

MEMORANDUM FOR THE RECORD 18-IH-01

SUBJECT: Eleven juvenile Chinook salmon mortalities during unwatering of the Ice Harbor Dam upper south fish ladder, for annual inspection and maintenance.

- A. Species – *Oncorhynchus tshawytscha*.
- B. Origin – Unknown. Most or all were unclipped.
- C. Length – Approximately 5-7”
- D. Marks and tags – None observed.
- E. Marks and injuries found on carcass – None seen.
- F. Location – Inside the south fish ladder, where the ladder comes down to tailwater level.

- G. Cause and time of death – On January 3, during the unwatering process, approximately 6” of water from the upper diffuser and from leakage through the ladder exit bulkhead was flowing through the ladder weir salmon orifices to help flush fish to the lower ladder. Before personnel go down the ladder to direct straggling fish to tailwater, the upper diffuser is typically closed additionally to about 4” of water flowing through the orifices so personnel are not submerged when laying on the creepers. As water level subsided, there ended up being about 2.5” to 3” of water going through the salmon orifices, as noted when personnel reached the count station, so the upper diffuser flow was increased slightly. For safety reasons, the upper diffuser can only be opened in very small increments to make sure personnel in the ladder are not put at risk. Due to the lag time for the extra water to come down the ladder, some of the straggling fish were partially exposed out of the water downstream of the fish count station as they were directed to tailwater. No weakly swimming fish were observed in the ladder at tailwater level at the end of the fish evacuation process, but at 1000 hours on January 4, 11 dead juvenile Chinook were observed in the water at that location from the roadway deck overlooking the lower ladder. These fish are presumed to have died from the stress of being partially exposed during the unwatering procedure.

- H. Future and preventative measures – During the unwatering of the upper fish ladder, the fishery biologist slowly turned down the upper diffuser, to get the 6” of water, then the 4” of water through orifices before personnel entered the fish ladder. The biologist then moved to the roadway deck overlooking the ladder at tailwater level, and was in radio communication with a mechanic stationed at the upper diffuser valve. At the conclusion of the fish recovery operation, the biologist observed there was approximately 2.5” to 3” of water at the upper diffuser, going through the orifices. Either the water level had not stabilized at 4” at the upper diffuser when the biologist left the station, and/or the upper

diffuser was further turned down after the biologist left. The low water problem may not have happened if all personnel involved waited longer for the water level to stabilize, before entering the ladder for fish evacuation. The biologist is investigating and assessing the situation, to determine if the details of the unwatering procedure need to be modified.

I. Pictures included – none.

Ken Fone
Project Fishery Biologist
Ice Harbor Dam
509-543-3208
kenneth.r.fone@usace.army.mil