



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

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In Reply Refer To:  
FWS/Region5/ES/MEFO

March 10, 2008

Kevin Bernier, Environmental Specialist  
Brookfield Power  
51 Simpson Avenue  
Winslow, Maine 04901

**SUBMITTED ELECTRONICALLY**

RE: Hydro-Kennebec Project (FERC No. 2611)  
Comments on 2007 Interim Downstream Fish Passage Report and 2008 Study  
Plan

Dear Mr. Bernier:

The U.S. Fish and Wildlife Service (Service) has reviewed the January 31, 2008 draft report on the results from the images that were collected with camera systems during 2007 to assess the effectiveness of the downstream fish passage and the proposed studies planned for 2008 at the Hydro-Kennebec Project (FERC No. 2611). The interim downstream fish passage facility is required to protect adult and juvenile fish that may be migrating downstream as a result of fish being passed upstream and other management activities since the completion of the fish lift at the Lockwood Project in 2006. We appreciate the opportunity to comment on both of these items.

Your cover letter indicates that you plan to operate the downstream fish passage facility from April through October in 2008. This timing was based on the 2007 results that observed no fish using the bypass in November and December. The operation of the bypass during this period is needed to provide safe and effective passage for adult Atlantic salmon that may be migrating downstream after spawning. In 2007, fifteen salmon were trapped in the Lockwood Project and released upstream of the Hydro-Kennebec Project. These low numbers may have not been detected by your study, given its qualitative design. Mortality to American eel was also documented in November 2007 at the Shawmut Project, which is upstream of the Hydro-Kennebec Project. Consequently, we continue to support operating the downstream bypass facility through December.

In reviewing the draft report, we examined our notes from our June 7, 2007 inspection of the interim downstream fish passage facility. We met you and Eric Lindell and had the opportunity to observe the facility in operation (consisting of floating angled fish guidance device in forebay, surface bypass at spillway side of powerhouse intake, turbines at 100 percent and a head pond that was about 12 includes above the normal elevation of 81 feet). We discussed several items during the inspection, including:

1. The top of the fish guidance device was submerged 12 to 18 inches below the surface of the water, making the guidance less effective for salmon smolts. We indicated that it was necessary to operate the project in such a way as to eliminate the submergence of floating guidance device;
2. The cascade from the surface bypass gate impacted the vertical and side walls in the bypass channel in a manner that could possibly injure fish that are guided into the bypass gate. We estimate the flow to be about 360 cfs (the normal bypass flow is 320 cfs but the higher headpond would result in more bypass flow). Given this condition, we recommended a mark-and-recapture study at the normal operating flow of 320 cfs to assess if safe and effective downstream fish passage is being achieved; and
3. We noted the need to install the previously recommend confining sill on the roof of draft tube extension in the tailrace. The sill is needed to keep the discharge jet from the bypass channel from spreading onto exposed draft tube roof.

We were very pleased with your response to the submerged fish guidance device, which was corrected within days of the inspection. We also appreciate your effort to complete the confining sill last year. The draft report or this year's study plan does not appear to address the mark-and-recapture study to assess fish injury. The Service believes that this study is still necessary because of the turbulent conditions in the bypass channel.

### **General Comments**

The draft report indicates that the fish guidance device was not installed last year until May 29<sup>th</sup> because of high flow conditions. Salmon smolts migrate downstream from April through May so the late installation of the guidance device leaves smolts more susceptible to turbine entrainment. Modifications need to be considered to either the process to install the guidance device, the device itself, or project operations to allow its installation and effective operation starting in April.

The conclusions drawn in the report supported using a handful of representative images. A more systematic analysis needs to be completed with the collected data to better support the conclusions that were drawn about how the fish may or may not use the bypass. We recommend that the images are coded based on camera location, fish behavior, observational conditions (image quality), river flow and bypass flow and then are presented based on the frequency and percent occurrence on a daily basis. It would be important to include the times when sampling did not occur due to operational issues (turbulence, malfunction and debris). This approach

would still be qualitative but it would be more structured, providing better support for your conclusions.

The draft report has several references indicating that dead or injured fish were not observed during the study or in previous visual observations. The qualitative methods used would make it difficult to detect dead or injured fish with much certainty. We are not comfortable in concluding that injury does not occur in the facility based on anecdotal observation because of how the water impacts the vertical and side walls in the bypass channel as it leaves the bypass gate.

It would be helpful if you include a more detail description of your operational experience with the fish guidance device in 2007, including the type of damage that occurred, the repairs that were needed, the incidence that it was overtopped, and the conditions when overtopping occurred.

The images should be labeled so one can identify the fish guidance device or the bypass gate in the images.

### **Specific Comments**

The draft report did not have page numbers so we numbered the pages as a reference.

Page 2, 1<sup>st</sup> Paragraph. Two cameras were installed to monitor the bypass weir from April 10 to December 31<sup>st</sup>. A table should be included that includes the date, the river flow, bypass flow, generation flow and the incidence of fish (species, if possible, and size) shown either holding or entering the bypass facility.

Page 6, 5<sup>th</sup> Paragraph. Document how many of the sampled images were obstructed by turbulence, debris or other factors.

Page 7, Image PI-4. This image shows the cascade from the surface bypass gate impacting the vertical and side walls in the bypass channel, as discussed above.

Page 11, 1<sup>st</sup> Paragraph. The Didson camera observations should be presented in a table that includes the date, the river flow, bypass flow, generation flow, and the incidence of fish (species, if possible, and size) shown either holding, using the bypass facility, between the fish guidance device and the trash rack, and fish at the face of the trash rack (those likely entrained).

Page 21, 1<sup>st</sup> Paragraph. Turbulence from the floating boom on the fish guidance device appeared to create a barrier to fish by preventing them from moving into the bypass gate. We recommend that the report provide more interpretation of this observation so that we can better understand the frequency and flow conditions when this delay may occur.

Page 26, 3<sup>rd</sup> Paragraph. As discussed above, the downstream fish passage facility should be operated through December.

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Page 26, 4<sup>th</sup> Paragraph. The report indicates that lighting and flow acceleration will be studied in 2008 to improve guiding fish to the bypass gate, but not information is provided on the methods that will be used for the study.

Page 27, 3<sup>rd</sup> Paragraph. No details are provided on how the images will be analyzed and presented in 2008.

Page 27, 5<sup>th</sup> Paragraph. The proposed number of antennas and their placement should be able to detect the number of smolts that enter the bypass gate, but they will not provide any information on the other pathways smolts use (spillway, turbine entrainment or remain in the impoundment). At a minimum, the placement of the antennas should be reconsidered to provide information about the smolts that may become entrained.

Page 27, 8<sup>th</sup> Paragraph. It is unclear whether the control group will be tagged or not. We recommend that they are tagged in the same manner as the experimental group. The number of fish in the control group should be similar to that of the experimental group or at least over 100 fish. The smolts are expected to be released after the fish guidance device is deployed. It will be important to start the test no later than May 20<sup>th</sup> to ensure that the test is completed within the expected smolt downstream migration period, otherwise smolt migratory urge may become diminished leading to an increased residualization risk.

We appreciate the opportunity to comment on the draft report and 2008 study plan. We found the 2007 field inspection to be very valuable and also plan to visit the facility this spring to observe its operation. If you have any questions regarding these comments, please contact Frederic Seavey at (207) 827-5938 extension 16 or at the above address.

Sincerely,

*/s/ Frederic G. Seavey*

Frederic G. Seavey  
Fish and Wildlife Biologist

cc: S. McDermott, NOAA-Fisheries  
D. Murch, MDEP  
G. Wippelhauser and N. Dube, MDMR  
S. Timpano, MDIFW  
Reading File

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