



Oregon

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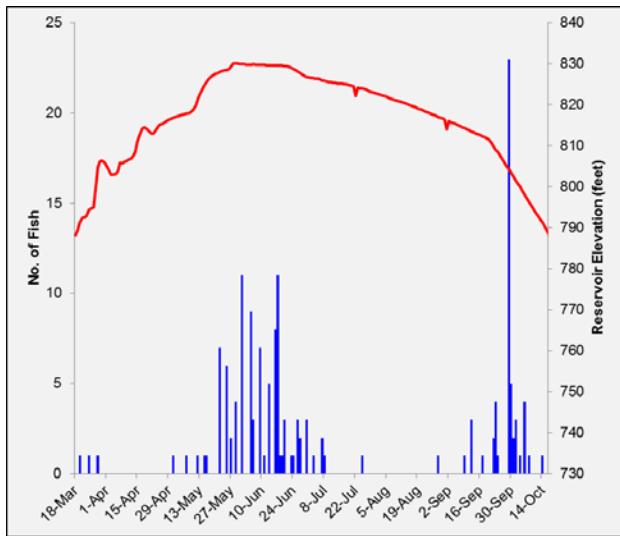
Mr. Walker and Ms. Mackey,

Thank you for the opportunity to comment on the Memo of Coordination '16FAL01 Regulating Outlet Repairs'. The drawdown and delayed refill of Fall Creek Reservoir offers an opportunity to gather additional information on fish behavior and potential impacts (positive and negative) to outmigrating fish from Fall Creek.

Fall Creek Dam is currently operated to facilitate fish passage through a deep drawdown through the regulating outlet during the winter. The regulating outlet is the only outlet in the dam other than the fish horns that feed the fish facility. The fish horns have been demonstrated to be ineffective at passing fish, and those that do become entrained generally do not survive. The regulating outlet is closed during the months of March to October, and the only flow out of the dam is through the fish horns. Fish that are confined to the reservoir between March and October have shown high growth rates, and are typically larger than similar-aged fish in other basins when they outmigrate during the reservoir drawdown.

While the winter drawdown operation has been demonstrated to successfully pass fish out of the reservoir during the drawdown, little is known about juvenile fish mortality in the reservoir, nor impacts of confining fish in the reservoir with no viable outlet during the months of mid-March to mid-October. For example, Chinook rearing in Fall Creek Reservoir have been shown to have higher parasitic copepod infection levels than Chinook in other reservoirs. Additionally, the large size of juveniles may result in younger age of adults returning, with subsequent lower fecundity.

A study of entrainment in the fish horns was conducted in 2013 and 2014. The study showed that most wild juvenile Chinook attempting to exit the dam occurred during May and June, and then peaked again during the fall drawdown (see figure below from Taylor et al presentation at 2015 Willamette Science Review). Under the current Fall Creek operation, there is no way for juvenile Chinook to exit the dam safely during the peak months of May and June.



The entrainment study also indicated the lack of understanding of what happens to juvenile fish that enter the reservoir in spring and summer, including how many may move downstream immediately compared to those that rear in the reservoir and move out through the RO during drawdown. How many juvenile fish die before leaving the reservoir is also not well understood. In 2013, the entrainment study started in May and found that wild juvenile Chinook migrated through the fish horns in every month of the sampling period (May – October), with peak migration (83%) occurred in the last nine days of May and the month of June. The remainder of the fish migrated out at nearly equal percentages from July – October. Moreover, the peak of migration for wild Chinook occurred when the reservoir was near maximum conservation pool (830 ft MSL) and before the reservoir's epilimnion increased dramatically.

The proposed drawdown and delayed refill for RO repair (as described in MOC 16FAL01) offers an opportunity to gain additional information about fish emigration. ODFW recommends the Corps gather data on fish passage during the drawdown and delayed refill. For example, screw traps could be placed at the head of reservoir and the tailrace to determine if fish are entering the reservoir and able to exit the reservoir during this time. The Corps could subsequently evaluate adult returns from juvenile cohorts passed under the alternative operation to determine if adult age at return differs from cohorts passed during typical operations.

Additionally, ODFW recommends the Corps consider extending the drawdown period to allow fish to emigrate from the reservoir via the RO through the month of June. This would allow the Corps to evaluate fish emigration under the alternative operation with the RO open through their natural emigration timing (numbers, timing, and size of fish entering and exiting the reservoir), as well as evaluate adult returns (including age at return and potential implications for productivity).

The additional data collection and longer drawdown period would take advantage of the proposed RO repair operation and allow an assessment of potential improvements to the fish passage operation (winter drawdown) that currently occurs at Fall Creek Dam.

If you have any questions about these comments, please let me know.

Sincerely,



Bernadette Graham Hudson

cc: (sent electronically)

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References:

Normandeau and USACE. 2014. Estimate of Direct Effects of Downstream Passage through the Fish Horns at Fall Creek Dam.

Taylor, G., D. Garletts, C. Helms, T. Pierce, J. Dalgliesh, T. Berling, and K. Rayfield. Fall Creek Overview: Adult Returns and Juvenile Outmigration Data. Presentation at the 2015 Willamette Science Review.