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July 15, 2013

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject: Turners Falls Hydroelectric Project, FERC Project No. 1889
Northfield Mountain Pumped Storage Project, FERC Project No. 2485
Comments on Proposed Study Plan**

Dear Secretary Bose:

Pursuant to the Federal Energy Regulatory Commission's (Commission or FERC) regulations 18 C.F.R. § 5.12, The Nature Conservancy (TNC) is providing comment on FirstLight Hydro Generating Company's (FirstLight) Proposed Study Plan (PSP) for the relicensing of the Turners Falls Hydroelectric Project (FERC No. 1889) and the Northfield Mountain Pumped Storage Project (FERC No. 2485), filed on April 15, 2013, and the Updated Proposed Study Plan, filed by FirstLight on June 28, 2013. Unless specifically noted, all comments in this letter are in reference to the June 28, 2013 Updated PSP.

Between May 14, 2013 and June 14, 2013, representatives of TNC's Connecticut River Program attended several meetings held by FirstLight to discuss the content and further development of the PSP. Overall, we find that the concerns and comments that we raised at these meetings were addressed in the Updated PSP. The comments provided below include some brief requests for clarification and further refinement, as well as a few substantial comments with regard to some of the more extensive changes that were made in the Updated PSP. Our comments are based on a review of the April 15, 2013 original PSP, the June 28, 2013 Updated PSP, and discussions that took place at meetings held between May 14 and June 14 2013.

The comments that follow are organized by the numbering and study titles given in the June 28, 2013 Updated PSP.

3.2 Water Resources

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

Methodology (18 CFR § 5.11(b)(1), (d)(5)-(6))

Task 8: Report

On page 3-58, FirstLight presents the proposed content of the report for the hydraulic study. We request that the following specific components be included in the report or provided upon request:

- The HEC-RAS files necessary to run the models and reproduce the results, including the geometry files, plan files, flow files, and project files (i.e., file extensions .f, .g, .O, .p, .prj, and .r);
- The associated GIS files with topographic data for the valley and stream cross sections; and
- A brief summary of the approach taken to calibrate the model including the data used and assumptions made.

3.3 Fish and Aquatic Resources

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

Methodology (18 CFR § 5.11(b)(1), (d)(5)-(6))

Task 1: Consult with Agencies and Interested Stakeholders to Determine Study Area, Study Reaches, and Habitat Suitability Index Curves

Freshwater mussels

Overall, we find that FirstLight has made efforts to accommodate the interests of TNC and of the agencies and other participants with regard to freshwater mussel habitat. In the June 28 Updated PSP, substantial content has been added to address these interests. However, we are requesting that a few additional points of clarity be added.

The footnote on page 3-72 states: “FirstLight proposes to adapt empirical data collected within Reach 4 during mussel survey work...to develop HSI criteria specific to yellow lampmussel if this species is found there in sufficient abundance. These criteria can then be applied retroactively...” High caution should be observed if using habitat data from a regulated river

system, unless there is documentation of a successfully reproducing and persistent population. Count data (relative abundance) alone may not be adequate for this determination, but the presence of multiple sizes or age classes could potentially indicate continued successful reproduction over many years. Conversely, lack of adequate representation among age classes could indicate lack of successful reproduction, and thus potentially insufficient habitat availability. Therefore, we suggest that “sufficient age or size structure” be used in addition to “sufficient abundance” as a qualifier to using collected empirical data for development of habitat suitability criteria.

The presence of host fish also does not necessarily indicate a successfully reproducing or persistent population. Whereas it represents an important part of a mussel’s life history requirements and should be included, host fish should not be used as a surrogate if habitat suitability is intended to reflect the habitat necessary for a species to reproduce and persist. If used alone, it should be indicated that it does not fully represent freshwater mussel habitat suitability. However, it is possible that multiple habitat requirements for mussels may be included within one or more habitat guilds, if guilds are included among the habitat criteria that are evaluated.

Task 4: Habitat Modeling (Reaches 1-4)

In previous comments to FirstLight, we recommended the inclusion of spatial maps that depict weighted usable area (WUA) across cells and over a range of flow values (Figure A) for all sites for which 1D analysis is conducted. We recognize the excessiveness of doing this for all habitat criteria of all life history stages and species being evaluated in this study. However, there is still high value in understanding how spatial habitat patterns change over a range of flow. As a compromise, we suggest the inclusion of these spatial maps at least for the habitat guild criteria (i.e., shallow-fast, shallow-slow, deep-fast habitats). This would give a basic understanding of the dynamic spatial patterns of habitat in the study area without excessive effort.

Study Schedule (18 CFR § 5.11(b)(2) and (c))

The Commission should note that the site visits scheduled for July 2013 were postponed, to be rescheduled for a later date in August or September.

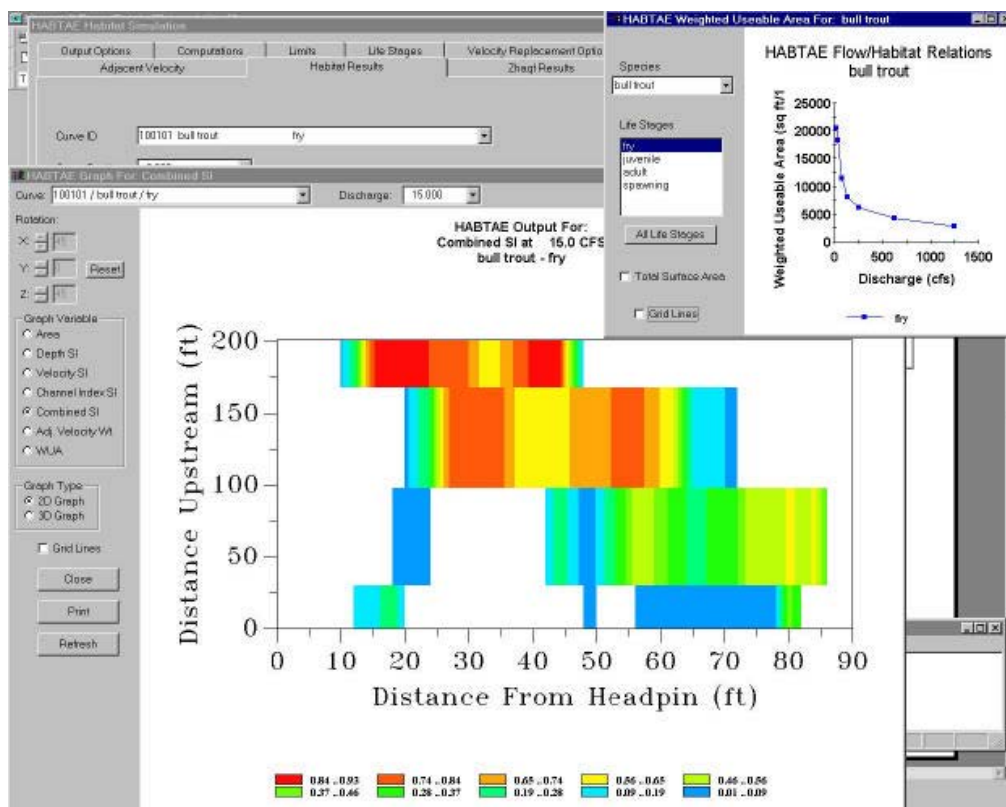


Figure A: Example of a spatial map that may be created using PHABSIM (from Milhous and Waddle 2012).

3.3.11 Fish Assemblage Assessment

General Description of Proposed Study

In the last sentence of the second paragraph of the general study description, FirstLight states, “The proposed study will include a statistically rigorous and comprehensive stratified-random design similar to what has been used successfully on large rivers [with] a high degree of spatial heterogeneity.” Whereas they cited Kiraly (2012) in the original April 15, 2013 PSP, in the June 28, 2013 updated PSP, they removed this citation, but failed to justify how their proposed study design still represents a “statistically rigorous and comprehensive stratified-random design... used successfully on large rivers...” No mention of a stratified-random design occurs again in the rest of the document; the only additional mention of random sampling is on p. 3-181, where it states that additional sites will be randomly selected, but without any additional detail. We strongly support the use of a “statistically rigorous and comprehensive stratified-random design,” as it removes bias from the collected data, allows for clear interpretation of results, and provides the best information for making decisions. However, FirstLight needs to clearly indicate how their study design meets this level of quality.

Existing Information and Need for Additional Information (18 CFR § 5.11(d)(3))

In the last paragraph of this section (p. 3-180), FirstLight provides a justification for the minimum number of fish ($n = 150$) that will be collected in each sampled reach. As stated in the PSP, "...a minimum of 150 fish per reach would ensure that most species within a reach were captured..." It should be noted that this justification applies to the level of effort needed to measure species richness (the number of species collected), but does not speak to the level of effort needed to estimate species abundance (the number of individuals collected).

Methodology (18 CFR § 5.11(b)(1), (d)(5)-(6))

In the first paragraph of the study methodology on page 3-180, FirstLight indicates that the geographic scope of the study could change based on potential impact to shortnose sturgeon. We recommend that before changing the geographic scope, alternative sampling gears that do not impact shortnose sturgeon should be considered for use in areas of concern. Changing the geographic scope of the study would substantially diminish the value of the study, and limit the ability to evaluate the full scope of project effects.

The information provided describing site, station, and sample selection is vague, and needs additional clarity, as sampling design is critical to drawing meaningful conclusions from study results. Improper sample selection and replication can lead to an inability to use the collected data. In the general study description, FirstLight mentions that the study design is "stratified-random," but fails to make this clear in the methodology. We strongly support such a study design, as it promotes robust data and clear interpretation of results. However, the claims of such a study design need to be clearly supported.

On p. 3-180, the PSP states: "The study area will be divided into stations based on habitat type; multiple methods of fish capture will be used in each station." These methods are unclear, and the following questions should be addressed:

- What are the habitat types?
- What is the spatial extent of each station?
- Will the stations be continuous or non-continuous within the study area?
- If non-continuous, how will they be selected?
- How many samples will be collected with each gear type?
- How will these sample locations be selected in each station?
- Will all gear types be used in each station?

Task 1: Sampling Location Selection

On p. 3-181, the text states, “Prior to field sampling, stations to be sampled will be selected to ensure all habitat types are adequately represented. Alternative sampling locations will also be identified by habitat in case a sampling station is inaccessible.” Again, it is not clear how stations or alternative sampling locations will be selected, or at what the spatial scale the station/location sampling will occur.

As presented, the study design does not support a “statistically rigorous and comprehensive stratified-random design.” However, we strongly support the use of such a study design, and encourage its development. We support the use of FirstLight’s aquatic mesohabitat assessment (FirstLight 2012) to define the habitat types. For a robust, stratified-random design, we suggest that the stations be chosen randomly and proportionally by habitat type. Ideally, this should be done separately for each gear type, so that there are an equivalent number of boat electrofishing, seine, and gill net samples, each selected randomly and independently, and there should be at least three randomly-selected samples of each gear type at each station. This prevents anomalous samples, allows for site-level statistical evaluation, and is standard scientific field design (Eberhardt and Thomas 1991, Krebs 1998). Alternately, and depending on the scale of the samples and stations, different gear types could be considered independent replicates. In this case, each gear type would need to be employed at each randomly-selected station.

Because the development of field study design is critical to the ability to use study results, we strongly recommend the inclusion of agency and other stakeholder representatives in the development of the field design for this study.

Task 2: Fish Capture

In discussions over the Fish Assemblage Study (Study 10) of the PSP for TransCanada’s Wilder, Bellows Falls, and Vernon hydropower facilities, there was concern regarding the potential extent of mortality associated with 24-hour gill net sets. In the TransCanada study, these have been limited to 2-hour sets to reduce mortality. We suggest that similar methods be employed in this study.

In fisheries management, relative abundance is typically measured as the number of individuals collected (or catch) per unit effort (CPUE), as it is here, and is assumed to be directly proportional to the total population size (Ney 1999). Gear biases (the tendency of gear to select for some species more than others) substantially violate this assumption, which is why inclusion of multiple gear types is important (if a study objective is to document species abundance, as it is for this study). In their described study methodology, FirstLight has ensured that they will

include multiple gear types in their study design, but their methods suggest that alternate gear types will only be used in locations where boat electrofishing is not effective. Whereas this is a valid reason, it is important that different gear types are not simply included as a last resort, but are an integral part of the study design in order to reduce bias of relative abundance estimates. The recommendations presented for study design under “Task 1” could address these limitations and biases.

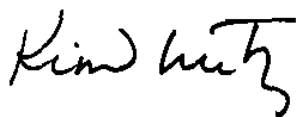
Task 3: Data Analysis and Reporting

FirstLight proposes to calculate catch per unit effort (CPUE) for each species, station, and sampling technique. In general, if CPUE is calculated separately across species, stations, or sampling techniques, the premise is that values of different species, stations, or sampling techniques could be compared. In order for this to be true, stations or samples within stations must be sampled randomly, and sampling techniques must either also be employed randomly or must be included at each station (depending on the scale of the stations/samples). Otherwise, it is not possible to compare samples and draw any inference concerning differences or similarities among them (Eberhardt and Thomas 1991, Krebs 1998). As mentioned in the general description, it is possible that FirstLight intends for the study design to follow a stratified-random study design, but if so, at present this is unclear.

We also ask that FirstLight make the raw data available in digital format so that agency representatives and other interested parties may conduct additional analyses beyond what is done within the scope of this study.

Thank you for this opportunity to provide comment on FirstLight’s Proposed Study Plan. If you have any questions regarding the preceding comments, please contact Katie Kennedy at the Nature Conservancy’s Connecticut River Program office (413-586-2349 or kkennedy@tnc.org).

Sincerely,



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Document Content(s)

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