

**WILLAMETTE VALLEY FISH PASSAGE MONITORING VIA ROTARY SCREW TRAPS –
Bi-monthly Report: October 15, 2021–October 31, 2021 - Revision 1**

November 17, 2021

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Report Period: October 15 to October 31, 2021

Report No.: 2021 Willamette RST Bi-Weekly Report 10/15 – 10/31 by EAS

**Re: WILLAMETTE VALLEY FISH PASSAGE MONITORING VIA ROTARY
SCREW TRAPS**

Project Schedule

Table 1. Project Schedule

Site	Task	Start	End	Days
Hills Creek RO and PWR	Deployment	10/12/21	10/12/21	1
Hills Creek RO	Operation	10/21/21	3/15/22	146
Hills Creek PWR	Operation	10/23/21	3/15/22	144
Hills Creek	Trap Efficiency Release (1,200 fish, 600 per route) ^a	11/30/21	11/30/21	1
Cougar Dam RST	Operation	12/01/21	12/31/22	394
Big Cliff Dam RST	Operation	12/01/21	2/15/22	291
Big Cliff Dam RST	Operation	3/15/21	10/15/22	

^a Tentative schedule of first trap release.

Summary of Rotary Screw Trap Data

Rotary screw traps (RSTs) were operated at one location in the southern Willamette river watershed: on the Middle Fork Willamette River below Hills Creek Dam (Hills Creek). The location of the Hills Creek sampling site Regulating Outlet (RO) and Powerhouse RST's are depicted in Figure 1. Sampling began at the Hills Creek site on October 21. Sampling dates and catch summaries are provided in Tables 1 and 2, respectively.



Figure 1. Hills Creek Dam RST Locations

Figure 2. Sampling Dates for Reporting Period

Site	Total Sampling Period Start	Current Reporting Period Start	Current Reporting Period End	Days Sampled This Period	Total Days Sampled
Hills Creek RO	10/21/21	10/21/21	10/31/21	10 days	10 days
Hills Creek PWR	10/21/21	10/23/21	10/31/21	8 days	8 days

Table 2. Willamette Valley Rotary Screw Trap Monitoring Catch Summary

Site	Species	Catch (Reporting Period)	Recaptures (Reporting Period)	Total Catch	Total Recaptures
Hills Creek	CHS	3	0	3	0

Middle Fork Willamette – Hills Creek Dam

Target Species

The most recent reporting period began on 16 October and ended on 31 October. There were a total of 3 Chinook salmon (CHS) during the 10-day sampling period (Figure 2). Sampling durations were 66% for RO RST and 46% for Powerhouse RST, where a value of 1 is sampling for the entire duration of the scheduled period. Table 3 provides life stage, length, and weight data for all Chinook salmon that have been caught at the Hills Creek site to-date.

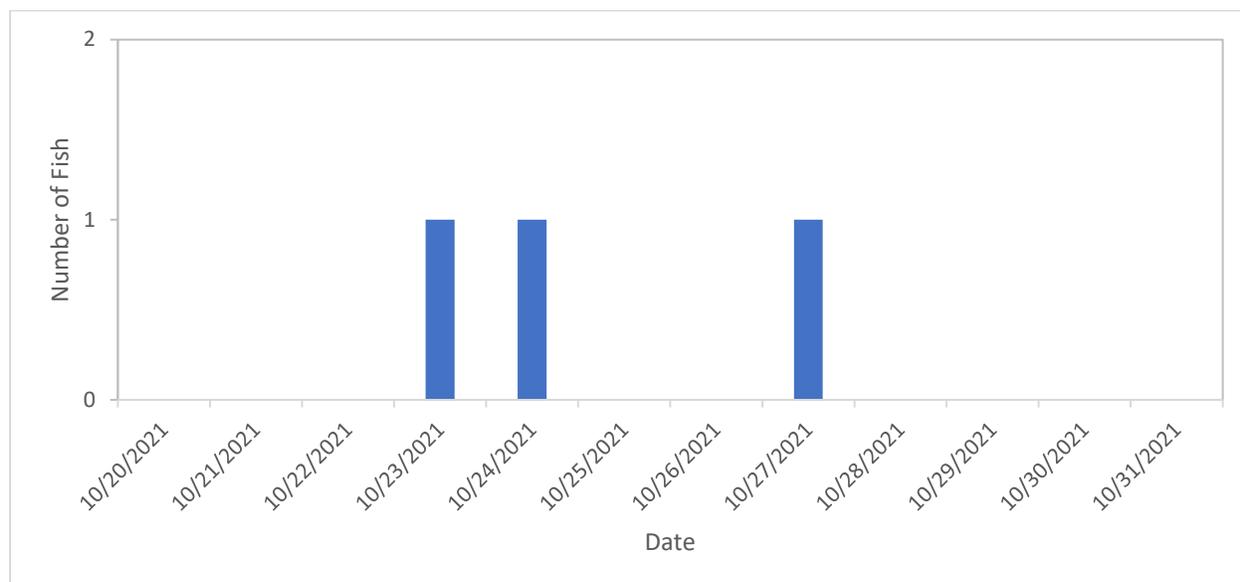


Figure 3. Chinook Captured Per Day 10/20/2021 to 10/31/2021

Table 3. Descriptive Statistics of Target Species Captured at the Hills Creek Dam

Site	Life stage	Collected	Length (mm)			Weight (g)		
			Min	Max	Mean	Min	Max	Mean
CHS	Yearling	3 ^a	159	243	201	39.3	164.4	101.9

^a One Chinook was missing head, and no weight or length was recorded.

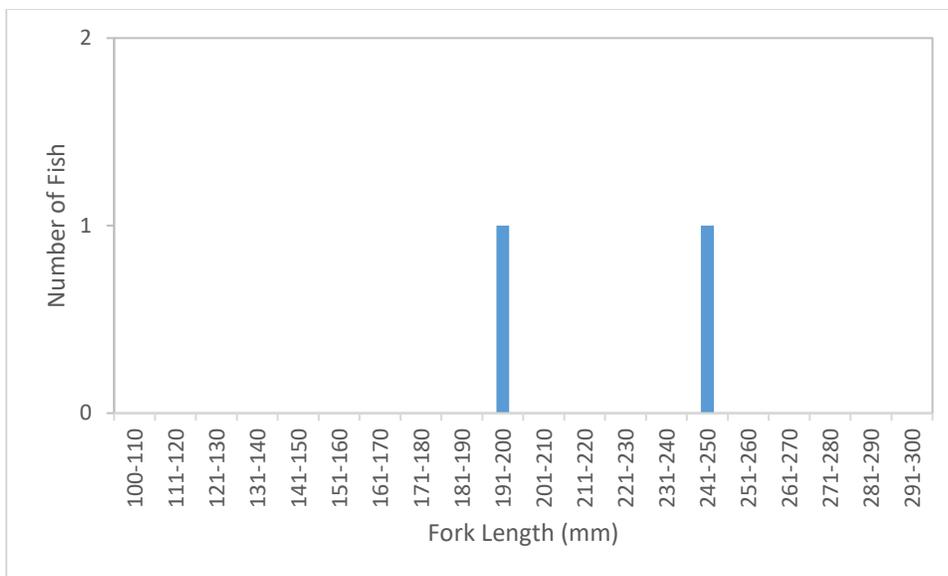


Figure 4. Length Frequency of Juvenile Chinook

Injuries and Copepod Infection

Partial descaling <20% was observed on 1 of 1 target species collected at the RO RST (100%). Partial descaling <20% was observed on 1 target species individual and the 2nd target species individual had >20% descaling. All 3 target species collected had copepods. Of the chinook captured, one displayed bloody eye (hemorrhage) and operculum damage. There was 1 Chinook mortality collected in the Powerhouse RST.

Table 4. Number of Descaled and Partially Descaled Chinook Salmon.

Site	# CHS Collected	# DSC* <20%	# DSC* >20%	# with Body Injuries	# with Eye Injuries	# with COP* In B.C.	# with COP* on Fins	Mortalities
Hills Creek RO	1	1	0	1	1	1	1	0
Hills Creek PWR	2	1	1	1	0	1	1	1

*DSC=Descaled, COP=Copepods

Non-Target Species

A total of 26 non-target species were captured during the reporting period: RST. All five of the crappie that were collected in the RO were mortalities and one showed signs Gas Bubble Trauma (GBT).

Table 5. Summary of Non-target Species (Hills Creek).

Species	RO Capture	RO mortality	PWR Capture	PWR mortality	Total live	Total Mortality
Bluegill	0	0	1	0	1	0
Crappie	5	5	0	0	5	5
Redside Shiners	5	0	3	0	8	0
Sculpin	4	0	7	0	11	0
Longnose dace	0	0	1	0	1	0
<i>O. mykiss</i>	3	0	2	0	5	0
Totals	14	5	12	0	26	5

Stream Statistics

Basic stream statistics at the Hills Creek site were calculated from data downloaded from the U.S. Geological Survey stream gage number 14145110. Gage height (feet) is the only metric provided at this gage. Recent values for instantaneous gage height ranged from 1,225.2 feet to 1,224.0 feet (mean: 692.6 feet). Values for instantaneous gage height across the entire sampling period ranged from 690.4 feet to 695 feet (mean: 692.9 feet). Figure 3 shows instantaneous gage height along with daily catch of juvenile Chinook salmon.

Stream temperatures were recorded every 2 hours for the both the RO RST and the Powerhouse RST (Figures 4 and 5). The temperature probes for the Powerhouse RST and RO RST were installed at 16:00 and 15:00 on 21 October, respectively.

Flows through the Powerhouse and RO during the reporting period averaged 630.6 and 188.5 cubic feet per second (cfs) respectively. The 24-hour average flows for the powerhouse ranged from 0 to 842.9 cfs, while the 24-hour average flows for the RO ranged from 0 to 781.3 cfs (Figure 7). The Powerhouse RST rotation speeds averaged 37.4 rpm, with a minimum speed of 27rpm on October 22 and 23, and maximum speed of 43rpm on October 26 and 29. The RO RST rotation speeds averaged 33.7rpm, with a minimum speed of 23rpm on October 24 and maximum speed of 39rpm on October 29 (Figure 8). Catch per unit of effort (CPUE) data are summarized in Table 6.

Table 6. Summary of salmonid CPUE, Hills Creek.

Description	Chinook	
	RO (5ft)	PWR(8ft)
Catch	1	2
Effort (hrs)	222.65	178.05
CPUE (fish/hr)	0.004	0.011

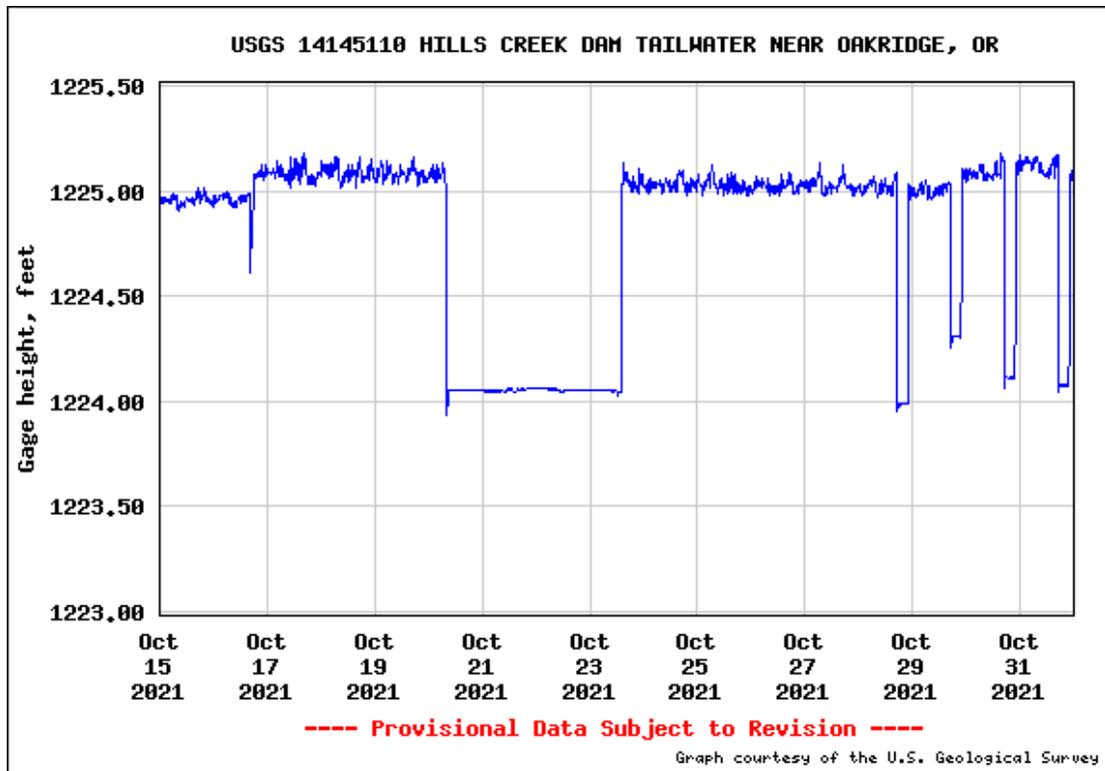


Figure 5. Gage Height (feet); below Hills Creek Dam, Middle Fork Willamette River

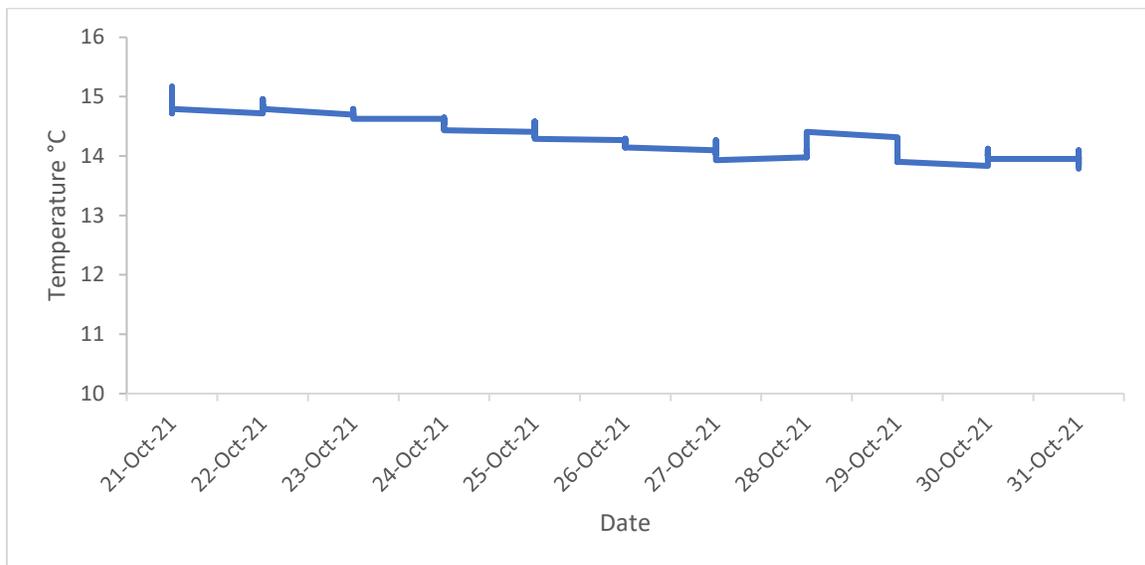


Figure 6. Temperature at RO RST

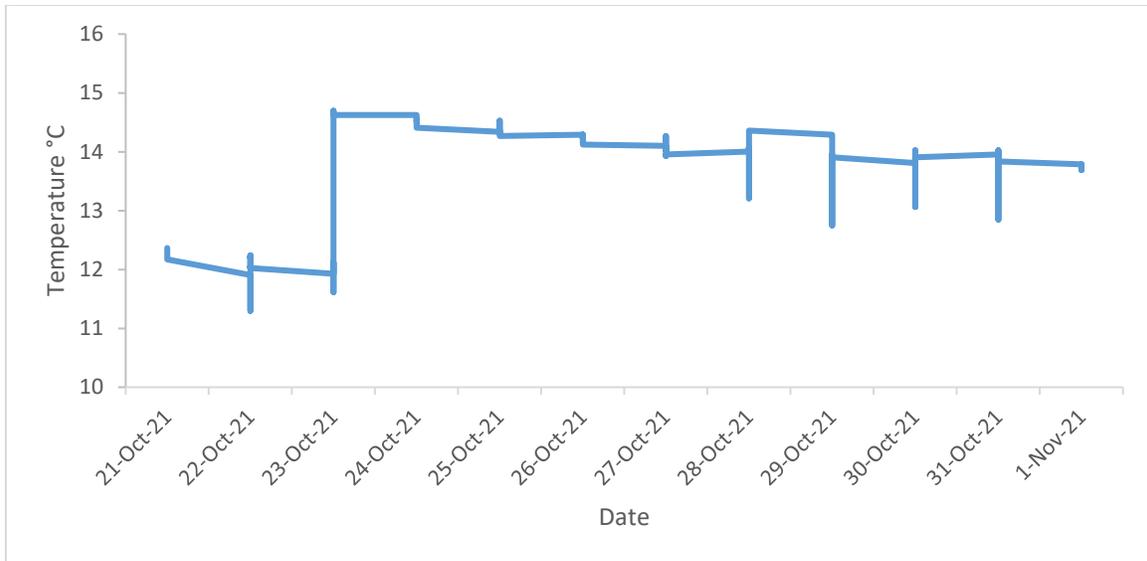


Figure 7. Temperature at Powerhouse RST

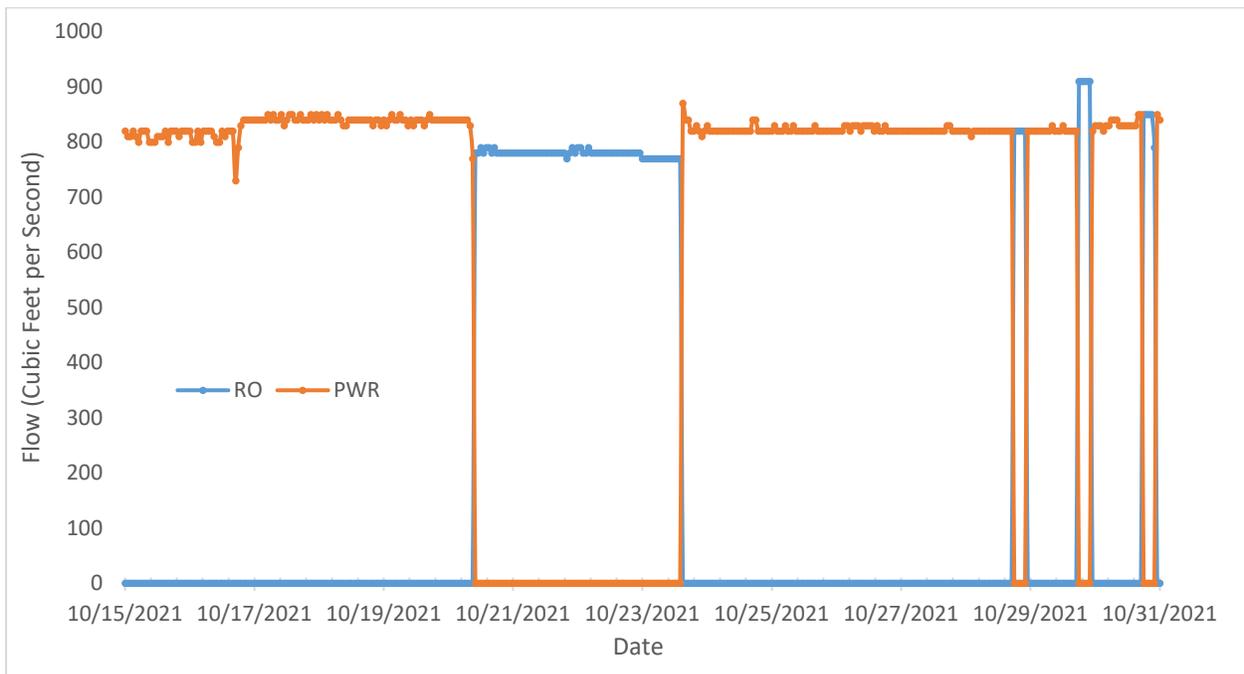


Figure 8. Hourly Flows PWR vs. RO

Issues Encountered

None during this reporting period.

Upcoming USACE Support Services

None.