9(b)(5)), Commission staff do not recommend requiring FirstLight to do additional analysis of portage routes between the impoundment and bypassed reach as part of study 3.6.4. If necessary, Commission staff will request additional information in the future regarding public safety at access sites.

Poplar Street Launch Improvements

Requested Study Modifications

NPS, AMC, and CRWC request that FirstLight study specific solutions to the problems (e.g., inadequate parking, steepness of the bank) at the Poplar Street Access Site, including assessing the feasibility of obtaining a privately owned site directly upstream of Poplar Street Access Site or alternative sites. AMC states that FirstLight could alternatively produce a site improvement plan for the Poplar Street Access Site.

Comments on Requested Study Modifications

FirstLight states that the approved study plan did not require the development of a site improvement plan, and instead only required identification of potential improvements, which it identified in study 3.6.4. FirstLight states that obtaining access to or possession of private land to access the bypassed reach is a protection, mitigation, and enhancement measure (PM&E) and will be addressed in the final license application.

Discussion and Staff Recommendation

The information provided in studies 3.6.3 and 3.6.4 describes the Poplar Street Access Site and study 3.6.4 lists several potential improvements to this site. While development of a site improvement plan and/or investigating the feasibility of obtaining access to private lands would be useful for the development of PM&E measures, this information is not needed for staff's analysis or development of license requirements (section 5.9(b)(5)). Therefore, Commission staff do not recommend any additional analysis as part of study 3.6.3 or 3.6.4.

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APPENDIX C

STAFF'S RECOMMENDATIONS ON REQUESTED NEW STUDIES

New Study Request: Tagging and Spawning Study of Connecticut River Shortnose Sturgeon at the Rock Dam Pool in Turners Falls

Requested New Study

Karl Meyer requests a new study of shortnose sturgeon spawning success at the Rock Dam pool downstream of the Turners Falls dam. Mr. Meyers states that construction of new fish passage facilities at Holyoke Dam (downstream of the Turners Falls Project) and "test flow evaluations" in the Turners Falls Project's bypassed reach present a unique opportunity for studying shortnose sturgeon spawning success. Mr. Meyer does not describe the goals and objectives (section 5.9(b)(1)), describe existing information and need for additional information (section 5.9(b)(4)), explain how the study would inform the development of license conditions (section 5.9(b)(5)), describe the study methodology (section 5.9(b)(6)), or describe the level of effort and cost (section 5.9(b)(7)).

Comments on Requested New Study

FirstLight explains that the spawning behavior and habitat criteria of shortnose sturgeon have been adequately studied, including in the Rock Dam pool area, and that a good summary of available data can be found in Kynard, et al. (2012). FirstLight also states that the available literature combined with the IFIM study being conducted by FirstLight will provide adequate information for completing National Environmental Policy Act and Endangered Species Act analysis of potential effects on shortnose sturgeon.

Discussion and Staff Recommendation

Existing information about shortnose sturgeon spawning behavior and habitat requirements, much of it developed from studies conducted in the project area (Kynard, et al. 2012), is substantial and can be used in Commission staff's analysis of project effects on shortnose sturgeon. In addition, the IFIM study being conducted by FirstLight will provide information that can be used to evaluate instream flow requirements for protecting shortnose sturgeon at the project. Because existing information combined with the results of FirstLight's ongoing studies should be adequate for staff's analysis and development of any license requirements (section 5.9(b)(5)), we do not recommend conducting a tagging study to determine shortnose sturgeon spawning success in the Rock Dam pool area of the Turners Falls Project.

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