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VIA ELECTRONIC FILING

June 28, 2018

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N. E., Room 1A
Washington, DC 20426

Re: FirstLight Hydro Generating Company, Turners Falls Hydroelectric Project (FERC No. 1889) and Northfield Mountain Pumped Storage Project (FERC No. 2485). Response to Filing: Connecticut River Juvenile American Shad Assessment Report (relevant to FERC main stem relicensing (FERC #s – 1855, 1904, 2485, 1889 proceedings)

Dear Secretary Bose:

On May 8, 2017, the US Fish and Wildlife Service's (USFWS) Connecticut River Fish and Wildlife Conservation Office filed a letter with the Federal Energy Regulatory Commission (FERC) requesting that an attached report titled Juvenile American Shad Assessment in the Connecticut River – Fall 2017 be included into the administrative records for the Turners Falls Project, FERC No. 1889, the Vernon Project, FERC No. 1904, the Bellows Falls Project, FERC No. 1855, and the Northfield Mountain Pumped Storage Project, FERC No. 2485.

The study report includes commentary on prior relicensing studies filed with FERC including sampling methods and data analysis. In the Discussion Section, the report indicates that the 2016 Northfield Mountain ichthyoplankton study results and expansion estimates for losses did not utilize the Crecco et al. (1983) daily survival rate for the juvenile life stage of shad despite the study's use of Crecco rates for the four preceding larval life stages. The report goes on to state that this was not explained although the USFWS May 2017 letter to FERC on this study report pointed out this issue. However, in the May 30, 2017 response to stakeholder comments filing with FERC, FirstLight did respond to this question. Here is the complete reply:

The approved study plan for Study 3.3.20 indicated that survival fraction data for all life stages of American shad entrained will be compiled from EPA (2004). For the second year of study, stakeholders requested that river specific survival fractions from Crecco et al (1983) be used for calculating egg and larval survival. As requested, these were used for the egg and larval stages. Current comments request the in-river juvenile stage now be split out from the estuarine- marine juvenile life stage. The stakeholders requested that a 98% daily survival for in-river juvenile shad for 70 days based on Crecco et al. (1983) be used.

FirstLight used the egg and larval mortality rates from Crecco et al. (1983) as requested but used the EPA (2004) mortality estimates for the juvenile stage as we believe this is a more accurate estimate of juvenile mortality. The same authors, Vic Crecco and Tom Savoy, Connecticut Department of Energy and Environmental Protection, revisited their juvenile shad mortality estimate in a published paper, Savoy and Crecco (2004). They indicated that a dramatic and unexpected decline in American Shad abundance occurred in the Connecticut River since 1992. They attributed this decline to increased predation in the Connecticut River from 1992 to 2002. They concluded that future stock assessments consider time varying natural mortality rates brought about by shifts in predation.

Stakeholders requested juvenile equivalent estimates for the period of freshwater residency should be separated out because a peer-reviewed, river-specific rate exists in Crecco et al. 1983. However, since the authors of this estimate have revisited the mortality rates and concluded that it has shifted over time, we believe that using the more recently published EPA (2004) mortality rates is a better estimate of juvenile mortality. This is a regional estimate of mortality that includes both in-river and estuarine marine juvenile life stages. Using this estimate with a larger sample size should better account for annual variations in mortality and provides a standard metric for comparing losses among species, years, and regions.

In addition, FirstLight wishes to comment on the methods and conclusions in the Connecticut River Juvenile American Shad Assessment Report. First, flaws exist with the data collection and analysis associated with study Objective 2 *Calculate juvenile shad length-weight relationships as a proxy for condition and compare among inter-dam segments*. The report indicates that netted juvenile shad were immediately placed on ice and either frozen for later processing or processed the following day. At the end of sampling, frozen shad were thawed and total length (mm) and weight (g) were recorded. Freezing fish for later processing significantly changes both length and weight measurements (Engel 1974 and Sayers 1987). If all the collected juvenile shad had been frozen this change would have been relative; however, some were iced and some were frozen so these measurements are invalid and should not be used for comparisons. In addition, the authors should have performed an analysis of covariance (ANCOVA) to determine if the length-weight relationship regression lines are significantly different between impoundments. An ANCOVA should be used to test for differences in regression parameters for logged length-weight relationships between geographic locales, especially where spatial or temporal effects might influence interpretations regarding population wellness as modeled by weight (Pope and Kruse 2007). Failure to perform an ANCOVA may lead to an inaccurate conclusion, where slopes are interpreted as different when in fact they are not.

Second, the report states on page 10, "*The date when 50% of the 2017 adult run counts were observed at Holyoke, Turners, and Vernon were approximately 5/21, 5/27 and 6/3 respectively, indicating upstream delays in spawn timing.*" In 2015, the median travel time for radio tagged fish released at Holyoke to swim upstream to the Cabot Tailrace area was 6.35 days and 5.3 days for PIT tagged only fish. Sullivan (2004) reported for four years of studies an annual median transit times for migrating shad from Holyoke to Turners Falls ranged from 4 to 7.1 days. If 50% of the shad passed Holyoke on 5/21 and 50% of the shad passed Cabot by 5/27, there is no delay if 50% of the shad haven't even reached the project yet. These statistics indicate no accumulated time. For example, if the median travel time was only 2 days, we could conclude delay. However, since the time for a shad to travel from Holyoke to Turners Falls is 5.3 to 6.3 days delay cannot be inferred by these data. On page 11 of the report the authors state, "*Shad spawning success is believed to be further influenced by environmental and operational conditions (e.g. rapid water level fluctuations and hydropower peaking operations)*." However, the report failed to present any supporting studies or corroborating data to support this belief.

If you have any questions, or need additional information, please feel free to contact me.

Sincerely,

Douglas Bennett

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