CENWP-OD 28 August 2019

MEMORANDUM FOR THE RECORD

TITLE - 19FOS06 MFR Temperature Operations below Foster tailrace
DATE - 28 August 2019
PROJECT - Foster Dam

Description of the problem
Temperatures currently being released from Foster using the turbines are proving to be too cold for optimal spring Chinook salmon migration up the adult ladder and into the fish collection facility. Ladder and river temperatures this year have been running cooler than average, spring Chinook salmon returns are lower, and only about one quarter of the necessary hatchery brood stock have been captured to date. This is likely impacting unmarked spring Chinook salmon returns as well. One option to modify the temperature in Foster's tailrace is to spill from the top of Foster reservoir through the fish weir. This will increase downstream temperatures and likely bring more fish upstream in close proximity of the ladder.

Type of change/outage required
Outflow from Foster reservoir will be increased to 1,200 cfs for spawning spring Chinook salmon below Foster Dam on the South Santiam River on September 1 to motivate fish to move into spawning areas and start actively spawning. These flows are generally released through the Foster turbine. This MFR will require approximately 500 cfs spill thru the fish weir and 700 cfs thru the turbine. To achieve this much spill from the weir, the reservoir will be raised 1.25 feet to elevation 637 feet. Water from Green Peter reservoir will be used to fill Foster reservoir. Ladder operations were also changed to aid in fish collection (see attachment 1).

Dates of impacts
The fish weir would be utilized to adjust the temperature in the Foster tailrace in the month of September. The operation will end when a mobile crane comes to remove the weir and stop logs. This activity is scheduled on or slightly before September 30, 2019.

Expected impacts on fish
The expected outcome is that increased temperature in the Foster tailrace will attract spring Chinook salmon to the adult ladder. However, we have also seen that the new weir that allows downstream fish passage has a better attraction signature than the old weir. One impact of this operation could be that fish residing in the reservoir will be attracted to pass downstream through the fish weir. From previous studies, increased levels of fish injury and mortality have occurred when passing fish through this passage route during high pool. Biologists will be observing upstream adult fish attraction to the ladder and downstream passage through the weir and report the findings at the conclusion of this operation.

Expected impacts on facility/generation
Foster dam would generate ~10 MW per hour at elevation 637 feet releasing 1,200 cfs. It is expected that Foster dam will generate ~6 MW per hour at elevation 637 feet releasing 700 cfs. For the period September 1-30 this will be a loss of 2,880 MWh of energy. In September 2019 the month average estimate of this loss is $ 77,760.00 at $27.00 per MWh (average). Using the EPA conversion factor of 1,559 lbs CO2/MWh, this is an increase of 4,489,920 lbs. of CO2 to the atmosphere.

(ref: https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references)

Comments from agencies
See attachment 1

Final Outcome
See attachment 1

Please email or call with questions or concerns.
Thank you,

Chris Walker
NWP Operations Division Fishery Section
503.808.4316
Christopher.E.Walker@usace.army.mil