

**MEMORANDUM FOR THE RECORD 22TDA04 MFR Wasco PUD test results**

***SUBJECT: Biological testing of bypass leg of switch gate at the new sampling facility being built at the PUD facility on the north shore of The Dalles Dam.***

Northern Wasco County PUD is building a new sampling facility for their hydro facility on the north shore of The Dalles Dam. The PUD uses the 800 cfs of water that provides attraction flows to the fishway entrance to power their 5 MW generator. The water passes through a dewatering structure fitted with a diagonal wall screen, the fish and about 10 cfs flow out the downstream end and into a bypass pipe that conveys the fish to the tailrace. To divert fish from the bypass pipe to the new collection facility (not yet completed), a switch gate was installed. The PUD prioritized installation of the switch gate so the bypass would be operational by April 1.

On Tuesday, March 29, 2022, the PUD conducted biological testing to assess passage conditions through the bypass leg of the new switch gate.

Testing consisted of 4 replicates and one control group with 60 fish in each group. The fish, Coho salmon from the Klickitat Salmon Hatchery, were examined for injury or descaling prior to release. No descaling or injuries were noted in the fish used. The 4 replicates were released into the entrance of the bypass pipe and the control fish were released directly into the net pen. Fish were recaptured with a net pen suspended by a crane under the bypass pipe outfall.

Overall, 92% of all fish released were recaptured. Fresh descaling was observed on 4 fish, 2 with over 20% descaling. One of the descaled fish was from the control group which was done last and experienced the most trouble with net pen positioning, see discussion below. Two fish had minor split fins that were not recorded in the prerelease exams.

No matter the amount of planning for an activity such as this, things go wrong and you learn as you go. The first replicate, the net pen was only in position for 6 minutes and we only recaptured 24 fish. We observed many of those missing fish holding in the uncovered switch gate. It's also likely that some of the missing fish exited after we pulled the net pen for replicate 1 and before placing the net pen for replicate 2.

For the second replicate, we increased the "fishing" time to 18 minutes and recaptured 73 fish, so fishing time improved recapture rate. However, some fish could still be seen delaying in the switch gate so we decided to cover it for replicates 3 and 4. We recaptured 58 fish in replicate 3 and 61 fish in replicate 4.

Positioning the net pen seemed to get increasingly difficult as we progressed with the testing. Bypass pipe discharge pushing the net pen around necessitated that the bypass pipe discharge be turned off for replicates 3 and 4. Also, the wind picked up as testing progressed and may have been a factor in the increasing difficulty of positioning the net pen. It is also possible that bypass pipe discharge increased. The dewatering structure weir gate is programmed to close if the unit is shut down so the discharge volume had to be "manually" set and measured with a tape measure. This was challenging and may have resulted in more water discharging from the bypass pipe than if the system had been in "auto".

Implementing the control group release turned out to be the most challenging. The net pen was even further out of the water and getting the release hose in position was difficult.

I attached a small spreadsheet summarizing the results and I'm working on a more detailed report that will be distributed when finished.

- A. Species – Coho salmon (*Oncorhynchus kisutch*)
- B. Origin – Klickitat Salmon Hatchery
- C. Length – 101.9 mm
- D. Marks and tags – none
- E. Marks and Injuries found on carcass – NA
- F. Cause and Time of Death – NA
- G. Future and Preventative Measures – NA

**Test Results**

Recapture Rates	Recapture Rates			Partially	%	#	%	# Injured	% Injured	# Morts	% Morts
	Released	Recaptured	% Recap	Descaled	Descaled	Descaled	Descaled				
Replicate 1	60	24	40.0%								
Replicate 2	60	73	121.6%	1	1.60%						
Replicate 3	60	58	96.6%	1	1.60%						
Replicate 4	60	61	101.6%			1	1.60%			4 fry	
Control	60	60	100.0%			1	1.60%			2 fry	
Totals	300	276	92.0%								

Partially Descaled = 3 to 19 % scale loss on either side  
 Descaled = 20% scale loss on either side



Net pen improperly positioned under bypass discharge, too far out of the water. This problem increased as testing progressed, lowering the net resulted in it being pushed around out of position. Slings that were too short also made it difficult to position it as far into the water as desired.

Rick Martinson