

Project Name	Mayfield downstream fish passage evaluations 2016
Date Proposal Submitted	2/23/2016
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FTC Decision and Justification
 At the April 5, 2016 FTC meeting the Cowlitz Fisheries Technical Committee agreed to approve Decision Document 2016-3.

Proposed Decision or Consideration
 Tacoma recommends focusing on Chinook juveniles in 2016. The 2016 work plan will repeat the 2015 study approach using passive integrated transponder (PIT) tags for three variables; baseline conditions, all four attraction pumps on, and routine secondary separator drawdowns. In addition, a systematic survey of juvenile Chinook fish health will be conducted. In 2016 the operational variables will be sequenced with the four pump operation preceding drawdown to determine if there is an additive benefit. Tacoma does not recommend using active tags in 2016 while a Juvenile Bypass System design solution is developed during the 2016 study year. The design will be based on the 2013-2016 study results.

Background
 Between 2013 and 2015 a three year evaluation of Fish Passage Survival at Mayfield Dam was initiated. The 2013 study indicated that a large proportion of tagged fish (89% of coho; 84% of steelhead; and 58% of Chinook) released into the forebay above the louvers, entered the juvenile bypass system. However, dam passage survival for all three species was lower than anticipated. As a result of the 2013 findings, the scope of work for 2014 was adapted to focus primarily on investigations of fish survival and delays through the fish bypass system, and downstream migration past the Barrier Dam. Results of calculated smolt survival through the bypass system varied by species (Chinook 28%; steelhead 98%; and Coho 80%). Chinook smolts also exhibited significant delays in passing from the secondary separator through the bypass to the counting house, requiring, on average, 9.7 days before exiting the secondary separator. For coho smolt, relatively long holding times were observed at the Barrier Dam, ranging from 6.0 days for bypass-released fish, and 6.7 days for tailrace-released fish.

During the 2015 Chinook smolt outmigration, three JBS operational regimes were also implemented for evaluation. These included: 1) secondary separator operation using 4 pumps; 2) complete drawdown of the secondary separator; and 3) baseline pump operation (which follows project inflow). One week into the evaluation period one of the attraction pumps failed and the 4-pump test was reduced to a max pump or 3-pump test. Results indicated significant improvement for Chinook passing through the secondary separator during the drawdown operation for both acoustic and PIT-tagged fish (89.6% vs 62.5%, and 65.3%; and 96.5% vs 83.8%, and 89.4% for the Drawdown vs 4-pump and Baseline operations, respectively). Results also showed that overall survival through the juvenile bypass system was improved during this operation (22.7%

increase). However, overall juvenile bypass survival was still only for 41.2% for Chinook in the optimal configuration.

Additionally, during 2015 survival between the transport tank and release pipe was measured at 44.9% by virtue of virtual releases across all operating conditions. The average measured travel time in this reach was 3.83 days. However, measures in this section were potentially limited by battery life by virtue of delay earlier in the Juvenile Bypass System.

Coordination Need

Tacoma Power will hire a consultant to develop the 2016 database so that it integrates with PTAGIS. Tacoma Power will work with WDFW and consultant to evaluate fish health and evaluate 2016 year results with 2015 results for reach survival from lower apex through counting house.

Summary of Potential Impacts

PIT tagged Chinook smolts released in Mayfield Dam will be used for Performance Monitoring to evaluate Juvenile Bypass System reach specific survival and travel time during variable operations. This is anticipated to include up to 15 groups 150 PIT tagged Chinook for a total of 2,250 fish.