



United States Department of the Interior

FISH AND WILDLIFE SERVICE



300 Westgate Center Drive
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May 2, 2013

MEMORANDUM

To: Supervisor, Chesapeake Bay Field Office, Annapolis, MD
Attention: David Sutherland, Fish and Wildlife Biologist

Susquehanna River Coordinator, Maryland Fishery Resources Office, Annapolis, MD
Attention: Sheila Eyler, Fish and Wildlife Biologist

From: Jesus Morales, Hydraulic Engineer, Fish Passage Engineering

Subject: Assessment of West Fish Lift at Conowingo Hydroelectric Project (FERC #405) on May 2, 2013 in support of re-licensing activities

As requested by your offices and in support of re-licensing activities, an assessment of the fish passage facilities at the Conowingo Hydroelectric Project (Project) was performed at 10:00 am on Thursday, 05/02/2013. The Project is owned and operated by the Exelon Corporation. The Service's review team was led by David Sutherland. The tour was led by licensee's representative and General Manager, Ken Poletti. Consultants from Gomez and Sullivan Engineers, PC, and Normandieu Associates, Inc., and personnel from the Maryland Department of Natural Resources and their consultants from Environmental Resources Management were also present. This memorandum summarizes an engineering assessment of the west fish lift (WFL). It does not represent, in whole, the Service's engineering recommendations for fish passage at the Project.

Upstream passage facilities include an east and west fish lift. The WFL is a trap and transport facility located at the west side of the Conowingo tailrace that uses the house turbine units for fish attraction flow to the lift. The WFL was constructed in 1972 as an experimental facility to determine the feasibility of the fish lift technology and has been a valuable tool in past restoration efforts on the river. Both lifts were operating at the time of this inspection (the licensee's representatives indicated that the American shad upstream migration period typically runs from March 1 to May 30).

Based on this assessment, the WFL appears to maintain insufficient volume of water inside the hopper, presents a high risk for injury during transfer from the hopper into the holding tank, and creates hydraulic conditions inside the fishway that do not meet USFWS criteria:

1. Insufficient water inside the hopper. As soon as the hopper starts lifting, water spills out of the bucket, leaving the bucket with less than the USFWS criteria of 0.1 cubic feet per pound of fish. During a lift we were able to observe the fish lying on top of each other while being lifted. The

Appendix section shows a picture of a lift in progress, and the lack of water for the top layer of fish being lifted.

2. Risk for injury. Because of the way the fish are being transferred from the bucket into the holding tank, Fish Passage Engineering is concern about potential injuries caused by the rusty square-shaped gate at the bottom of the bucket. A completely new hopper with safer and fish-friendly features is recommended.
3. Entrance channel hydraulics. Based on visual evidence, water velocities in the area over the hopper and at the holding pool look to be lower than the required velocities by USFWS criteria (1 to 3 fps). Also, false attraction flow at the 90-degrees turn upstream from the entrance gate is delaying the fish that enter the fishway by having them face the wrong direction for long periods of time.

Additional observations made during this site visit:

- WFL is a prototype trap & truck facility and is well beyond its design life
- Dissolved oxygen level in house unit discharge should be investigated if it will continue to serve as attraction water for the WFL
- WFL capacity is currently limited by physical space (for trap & truck operations); a complete lift to the head pond appears to be necessary to increase WFL capacity
- Unit 2 provides complimentary attraction to WFL; this should be formalized in a standard operating procedure

Thank you for the opportunity to participate in this review. We look forward to supporting your efforts to restore the Susquehanna River ecosystem. For questions please contact Jesus at 413-253-8206.

cc: Brett Towler, USFWS

Appendix



West Fish Lift bucket during a lift on 05/02/13. This image shows the fish being lifted by the current hopper, and very little water available for them during the lift. The lift lasts around 4 minutes, during which the fish lie on top of each other. The exit sluice out this hopper is the bottom gate that opens and discharges the fish into an almost empty holding tank. See video of it captured on the same day of the site visit.