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

AUG 28 2013

Electronically Filed - 8/28/13

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

RE: Comments on Firstlight's Revised Study Plan dated August 14, 2013 for Turners Falls (P-1889) and Northfield Mountain Pumped Storage (P-2485)

Dear Ms. Bose:

We have reviewed the revised study plan dated August 14, 2013, that Firstlight has developed for its two projects on the Connecticut River. Firstlight has responded to many of the comments on the updated proposed study plan that we submitted July 15, 2013. Our detailed comments pertaining to outstanding issues and clarification are attached to this letter.

If you have any questions or need additional information, please contact Bill McDavitt (William.Mcdavitt@noaa.gov) or 978-675-2156.

Sincerely,

Louis A. Chiarella
Assistant Regional Administrator
for Habitat Conservation

cc: service list

National Marine Fisheries Service Comments
of August 29, 2013, on Firstlight's Revised Proposed Study Plans
for Turners Falls (P-1889) and Northfield Mountain Pumped Storage (P-2485)
as filed August 14, 2013

3.1.1. 2013 Full River Reconnaissance (FRR)

Task 4c Georeferenced video

We ask that a semi-quantitative classification approach be employed such that a channel stability index can be created from these data. If it is possible to conduct a similar approach with the 2008 georeferenced video that was collected as part of the 2008 FRR, we recommend that such efforts be conducted. We request that a percent reach failure from the data that are collected under this task be developed using the georeferenced video data.

3.1.2. Northfield Mountain/Turners Fall Operations Impact on Erosion and Potential Bank Instability

Task 5: Data analysis

This section states that potential primary causes of erosion will include water level fluctuations due to hydropower operations. Further into this section, the text states "by running (the BSTEM) model with and without water level fluctuations or with and without flowing water, as well as with a range of sediment strength and erosion parameters, an understanding of the relative contribution of various causes of erosion will be developed." Broadly speaking, we support this process based approach. We ask that as the analysis proceeds, further discussion between Firstlight, its hired experts and interested stakeholders ensues. We would also like to better understand exactly which time series data sets will be used and over what time periods. It is our understanding that when a time series dataset is coupled with BSTEM, an estimate of the amount of scour or cross sectional area in eroded from the bank can be generated. This output can in turn be developed into a volume and then a tonnage knowing the distance between sections, corrections from the data collected in the Full River Reconnaissance, and assumed densities. We would welcome an analysis that estimates annual erosion rates (tons of sediment per year) that were generated from unimpacted flows, peaking operations from Vernon only, and peaking operations from Northfield Mountain only, and under current operating conditions.

This section points out that a steady state HEC-RAS and RIVER 2D model exist for the headpond. It also states "The HEC-RAS model will be used to 1) simulate a range of flows and different downstream boundary conditions." It is not clear if a series of steady state discharge values will be entered into RAS, or if an unsteady analysis will be used whereby time series data are entered. We recommend further consultation on which flows will be used for this analysis.

We also note that the revised study plan (RSP) clearly has substantially more specificity than the previous proposed study plans. However, one area of detail that is lacking from the proposal is any mention of root resistance. Embedded into the BSTEM model is another model called RIPROOT. In order for RIPROOT to be executed, information on the types of riparian species

and their associated root properties needs to be collected. Simon and Collison (2002) clearly pointed out the mechanical and hydrologic effects of riparian vegetation on streambank stability and the data necessary to make such assessments. We recommend that requisite root data be collected for the most dominant four or five species in the area, such that RIPROOT can be fully executed to the maximum extent possible, field data specific to a given species are used and assumed values for a given parameter are minimized.

Simon, Andrew and Collison, Andrew J.C. 2002. Quantifying the Mechanical and Hydologic Effects of Riparian Vegetation on Streambank Stability. Earth Surface Processes and Landforms. V27, p. 527-546. DOI: 10.1002/esp.325

3.2.2 Hydraulic Study of Turners Falls Impoundment, Bypass Reach and below Cabot Station

We have no further comments on this study.

3.3.1 Conduct Instream Flow Habitat Assessments in the Bypass Reach and below Cabot Station

Task 1. Consult with Agencies

Table 3.3.1-2 shows that sea lamprey spawning or adopt shallow-fast guild text was added to reach 1. We request that sea lamprey incubation and zone of passage should be added to Reaches 1 & 2.

We note that there is a timing issue in that shad spawning locations will not be known at the time when cross section locations are identified. Upon identifying shad locations, if the nearest existing transects do not adequately represent the depth and velocity of the identified area, we request that additional cross sections be added to the hydraulic model.

Task 9. Study Report

With respect to the use of PHABSIM and the presentation of model results, we recognize the software does not explicitly allow dual-flow analysis from a one-dimensional model results to be presented. Nevertheless, we request that some of the methods described in the PHABSIM user manual be used such that the HABTAE program within PHABSIM is used to generate 2-dimensional charts which are referred to as "plan view plots." We think the inclusion of "plan view plots" in the final report will assist in presenting model results across cells, with distance from the headpin on the x-axis, distance upstream on the y-axis, and the HSI value of each cell depicted by a color indicating the range in which the value falls. Providing these plots across a range of discharges would allow for a crude but adequate assessment of habitat persistence at a site. To limit the amount of output of these graphs, we ask that the applicant consult with us for the species and discharges of interest.

3.3.2 Evaluate Upstream and Downstream Passage of Adult American Shad

Task 2 Study Design and Methods

Monitoring Locations

We request the applicant ensure complete coverage of the Cabot Station tailrace with the location of its receivers. Should a fish decide to migrate up the western extent of the Connecticut River (opposite Cabot Station), we seek assurance that it can be detected.

Previous Task 3: Evaluation of Route Selection and Delay
The applicant has removed this section. As part of the Federal Power Act, we are required to ensure that fish are passed upstream and downstream in a safe, timely and effective manner. As such, we are concerned with how much delay the project causes for a migrating shad.

Task 5 Reporting
We expect that with the data collected from this proposed study, the applicant will be able to report on the following for upstream migration:

- Percent of fish that approach the project, which means that fish are detected above the Deerfield confluence
- Percent of fish that arrive at the "entry zone" to the Cabot fish ladder and the Spillway fish ladder
- Percent of fish that enter either the Cabot ladder or Spillway ladder
- Total time to enter the lift entrance as defined by time the fish entered the project area to when it actually enters the fish lift entrance
- Discharge by all possible routes must be reported such that when a fish is detected at a known location the discharge is also known. These locations include spillway, attraction water system for Spillway ladder intake below gatehouse, Station 1 units, Cabot Station units, Cabot Station bypass, Cabot emergency spill gate.

For the downstream migration, total residence time in the canal should be reported.

We also expect that analysis of the data will include a time to event analysis with time varying covariates. This analysis is relevant for the resource agencies to fully understand how discharge in the bypassed reach affects upstream shad migration. This analysis will be critical when the ultrasound array is deployed as part of study 3.3.19. Prior to the analysis being conducted, we ask that the applicant meet with the resource agencies so that a full understanding of the assumptions being made in the analysis (e.g. the assumed fate of each fish) and the risk set are clearly stated.

Lastly, all receivers should have their clocks synchronized daily. We request that every detection be recorded noting the fish ID, location and time to the second. All data should be made available to the public.

3.3.3 Evaluate Downstream Passage of Juvenile American Shad

Task 2 Evaluate Route of Passage
The RSP states, "Radio telemetry methods will be used to assess routes of downstream passage and occurrences of delay, if possible." We support the applicant's efforts to engage in a downstream study of juveniles and consider this is an important study. However, we also realize the difficulty that tagging juvenile fish presents and recognize that radio telemetry methods on

such small fish might not be feasible. Should this be the case, we ask that the applicant be prepared to rely more heavily on hydro-acoustic data to assess downstream passage. Data from hydro-acoustic equipment can monitor route selection, provide proportional route selection estimates and provide information on timing, namely the time at which a fish passed.

We ask that an additional receiver be placed in the upper reservoir such that if a juvenile shad is entrained in the NMPS intakes, it will be detected and hence accounted for. We also ask for an additional dropper antenna be added to the NMPS intake due to the depth there.

3.3.4 Evaluate Upstream Passage of American Eel at the Turners Falls Project

Task 2. Trap Collections
Traps should be checked at such a frequency to prevent overcrowding or mortality of eels.

3.3.5 Evaluate Downstream Passage of American Eel

Task 1. Evaluate Timing of Downstream Migratory Movements
282 silver eels will be needed for this study (72 for NMPS, 60 for route selection, and 150 for Turbine/dam passage survival studies; pers. comm. Alex Haro, USGS). We recognize that obtaining this many study fish for one year of study presents challenges and the applicant should strive to obtain this sample size for each study year.

What would constitute a "typical snow/weather season" is not defined. We request a second year of study regardless of the runoff conditions in the Connecticut River. Given the number of fish that we think are necessary to have a statistically robust sample size, our understanding of downstream eel migration behavior around the Turner's Falls and NMPS projects will be enhanced significantly with a second year of study.

Task 2b. Turners Falls Route Selection Study
With respect to released fish, we would like to see groups of fish released under spill and no-spill conditions. More specificity describing the release site "approximately 3km upstream of the Turners Falls Dam" would be helpful.

We request additional antennas be added at these areas:

NMPS Intake: Area yagi antenna - – the depth of the intake area (48') precludes detection of radio tags of fish near the bottom with just a yagi antenna where eels are likely to be located. As such, dropper antennas (as proposed for the adult shad study) should be included to assist full depth coverage.

NMPS Upper reservoir: The depth of the intake area (48') precludes detection of radio tags of eels near the bottom. Dropper antennas can detect tags in close proximity but have limited range. At the Muddy Run project droppers were used during the downstream eel trials and no eels were detected on droppers while many were detected by yagi antennas. The unreliability of full detection by droppers indicates that an antenna is necessary in the upper reservoir.

Gatehouse: An antenna at the gatehouse is needed to assess delay and will provide information as to route of passage through the gatehouse (as a backup to the canal antenna) or, by lack of detection, over spill.

Canal: Radio telemetry with multiple droppers is needed at bypass entrance and extending down the sluice to ensure detection of bypassed fish. Based upon the burst frequency, length, slope and drop of the sluice, water velocity and volume of bypass flow, four antennas would be needed with spacing biased toward the start of the sluice. Testing of the detection range may indicate the need to have antennas on both sides of the sluice.

All receivers should be able to detect all frequencies and codes simultaneously. Both FirstLight and TransCanada will be tagging American eels during the fall. Information at FirstLight projects can be augmented by collecting data from fish tagged by TransCanada. Cycling through frequencies and antennas is likely to miss fish with the probability of missed detections increasing with the number of fish tagged. Also, receivers and antennas should be carefully tuned and calibrated in order to ensure complete coverage of routes. We also expect that antenna locations will provide minimal overlap between tag detection zones of each antenna in order to avoid uncertainty about route selection.

Task 2c. Mobile Tracking

At low flows, mobile tracking in a boat 5km downstream of Cabot Station could be difficult. To the extent possible, we would like to see mobile tracking extend 1km downstream of the confluence with the Deerfield River. The mobile tracking efforts will be very important in determining mortality. As such, we think that mobile tracking occur twice per week rather than once per week. Given the length of time these fish will be tracked, we ask that a tag with a life of at least 90 days be used, such as Sigma Eight tags with an 80 mAH battery.

Task 3. Data Management and Analysis

The RSP states the following: "That data will be reduced by applying an intensity threshold that is representative of the target size and analyzed with α, β-tracking algorithm which identifies the series of echoes that were returned by an individual fish over successive pings." Nevertheless, we think this method does not provide complete assurance that acoustic targets can be definitively identified as eels as opposed to other fish with similar target strength, except via concurrent bypass sampling. We would like to see additional information that provides assurance that target eels can confidently be identified as eels.

Task 5: Reporting

The report should include:

- Release numbers, locations and dates
- Fish vitals (length, weight, and morphometric criteria)
- River temperature (collected every hour) at Northfield, canal, bypass and below Cabot Station
- Route selection
- Analysis of how project operations affect downstream movement and route selection
- All detections of fish

- Behavior of fish that do not pass the project
- Delay of fish: location and time
- Survival of fish passing each project facility
- A daily record of Northfield operations during the study period

A long term history of pumping (number of units per hour) by month for April through November should be provided in tabular form similar to Tables 2.3-1 and 2.3-2 in the Exelon Muddy Run RSP 3.3 for eels or shad (FERC # 2355).

3.3.6 Impact of Project Operations on Shad Spawning, Spawning Habitat and Egg Deposition in the Area of the Northfield Mountain and turners Falls Projects

We have no further comments on this study.

3.3.7 Fish Entrainment and Turbine Passage Mortality Study

We have no further comments on this study.

3.3.8 Computational Fluid Dynamics Modeling in the Vicinity of the Fishway Entrances and Powerhouse Forebays

We have no further comments on this 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

Task 5 Conduct and Analyze Transient Production Runs

This section makes reference to mainstem river flows based on the 25% and 75% exceedance flow at Turners Falls dam. We suggest that a fuller range of flows be assessed, namely the 5%, 25%, 50%, 75% and 95% exceedance flows.

3.3.11 Fish Assemblage Assessment

We have no further comments on this study.

3.3.12 Evaluate Frequency and Impact of Emergency Water Control Gate Discharge Events and Bypass Flume Events on Shortnose Sturgeon Spawning and rearing Habitat in the Tailrace and Downstream from Cabot Station

We have no further comments on this study.

3.3.15 Assessment of Adult Sea Lamprey Spawning with the Turners Falls Project and Northfield Mountain Project Area

Study Goals and Objectives

In our PAD comment and study request letter, the first objectives we stated for this study included determining whether the Turners Falls and NMPS operations are affecting the success of sea lamprey spawning with the project area.

Task 1. Field Data Collection

We know that not all upstream migrating sea lamprey successfully pass Holyoke; consequently we anticipate this to be the case at Turners Falls. As such, we request that tagging of sea lamprey occur below the Turners Falls project to determine if sea lamprey spawning grounds exists downstream of Turners Falls dam, but within the Project boundary.

Given that 20 fish will be tagged upstream of the route 116 bridge and another 20 will be tagged upstream of the Turners Falls gatehouse, plus our requested additional fish below the Turners Falls dam, manual tracking will be needed to track the fish and locate identified spawning redds. Telemetry locations used for the shad studies likely will not provide sufficient coverage to locate all possible redd locations.

It is not clear in the RSP how many redds could be located as the lamprey are tracked. We would like as many redds as possible to be identified between the Turners Fall dam and the Route 116 bridge in order to conduct a full assessment of project operations on redds.

In addition to capping redds, redds in several zones of impact (closer to and farther away from Cabot station) should be evaluated for the presence of eggs. This can be done in a minimally invasive way by capturing eggs in a net below a redd while moving rocks in the redd until a few eggs are captured. If no eggs are located the redd is not viable. We also have some concerns that the nets used to cap redds may get filled with sediment and subsequent analysis may prove quite difficult.

During alterations in flow (up and down) caused by project operations, observations of redds with lamprey should be made to determine if redd abandonment occurs as a result of project operations. Redd abandonment is a probable effect of project operations.

Task 2. Data analysis

The definition of success in this plan is limited to the presence or absence of larvae in redds which are capped. Spawning success cannot be documented merely by the presence of redds or of the condition of redds prior to and after peaking events. Rather, it should be documented with an evaluation of eggs in redds.

Redds in areas that are highly impacted by peaking flows should be compared to redds in low impact areas to determine if eggs are present. Similar or a significant difference in the frequency of redds with eggs in the high and low impact areas would be an indicator of spawning success. Similarly, the number of incidence of redd abandonment can be compared between high and low impact areas.

Task 3: Report

The report should also include:

- Locations of all telemetry detections
- Discharge and stage during all observations of redds during fluctuations
- Continuous river temperature
- A statistical analysis of before and after events
- Maps of all suitable spawning locations
- Maps of all redds located during the study

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

We request that dissolved oxygen and water temperature data be collected in standing pools during the drawdown period.

A task for Reporting is not included. A report should be completed. It should include but not be limited to:

- Temperature, DO and turbidity data from all samples
- Map and area of habitats within each zone
- Map and area of all pools during each of the three monitoring periods
- Map of quadrate locations
- Description of survey methods during the initial evaluation
- List and number of fish species stranded
- Results of electrofishing and seining.
- Counts of mussels and ammocoetes in each quadrate
- Expansion of sub-sample quadrates to total mussels and ammocoetes in each zone
- Summary of Task 2 consultation
- Plans for mitigation that will be tested in 2015

Document Content(s)

P-1889 and P-2485 Revised PSP Comment Letter .PDF.....1-9