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Report Period:	September 16th to September 30th, 2022
Report No.:	2022 Willamette RST Bi-Weekly Report 09/16 – 09/30 by EAS
Re:	**WILLAMETTE VALLEY FISH PASSAGE MONITORING VIA ROTARY SCREW TRAPS**

Project Schedule

Table 1. Project Schedule

Site	Task	Start	End	Days
Big Cliff Dam RST	Operation	12/01/2021	02/15/2022	292
Big Cliff Dam RST	Operation	03/15/2022	10/15/2022	
Big Cliff Dam Tailrace	Trap Efficiency Release (1,000 Fish)	12/22/2021	12/22/2021	1
Big Cliff Dam Tailrace	Temporary Trap Removal and Install	05/06/2022	05/13/2022	7
Big Cliff Dam Tailrace	Trap Efficiency Release (1,000 Fish)	05/25/2022	05/25/2025	1
Big Cliff Dam Tailrace	Trap Efficiency Release (1,000 Fish)	08/09/2022	08/09/2022	1
Big Cliff Dam Tailrace	Trap Efficiency Release (1,000 Fish)	09/30/2022	09/30/2022	1
Green Peter Tailrace- Middle Santiam River RST	Trap Install	03/02/2022	03/02/2022	1
Green Peter Tailrace- Middle Santiam River RST	Operation	03/03/2022	06/30/2022	120
Green Peter Tailrace- Middle Santiam River RST	Trap Efficiency Release (643 Fish)	03/29/2022	03/29/2022	1
Green Peter Tailrace- Middle Santiam River RST	Trap Efficiency Release (521 Fish)	04/30/2022	04/30/2022	1
Green Peter Tailrace- Middle Santiam River RST	Temporary Trap Removal	05/12/2022	05/12/2022	1
Foster Dam Head of Reservoir- South Santiam River RST	Trap Install	03/16/2022	03/16/2022	1
Foster Dam Head of Reservoir- South Santiam River RST	Operation	03/10/2022	06/30/2022	113
Foster Dam Head of Reservoir- South Santiam River RST	Trap Removal	07/01/2022	07/01/2022	1
Foster Dam Head of Reservoir- South Santiam River RST	Trap Install	09/02/2022	09/02/2022	1
Foster Dam Head of Reservoir- South Santiam River RST	Trapping Efficiency Release (1000 fish)	09/29/2022	09/29/2022	1
Cougar Dam RST	Operation	11/30/2021	11/30/2022	366
Cougar Dam	Trap Efficiency Release (1,200 Fish, 600 per route)	01/19/2022	01/19/2022	1
Cougar Dam	Trap Efficiency Release (735 Fish, ~365 per route)	04/20/2022	04/20/2022	1
Cougar Dam	Trap Efficiency Release (993 Fish, RO route)	05/15/2022	05/15/2022	1
Cougar Dam	Trap Efficiency Release	07/19/2022	07/19/2022	1

	(500 Fish, PH route)			
Cougar Dam	Trap Efficiency Release (501 Fish, PH route)	08/11/2022	08/11/2022	1
Cougar Dam Head of Reservoir	Highline and Trap Install	03/07/2022	03/07/2022	1
Cougar Dam Head of Reservoir	Operation	03/08/2022	06/30/2022	115
Cougar Dam Head of Reservoir	Trap Efficiency Release (806 Fish)	03/18/2022	03/18/2022	1
Cougar Dam Head of Reservoir	Trap Efficiency Release (500 Fish)	05/19/2022	05/19/2022	1
Cougar Dam Head of Reservoir	Trap Efficiency Release (515 Fish)	06/23/2022	06/23/2022	1
Cougar Dam Head of Reservoir	Trap Removal	07/01/2022	07/01/2022	1
Cougar Dam Head of Reservoir	Highline Install	09/14/2022	09/14/2022	1
Cougar Dam Head of Reservoir	Trap Install	09/16/2022	09/16/2022	1
Cougar Dam Head of Reservoir	Trap Efficiency Release (551 Fish)	09/22/2022	09/22/2022	1
Dexter Dam Tailrace RST	Highline Install	03/02/2022	03/02/2022	1
Dexter Dam Tailrace RST	Trap Install	03/03/2022	03/03/2022	1
Dexter Dam Tailrace RST	Operation	03/07/2022	12/16/2022	285
Dexter Dam Tailrace RST	Trap Efficiency Release (988 Fish)	03/23/2022	03/23/2022	1
Dexter Dam Tailrace RST	Trap Efficiency Release (1000 Fish)	05/04/2022	05/04/2022	1
Dexter Dam Tailrace RST	Trap Efficiency Release (1019 Fish)	05/24/2022	05/24/2022	1
Dexter Dam Tailrace RST	Trap Efficiency Release (981 Fish)	07/21/2022	07/21/2022	1
Lookout Dam Tailrace RSTs	Operation	03/15/2022	07/31/2022	139
Lookout Dam Tailrace RSTs	Trap Efficiency Release (1,013 fish, PWR route)	04/13/2022	04/13/2022	1
Lookout Point Head of Reservoir RST	Trap Install	03/06/2022	03/06/2022	1
Lookout Point Head of Reservoir RST	Operation	03/07/2022	12/16/2022	285
Lookout Point Head of Reservoir RST	Trap Efficiency Release (993 fish)	04/05/2022	04/05/2022	1
Lookout Point Head of Reservoir RST	Trap Efficiency Release (989 fish)	04/14/2022	04/14/2022	1
Lookout Point Head of Reservoir RST	Trap Efficiency Release (1007 fish)	05/18/2022	05/18/2022	1
Lookout Point Head of Reservoir RST	Trap Efficiency Release (1005 fish)	07/20/2022	07/20/2022	1
Fall Creek Dam Tailrace RST	Operation	03/15/2022	07/15/2022	123
Fall Creek Dam Tailrace RST	Trap Efficiency Release (518 fish)	06/08/2022	06/08/2022	1
Fall Creek Dam Tailrace RST	Trap Efficiency Release (513 fish)	06/30/2022	06/30/2022	1
Fall Creek Dam Tailrace RST	Trap Efficiency Release (500 fish)	07/13/2022	07/13/2022	1
Fall Creek Head of Reservoir RST	Trap and Highline Install	01/11/2022	01/11/2022	1
Fall Creek Head of Reservoir RST	Operation	01/02/2022	05/31/2022	150
Fall Creek Head of Reservoir RST	Removal	06/02/2022	06/02/2022	1
Hills Creek Dam RO and PWR	Deployment	10/12/2021	10/12/2021	1

Hills Creek Dam RO	Operation	10/15/2021	03/01/2022	138
Hills Creek Dam PWR	Operation	10/15/2021	03/01/2022	138
Hills Creek Dam	Trap Efficiency Release (1,200 fish, 600 per route)	01/6/2022	01/6/2022	1
Hills Creek Dam	Trap Efficiency Release (1,200 fish, 600 per route)	02/16/2022	02/16/2022	1
Hills Creek Dam	Trap Efficiency Release (1,200 fish, 600 per route)	02/23/2022	02/23/2022	1
Hills Creek Dam RSTs	Trap Removal	03/01/2022	03/01/2022	1
Hills Creek Dam RSTs	Trap Install	09/14/2022	09/14/2022	1

Summary of Rotary Screw Trap Data

Rotary screw traps (RSTs) have been operated at eleven locations in the southern Willamette River watershed. For this reporting period, traps were operated at the following eight locations: Big Cliff Dam, Foster Dam Head of Reservoir- South Santiam, Cougar Dam, Cougar Dam Head of Reservoir, Dexter Dam Tailrace, Lookout Dam Tailrace, Lookout Point Head of Reservoir, and Hills Creek Dam. The Green Peter Dam Tailrace- Middle Santiam trap was removed on May 12th due to damage incurred to the highline. The trap at Fall Creek Dam was placed into a non-sampling position on July 16th at the end of the sampling period.

The RST's at Big Cliff Dam and Lookout Dam Tailrace started sampling on March 15th. On March 1st the Middle Fork Willamette River below Hills Creek Dam RST's were removed for the sampling season in conjunction with the end of RO spill and to prioritize the limited number of screw traps to other locations. Sampling at Hills Creek Dam resumed on September 15th.

Below Dam sites that include both RO and PWR to monitor passage routes include South Fork McKenzie River below Cougar Dam and on the Middle Fork of the Willamette River in the Lookout Dam Tailrace, and Hills Creek Dam. Below dam sites that include one RST to monitor passage include Big Cliff Dam, Green Peter Tailrace- Middle Santiam, the Middle Fork of the Willamette River below Dexter Dam and Fall Creek Dam Tailrace which is a tributary on the Middle Fork of the Willamette. At the Green Peter Dam Tailrace, the single RST is placed to sample fish passing through spillways, regulating outlets, and powerhouse outlets. The RST at Dexter Dam is placed to monitor fish passage through the spillways and powerhouse outlets. The RST in the Fall Creek Dam Tailrace is placed in a position to sample fish passing through the regulating outlet.

The RST on the North Santiam River below Big Cliff Dam was not sampled while fish passage measures were not being implemented from 16 February 2022 to 14 March 2022. Sampling resumed on 15 March 2022 in accordance with Task 2.2.

Above reservoir sites include Fall Creek Head of Reservoir, Lookout Point Head of Reservoir on the Middle Fork Willamette River, Foster Dam Head of Reservoir- South Santiam, and Cougar Dam Head of Reservoir on the South Fork McKenzie.

Sampling start dates are included in Table 2, and season total collection numbers are displayed in Table 3. The locations of the RST's are depicted in Figures 1 through 8.

Figure 1. Big Cliff RST Location

Figure 2. Foster Dam Head of Reservoir- South Santiam RST Location

Figure 3. Cougar Dam RST Locations

Figure 4. Cougar Dam Head of Reservoir RST Location

Figure 5. Fall Creek Dam Tailrace RST Location

Figure 6. Dexter Dam RST Location

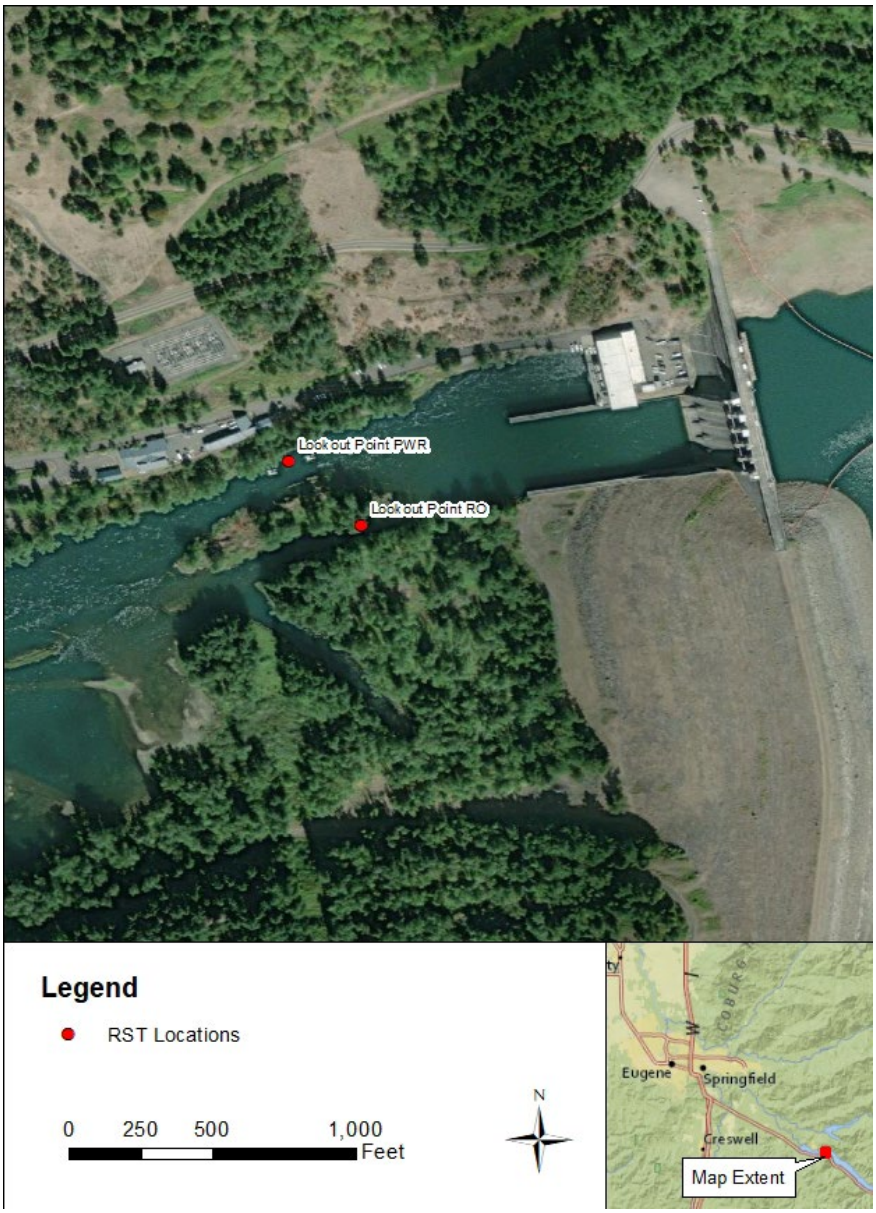


Figure 7. Lookout Point Dam Tailrace RST Location

Figure 8. Lookout Point Head of Reservoir RST Location

Figure 9. Hills Creek Dam RST Locations

Table 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
Big Cliff Dam	12/1/2021	9/16/2022	9/30/2022	15	259
Green Peter Tailrace- Middle Santiam River	3/2/2022	9/16/2022	9/30/2022	0	67
Foster Dam Head of Reservoir- South Santiam	3/16/2022	9/16/2022	9/30/2022	15	129
Cougar Dam PH	12/1/2021	9/16/2022	9/30/2022	15	295
Cougar Dam RO	12/1/2021	9/16/2022	9/30/2022	15	297
Cougar Dam Head of Reservoir	3/7/2022	9/16/2022	9/30/2022	15	114
Fall Creek Dam Tailrace*	3/15/2022	9/16/2022	9/30/2022	0	123
Dexter Dam Tailrace	3/7/2022	9/16/2022	9/30/2022	14	204
Lookout Point Dam PH	3/15/2022	9/16/2022	9/30/2022	14	181
Lookout Point Dam Spill	3/15/2022	9/16/2022	9/30/2022	14	181
Lookout Point Head of Reservoir	3/10/2022	9/16/2022	9/30/2022	13	197
Hills Creek Dam	9/16/2022	9/16/2022	9/30/2022	13	13

*Fall Creek Dam Tailrace trap was being operated by the Corps until EAS began sampling the site on March 15th per Task 7.1

Table 3. Willamette Valley Rotary Screw Trap Monitoring Catch Summary

Site	Species	Catch (Reporting Period)	Recaptures (Reporting Period)	Total Catch	Total Recaptures
Big Cliff Dam	CHS	30	0	1087	153
Big Cliff Dam	STW	2	0	60	0
Green Peter Tailrace- Middle Santiam	CHS	0	0	0	13
Green Peter Tailrace- Middle Santiam	STW	0	0	6	0
Foster Dam Head of Reservoir- South Santiam	CHS	0	0	66	0
Foster Dam Head of Reservoir- South Santiam	STW	0	0	90	1
Cougar Dam	CHS	63	0	1361	392
Cougar Dam Head of Reservoir	CHS	43	56	619	127
Fall Creek Dam Tailrace	CHS	0	0	0	11
Dexter Dam Tailrace	CHS	1	0	97	113
Lookout Point Dam	CHS	0	0	78	2
Lookout Point Head of Reservoir	CHS	2	0	103	206
Hills Creek Dam	CHS	5	0	100	0

North Santiam – Big Cliff Dam

The RST on the North Santiam River below Big Cliff Dam was not sampled while fish passage measures were not being implemented from 16 February 2022 to 14 March 2022. Sampling resumed on 15 March 2022 in accordance with Task 2.2.

Target Species

This reporting period began on September 16 and ended on September 30. There were a total of 30 Chinook Salmon (CHS) and 2 Winter Steelhead (STW) captured during the 15-day sampling period (Figure 10). Sampling duration was 100% for the RST. Table 4 provides life stage, length, and weight data for all Chinook Salmon and Winter Steelhead that have been caught at the Big Cliff Dam site to-date and for the reporting period. Figure 11 shows length frequency data to-date.

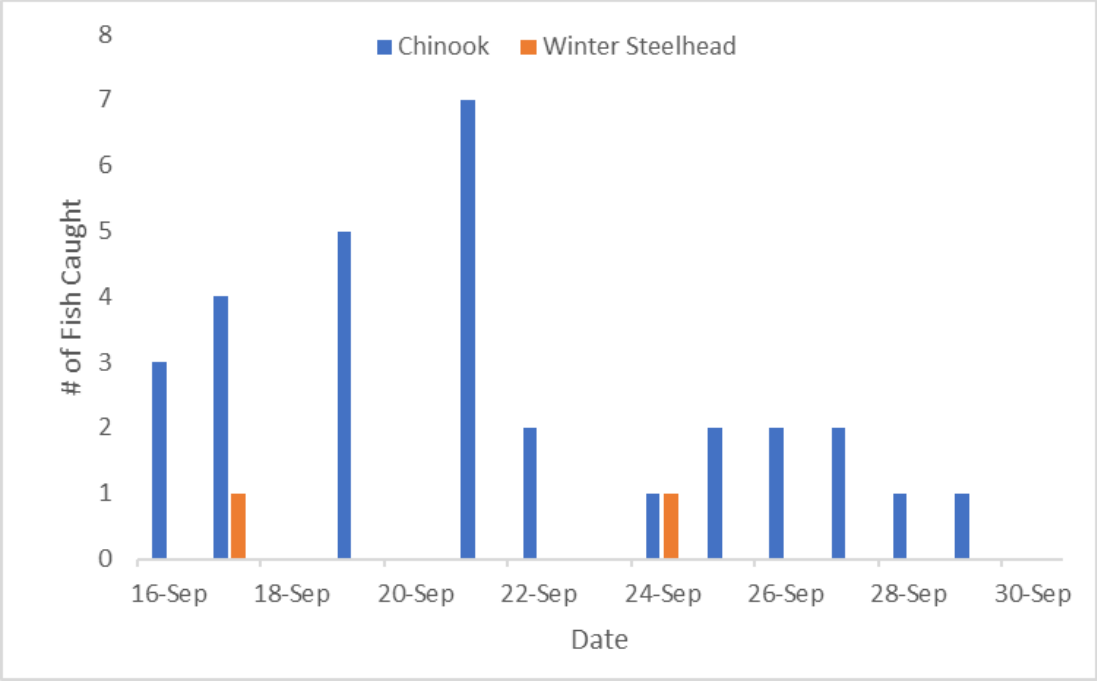


Figure 10. Chinook and Winter Steelhead Captured per day 09/16/2022 to 09/30/2022 (Big Cliff)

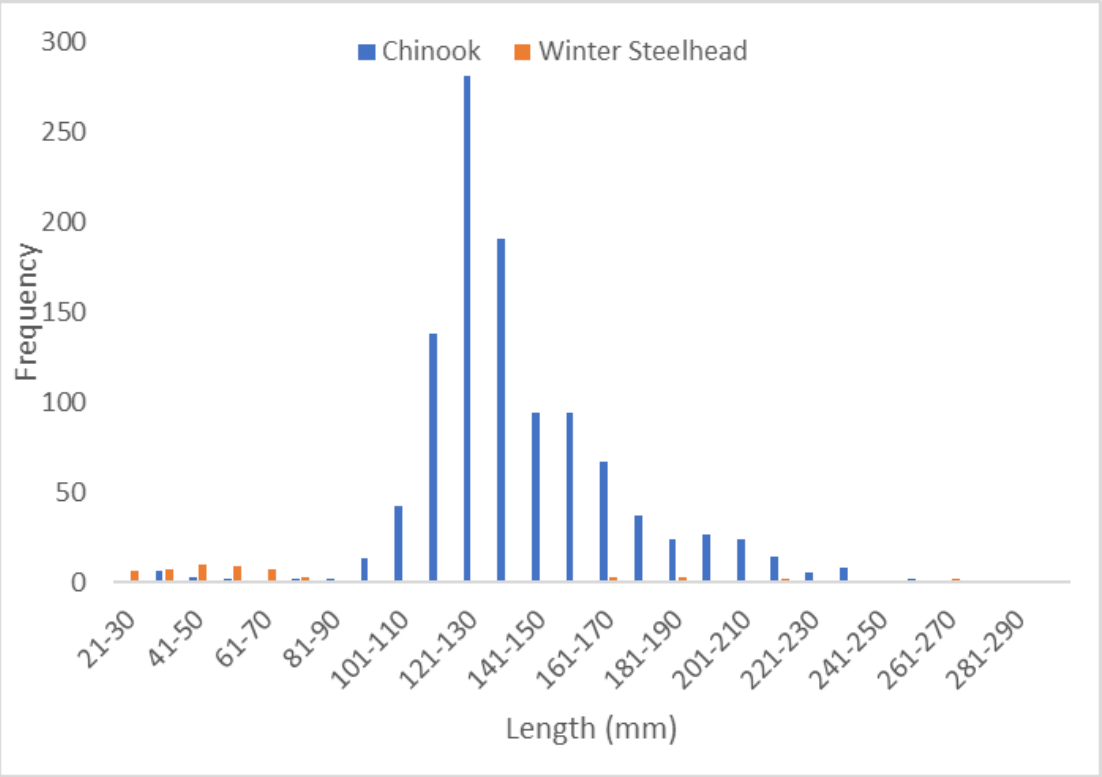


*Figure does not include fish without heads

Figure 11. Length Frequency of Juvenile Chinook and Winter Steelhead Sampled Season To-Date (Big Cliff)

Trapping Efficiency

A total of 1000 juvenile hatchery Chinook (sub-yearlings) were bismarck brown dyed, adipose clipped and released on 8/9/2022 below Big Cliff Dam. A total of 92 fish were recaptured in the 8ft trap. Trapping efficiency was 9.2%.

Trapping efficiency fish displayed minor descaling and fin damage. 6 fish also displayed operculum damage.

Big Cliff Dam	Release #	Recapture #	Capture Efficiency
8ft Trap	1000	92	9.2% (92/1000)

Table 4. Descriptive Statistics of Target Species Captured at Big Cliff Dam Season To-Date

To-Date (Since Dec. 01, 2021)											
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*			
					Min	Max	Mean	Min	Max	Mean	
Big Cliff	PWR	CHS	Fry	9	31	48	37.5	1.2	1.4	1.4	
		CHS	Parr	24	58	136	98.3	2.1	30.0	11.6	
		CHS	Smolt	1052	91	283	142.1	8.9	253.5	33.7	
		STW	Fry	27	21	52	40.1	1.1	1.9	1.6	
		STW	Parr	16	51	111	66.4	1.9	14.3	4.0	
		STW	Smolt	17	157	284	214.1	36.1	230.5	102.2	

*Fish that were missing heads are not included in length and weight calculations.

September 16-30, 2022											
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*			
					Min	Max	Mean	Min	Max	Mean	
Big Cliff	PWR	CHS	Fry	0	N/A	N/A	N/A	N/A	N/A	N/A	
		CHS	Parr	0	N/A	N/A	N/A	N/A	N/A	N/A	
		CHS	Smolt	30	127	251	153.5	21.5	148.9	42.4	
		STW	Fry	0	N/A	N/A	N/A	N/A	N/A	N/A	
		STW	Parr	1	76	76	76	4.3	4.3	4.3	
		STW	Smolt	1	284	284	284	181.5	181.5	181.5	

*Fish that were missing heads are not included in length and weight calculations.

24-Hour Post Collection Holding Trial

24 Spring Chinook and 2 Winter Steelhead were captured during the current reporting period and held for 24 hours. 2 Chinook (8.3%) and 1 Winter Steelhead (50.0%) died in holding.

Injuries and Copepod Infection

Partial descaling <20% was observed in 19 of the 30 Chinook captured (63.3%), 9 displayed descaling >20% (30.0%), 25 displayed body injury (83.3%), 1 had eye injury (3.3%), 29 had copepods present in the branchial cavity (96.9%) and 12 had copepods on fins (40.0%). 1 Chinook displayed gas bubble disease (3.3%). There were 6 mortalities (20.0%).

Partial descaling <20% was observed in 0 of the 2 Winter Steelhead captured (0.0%) and 0 displayed descaling >20% (0.0%), 2 displayed body injury (100%), 0 had eye injury (0.0%), 0 had copepods present in the branchial cavity (0.0%) and 1 had copepods on fins (50.0%). There were 0 mortalities (0.0%). Injury data is summarized in table 5.

Table 5. Number of Descaled, Bodily/Eye Injured, Copepod Infected and Dead Chinook Salmon and Winter Steelhead for Sampling Period. (Big Cliff Dam).

Site	Species	# Fish Collected	# DSC* <20%	# DSC* >20%	# with Body Injuries	# with Eye Injuries	# with COP* In B.C.	# with COP* on Fins	Mortalities
Big Cliff Dam	Chinook	30	19	9	25	1	29	12	6
Big Cliff Dam	Winter Steelhead	2	0	0	2	0	0	1	0

Non-Target Species

7 non-targets were captured during this sampling period. A summary of to-date non-target species catch and mortality numbers are listed in Table 6.

Table 6. Summary of Non-target Species (Big Cliff Dam)

Species	PWR Capture	PWR Mortality	Season Total	Season Total Mortality
Bluegill	4	0	64	10
Bullhead	0	0	5	0
Chinook (Adult)	0	0	2	1
Chinook (clipped)	0	0	9	0
Cutthroat	0	0	3	0
Kokanee	3	3	127	42
O. mykiss (clipped)	0	0	7	3
Pumpkinseed	0	0	76	5
Unknown	0	0	4	1
Mountain Whitefish	0	0	4	0
Totals	**7**	**3**	**301**	**62**

Stream Statistics

Basic stream statistics at the Big Cliff Dam site were calculated from data downloaded from U.S. Geological Survey stream gauge numbers 14181410 and 14181500. Gauge height (feet) is the only metric provided at gauge 14181410. Total dissolved gas (TDG) saturation data was received from gauge 14181500, 1 rkm downstream of the trap. During the reporting period, daily maximum values for instantaneous gauge height remained constant at 1,109.6 feet. Figure 12 shows instantaneous gauge height.

Total dissolved gas saturation ranged from 99 to 104% during the reporting period (mean: 100.7%). Figure 113 shows total dissolved gas saturation.

Stream temperatures were recorded every 2 hours for the length of the report period at the RST (Figure 114). Temperature probes operated normally throughout this reporting period.

Flows through the Powerhouse and Spill during the reporting period averaged 1,581.6 and 0 cubic feet per second (cfs), respectively (Figure 15). Catch per unit of effort (CPUE) data are summarized in Table 7. Discharge and capture data for the duration of monitoring efforts at this location are provided in Appendix B.

Table 7. Summary of salmonid CPUE, Big Cliff Dam.

Description	Chinook (8 ft)	Winter Steelhead (8 ft)
Catch	30	2
Effort (hrs)	361.03	361.03
CPUE (fish/hr)	0.083	0.006

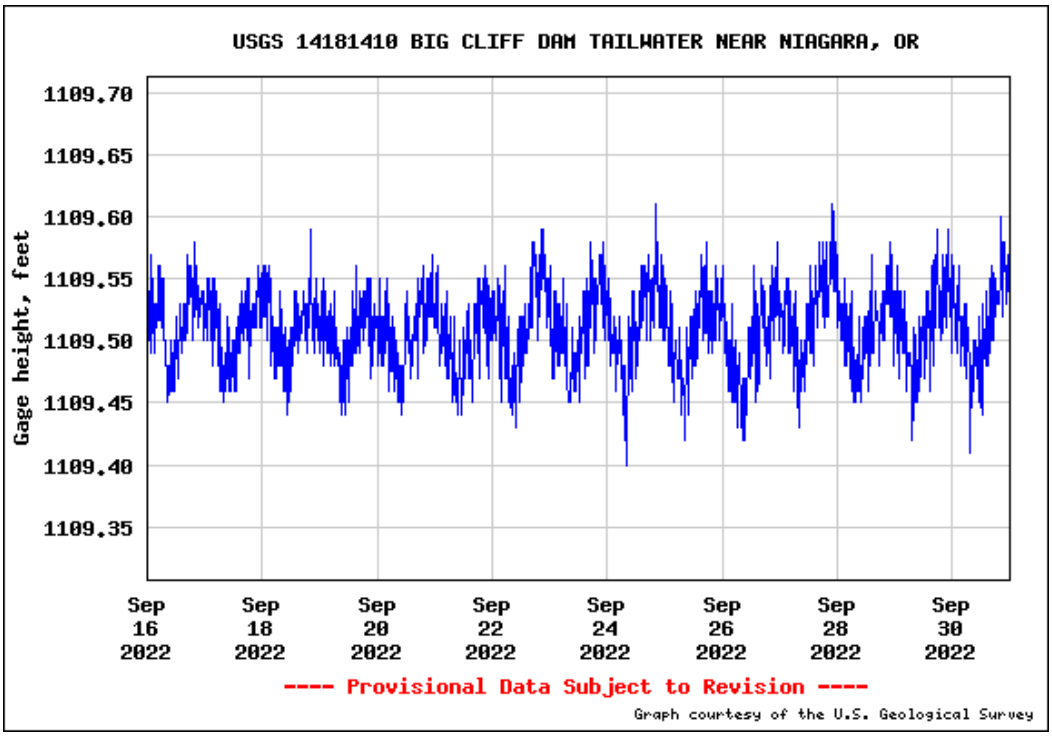


Figure 12. Gauge height (ft); below Big Cliff Dam

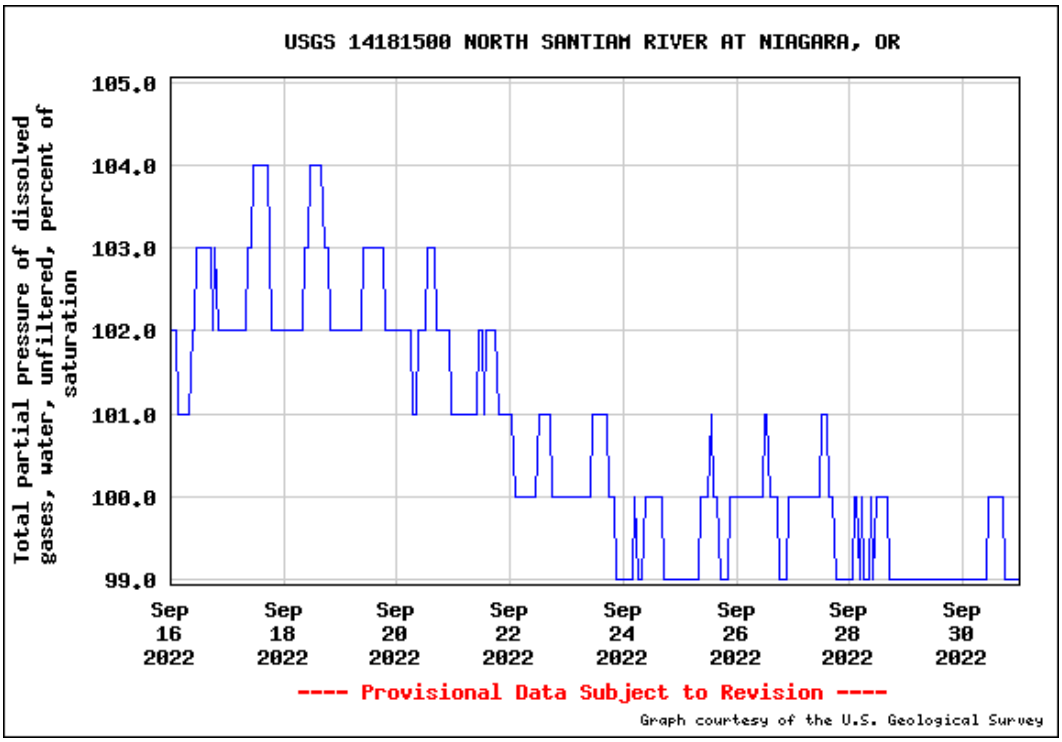


Figure 13. Total Dissolved Gas Saturation (%); below Big Cliff Dam

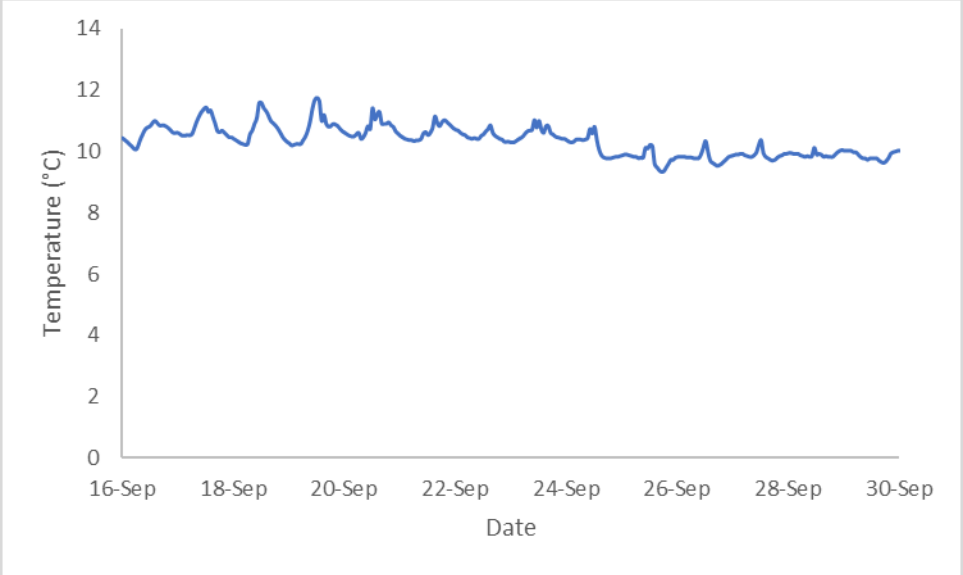


Figure 14. Temperature at RST (Big Cliff Dam)

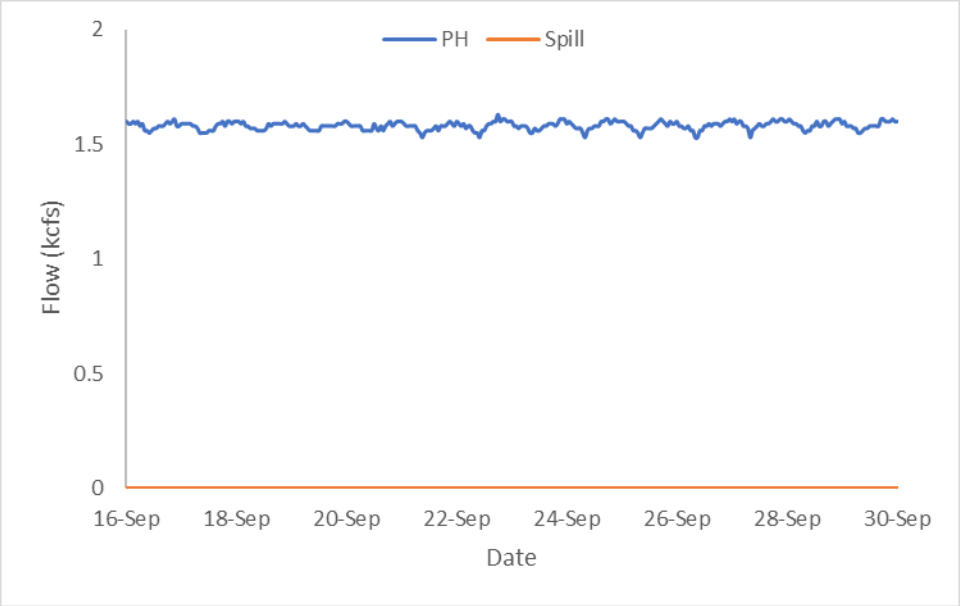


Figure 15. Hourly Flows PWR vs. Spill (Big Cliff Dam)

South Fork Santiam– Foster Dam Head of Reservoir

Target Species

This reporting period began on September 16 and ended on September 30. There were 0 Chinook salmon (CHS) and 0 Winter Steelhead (STW) captured during the 15-day sampling period. Sampling duration was 100% for the RST. Table 8 provides life stage, length, and weight data for all Chinook Salmon and Winter Steelhead that have been caught at the Foster Dam Head of Reservoir- South Santiam site to-date and for the reporting period. Figure 16 shows the daily capture numbers for Chinook and Winter Steelhead and Figure 17 shows length frequency data to-date for both species.

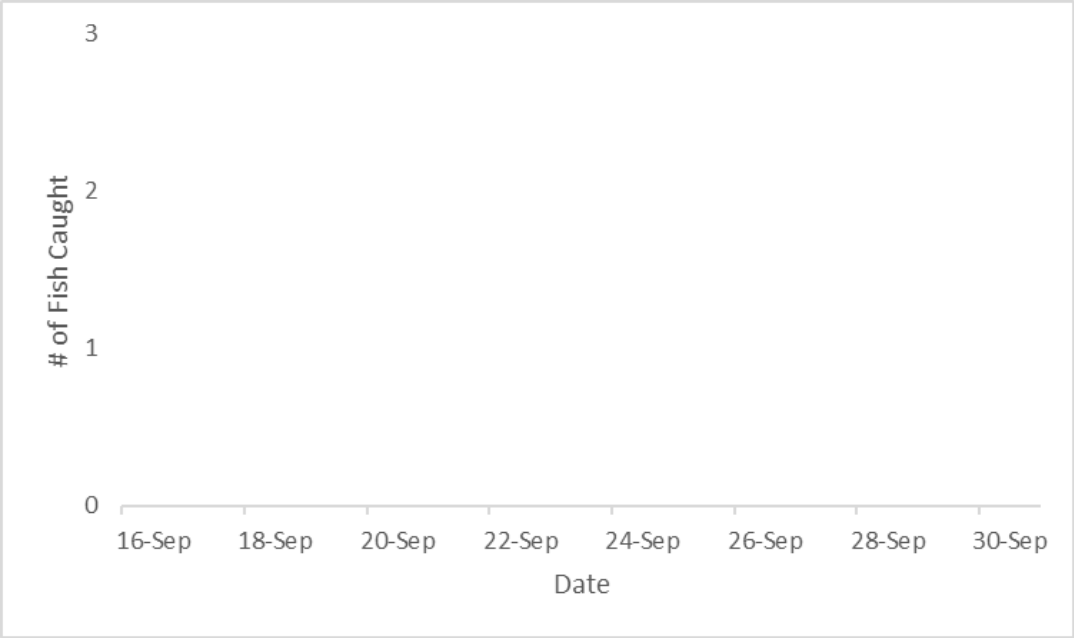


Figure 16. Chinook and Winter Steelhead Captured Per Day 09/16/2022 to 09/30/2022 (Foster Dam Head of Reservoir- South Santiam)

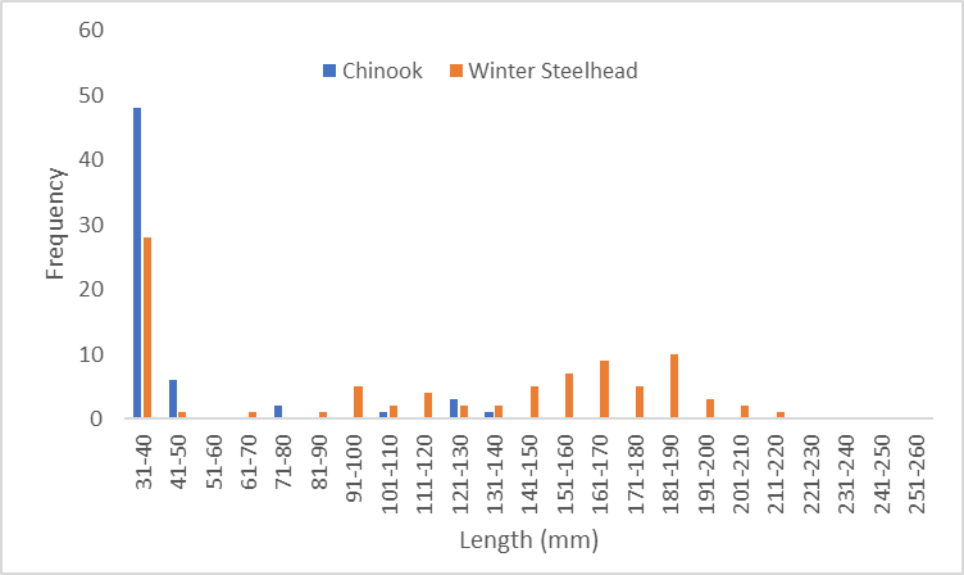


Figure 17. Length Frequency of Juvenile Chinook and Winter Steelhead Sampled Season To-Date (Foster Dam Head of Reservoir- South Santiam)

Trapping Efficiency

15 Chinook and 60 Winter Steelhead have been caudal clipped and released upstream for the purpose of conducting run of river trapping efficiency trials. To date, one of the released Winter Steelhead has been recaptured. Currently, trapping efficiency for Winter Steelhead is 1.3%. Only fish large enough to be safely caudal clipped have been used for run of river efficiency trials.

A total of 1063 juvenile hatchery Chinook (sub-yearlings) were bismarck brown dyed, adipose clipped and released on 9/29/2022 below Big Cliff Dam. No fish have been recaptured to date.

Foster Dam Head of Reservoir- South Santiam	Release #	Recapture #	Capture Efficiency
8ft Trap	1063	0	0% (0/1063)

Table 8. Descriptive Statistics of Target Species Captured at the Foster Dam Head of Reservoir- South Santiam Site Season To-Date

To-Date (Since March 16, 2022)										
Site	Trap	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Foster Dam Head of Reservoir- South Santiam	5 ft	CHS	Fry	55	32	49	35.9	N/A	N/A	N/A
		CHS	Parr	8	70	127	85	3.1	24.7	8.0
		CHS	Smolt	3	120	138	129	19.6	27.5	23.5
		STW	Fry	31	28	46	34.6	N/A	N/A	N/A
		STW	Parr	17	65	183	116.7	2.4	63.6	20.9
		STW	Smolt	42	112	213	168.7	11.2	75.3	47.4
September 16-30, 2022										
Site	Trap	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Foster Dam Head of Reservoir- South Santiam	5 ft	CHS	Fry	0	N/A	N/A	N/A	N/A	N/A	N/A
		CHS	Parr	0	N/A	N/A	N/A	N/A	N/A	N/A
		CHS	Smolt	0	N/A	N/A	N/A	N/A	N/A	N/A
		STW	Fry	0	N/A	N/A	N/A	N/A	N/A	N/A
		STW	Parr	0	N/A	N/A	N/A	N/A	N/A	N/A
		STW	Smolt	0	N/A	N/A	N/A	N/A	N/A	N/A

*Most fry are too small to collect accurate weight measurements in the field.

Injuries and Copepod Infection

Partial descaling <20% was observed on 0 of the 0 Spring Chinook captured (0.0%). Body injuries were present on 0 Spring Chinook (0.0%) and 0 displayed eye injury (0.0%). No copepods were present on any of the Spring Chinook captured (0.0%). There were no mortalities.

Partial descaling <20% was observed on 0 of the 0 Winter Steelhead captured (0.0%). Body injuries were present on 0 Winter Steelhead (0.0%) and 0 displayed eye injury (0.0%). No copepods were present on any of the Winter Steelhead captured (0.0%). There were no mortalities. A summary of injuries observed

during the reporting period are provided in Table 9, and for the duration of the season are provided in Appendix A.

Table 9. Number of Descaled, Bodily/Eye Injured, Copepod Infected and Dead Chinook Salmon and Winter Steelhead for Sampling Period. (Foster Dam Head of Reservoir- South Santiam).

Site	Species	# Fish Collected	# DSC* <20%	# DSC* >20%	# with Body Injuries	# with Eye Injuries	# with COP* In B.C.	# with COP* on Fins	Mortalities
Foster Dam Head of Reservoir- South Santiam	Chinook	0	0	0	0	0	0	0	0
	Winter Steelhead	0	0	0	0	0	0	0	0

Collected DNA and Scale Samples

For the reporting period, scales and DNA were collected from 0 Spring Chinook and 0 Winter Steelhead. The other targets captured did not meet length criteria for DNA sampling.

Non-Target Species

11 non-target species fish were captured during the reporting period; the data is summarized below in Table 10.

Table 10. Summary of Non-target Species (Foster Dam Head of Reservoir).

Species	5 ft Capture	5 ft Mortality	Season Total	Season Total Mortality
Dace	11	0	42	1
Sculpin	0	0	2	1
Largescale Sucker	0	0	3	0
Cutthroat	0	0	28	0
Unknown	0	0	4	0
Totals	**11**	**0**	**79**	**2**

Stream Statistics

Basic stream statistics at the Foster Dam Head of Reservoir- South Santiam site were calculated from data downloaded from the U.S. Geological Survey stream gauge number 14185000. Discharge (cfs) and Gauge height (feet) are available at this gauge. During the reporting period, daily maximum values for instantaneous discharge ranged from 42.1 cfs to 64.5 cfs (mean: 50.9 cfs). Figure 18 shows instantaneous discharge.

Stream temperatures were recorded every 2 hours for the length of the report period for the RST (Figure 19). Temperature probes for the trap operated normally throughout this reporting period.
Catch per unit of effort (CPUE) data are summarized in Table 11. Discharge and capture data for the duration of monitoring efforts at this location are provided in Appendix B.

Table 11. Summary of salmonid CPUE, Foster Dam Head of Reservoir- South Santiam.

	Chinook	Winter Steelhead
Description	**(5 ft)**	
Catch	0	0
Effort (hrs)	361.2	361.2
CPUE (fish/hr)	0	0

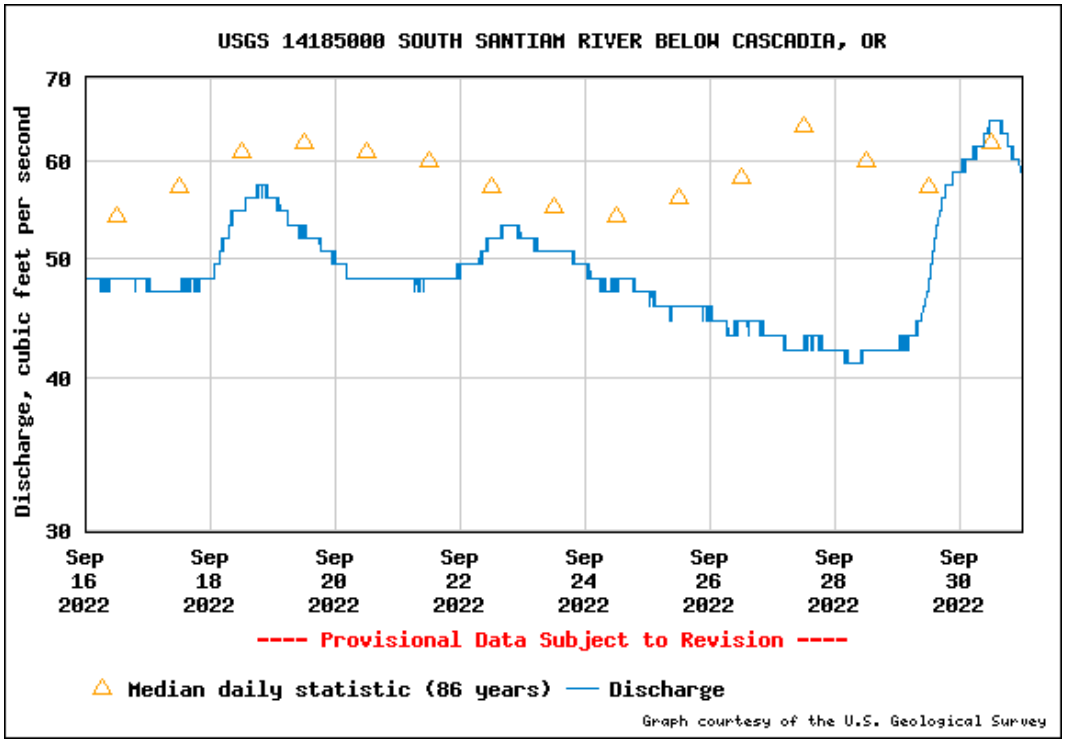


Figure 18. Discharge (cfs); Foster Dam Head of Reservoir – S. Santiam)

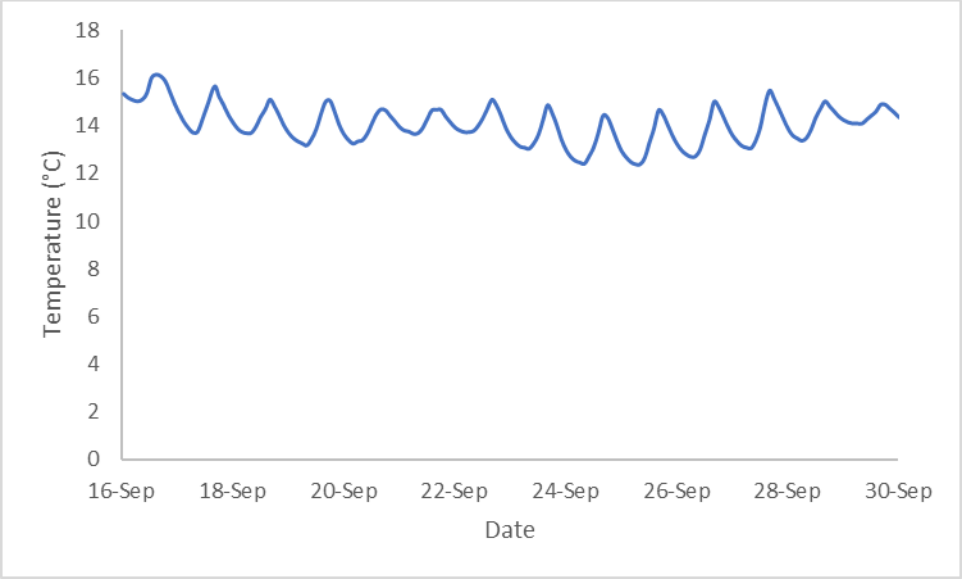
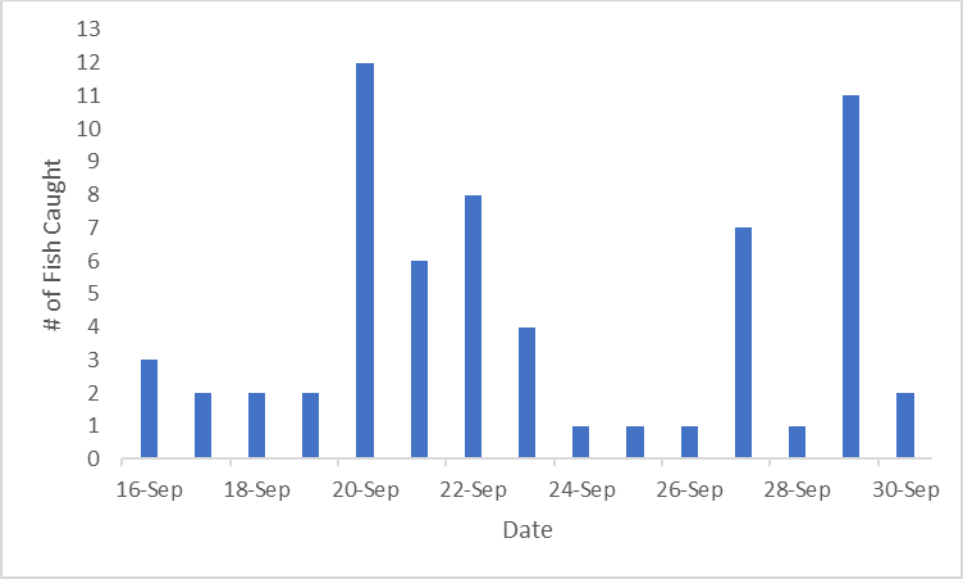


Figure 19. Temperature at RST (Foster Dam Head of Reservoir – S. Santiam)

South Fork McKenzie – Cougar Dam

Target Species

This reporting period began on September 16 and ended on September 30. There were a total of 63 Chinook Salmon (CHS) captured during the 15-day sampling period. Sampling duration was 100% for the RO RST and 100% for the Powerhouse RSTs. Table 12 provides life stage, length, and weight data for all Chinook salmon that have been caught at the Cougar Dam site to-date and for the reporting period. Figure 20 shows the daily capture numbers for chinook and Figure 21 shows length frequency data to-date.



*Recaptured fish for trapping efficiency trials not included.

Figure 20. Chinook Captured Per Day 09/16/2022 to 09/30/2022 (Cougar Dam)

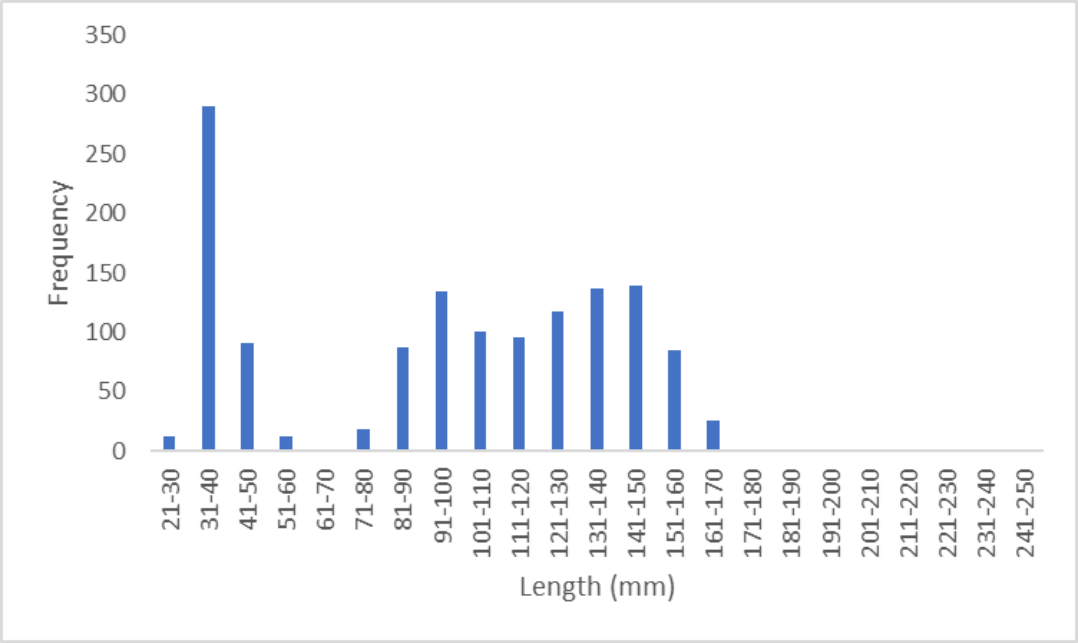


*Figure does not include fish without heads or fish used for trapping efficiency trials.

Figure 21. Length Frequency of Juvenile Chinook Sampled Season To-Date (Cougar Dam)

Trapping Efficiency

A total of 501 juvenile hatchery Chinook (sub-yearlings) were bismarck brown dyed, adipose clipped, left vent clipped and released on 8/11/2022. 31 fish were recaptured for an efficiency of 6.2%. Trapping efficiency fish displayed injuries, primarily descaling and fin damage.

Cougar Dam	Release #	Recapture #	Capture Efficiency
PH Route	501	31	6.2% (31/501)

.

Table 12. Descriptive Statistics of Target Species Captured at the Cougar Dam Season To-Date

To-Date (Since Dec. 01, 2021)										
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Cougar Dam	RO	CHS	Fry	21	34	48	40.8	N/A	N/A	N/A
		CHS	Parr	135	56	164	108.5	1.2	41.1	14.8
		CHS	Smolt	225	92	230	139.2	8.8	86.1	29.1
Cougar Dam	PWR	CHS	Fry	382	25	55	38.0	1.0	1.8	1.2
		CHS	Parr	265	54	165	99.1	1.6	41.0	10.7
		CHS	Smolt	331	76	223	133.5	4.2	113.5	26.3

*Fish that were missing heads are not included in length and weight calculations.

September 16-30, 2022										
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Cougar Dam	RO	CHS	Fry	0	N/A	N/A	N/A	N/A	N/A	N/A
		CHS	Parr	0	N/A	N/A	N/A	N/A	N/A	N/A
		CHS	Smolt	0	N/A	N/A	N/A	N/A	N/A	N/A
Cougar Dam	PWR	CHS	Fry	0	N/A	N/A	N/A	N/A	N/A	N/A
		CHS	Parr	2	84	89	86.5	5.7	8.3	7.0
		CHS	Smolt	61	116	223	141.9	17.6	113.5	32.7

*Fish that were missing heads are not included in length and weight calculations.

24-Hour Post Collection Holding Trial

A total of 55 Chinook captured in the RSTs, 55 fish from the PWR RST and 0 from the RO RST, were held for ~24 hours in holding tanks and then evaluated for survival rates. In total, 3 of the fish (5.5%) held during this period died during holding. 2 of the 55 PWR RST captured fish (5.5%) died during holding and 0 of the 0 RO RST captured fish (0.0%) died during holding.

Injuries and Copepod Infection

Partial descaling <20% was observed on 0 of the 0 Chinook collected at the RO RST (0.0%). Descaling >20% was observed on 0 of the Chinook (0.0%). There were 0 fish with bodily injuries (0.0%) and 0 had eye injuries (0.0%). 0 fish had copepods present in the branchial cavity (0.0%) and 0 had copepods present on fins (0.0%). No fish displayed Gas Bubble Disease (0.0%). There were 0 chinook mortalities collected in the RO RST (0.0%).

Partial descaling <20% was observed on 51 of the 63 Chinook collected at the PWR RST (81.0%). Descaling >20% was observed on 6 of the Chinook (9.5%). There were 34 fish with bodily injuries (54.0%) and 0 had eye injuries (0.0%). 62 fish had copepods present in the branchial cavity (98.4%) and 39 had copepods present on fins (61.9%). 0 fish displayed Gas Bubble Disease (0.0%). There were 8 chinook mortalities collected in the PWR RST (12.7%). Data is summarized below in Table 13. A summary of injuries observed during the reporting period, and for the duration of the season are provided in Appendix A.

Table 13. Number of Descaled, Bodily/Eye Injured, Copepod Infected and Dead Chinook Salmon for Sampling Period. (Cougar Dam).

Site	Route	# CHS Collected	# DSC* <20%	# DSC* >20%	# with Body Injuries	# with Eye Injuries	# with COP* In B.C.	# with COP* on Fins	Mortalities
Cougar	RO	0	0	0	0	0	0	0	0
Cougar	PWR	63	51	6	34	0	62	39	8

*DSC=Descaled, COP=Copepods, B.C.=Branchial Cavity

Non-Target Species

A total of 52 non-target species fish were captured during the reporting period; the data is summarized below in Table 14. Adipose clipped Chinook captured were from previous TE releases. They are not ODFW PIT tagged fish.

Table 14. Summary of Non-target Species (Cougar Dam).

Species	RO Capture	RO Mortality	PWR Capture	PWR Mortality	Season Total Capture	Season Total Mortality
Brook Lamprey	0	0	0	0	3	0
Bluegill	0	0	1	0	1	0
Bull Trout	0	0	0	0	1	0
Chinook (AD clipped)	0	0	1	0	3	0
Chinook (Adult)	0	0	1	0	1	0
Cutthroat	0	0	0	0	71	3
Dace	0	0	42	0	2490	8
Largescale Sucker	0	0	0	0	54	0
Mountain Whitefish	0	0	0	0	45	0
Northern Pikeminnow	0	0	0	0	2	0
O. mykiss	0	0	0	0	301	3
Sculpin	0	0	6	0	206	4
Smallmouth Bass	0	0	0	0	2	0
Spotted Bass	0	0	0	0	2	0
Unknown	0	0	1	1	21	2
Totals	**0**	**0**	**52**	**1**	**3251**	**20**

Stream Statistics

Basic stream statistics at the Cougar Dam site were calculated from data downloaded from U.S. Geological Survey stream gauge numbers 14159410 and 14181500. Gauge height (feet) is the only metric provided at gauge 14159410. Total dissolved gas saturation data was received from gauge 14181500, 500 meters downstream of the trap. During the reporting period, daily maximum values for instantaneous gauge height remained constant at 1,253.4 feet. Figure 22 shows instantaneous gauge height.

Total dissolved gas saturation ranged from 100 to 103% (mean: 101.2%). Figure 23 shows total dissolved gas saturation.

Stream temperatures were recorded every 2 hours for the length of the report period for the RO and PWR RST's (Figure 24 and 25 respectively). Temperature probes for the RO and PWR RST operated normally throughout this reporting period.

Flows through the Powerhouse and RO during the reporting period averaged 688.4 and 0 cubic feet per second (cfs) respectively (Figure 26). Catch per unit of effort (CPUE) data are summarized in Table 15. Discharge and capture data for the duration of monitoring efforts at this location are provided in Appendix B.

Table 15. Summary of salmonid CPUE, Cougar Dam.

	Chinook	
Description	RO (5ft)	PWR (8ft)
Catch	0	63
Effort (hrs)	360.33	718.25
CPUE (fish/hr)	0	0.08

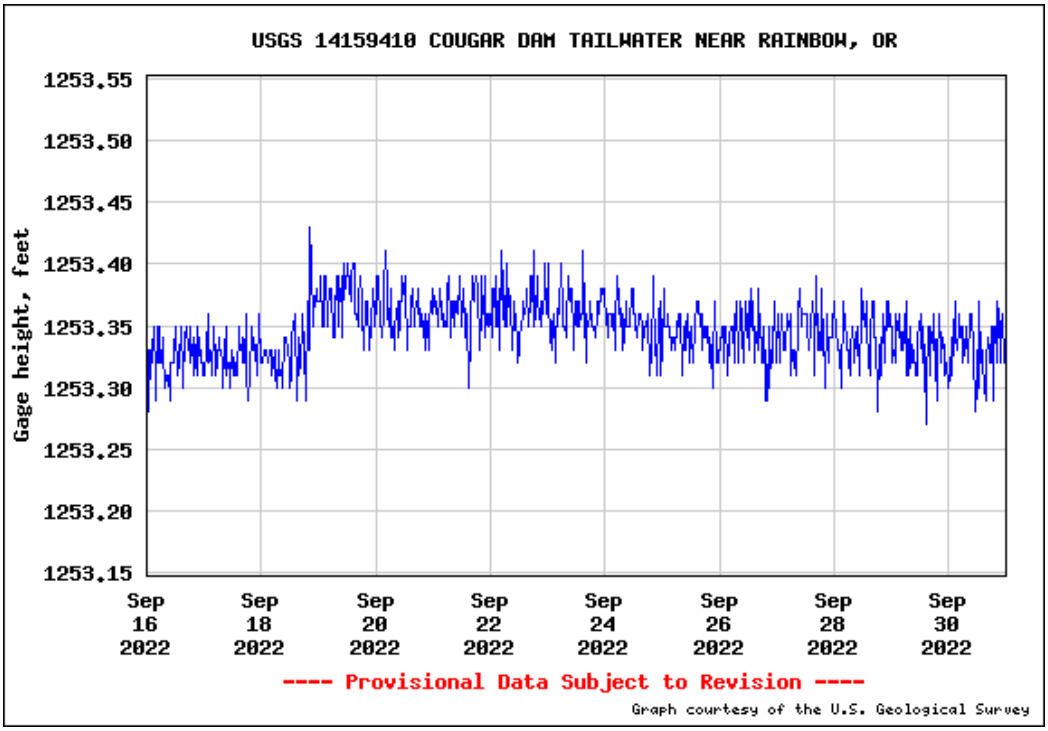


Figure 22. Gauge Height (feet); below Cougar Dam, South Fork McKenzie River

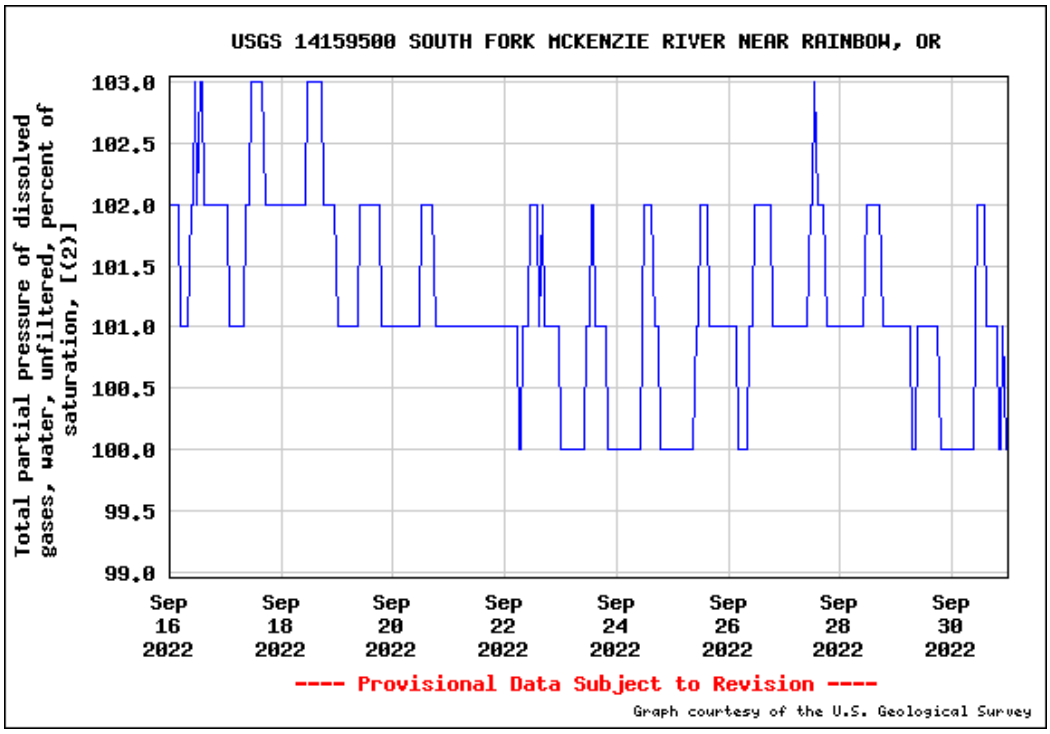


Figure 23. Total Dissolved Gas Saturation (%); below Cougar Dam, South Fork McKenzie River

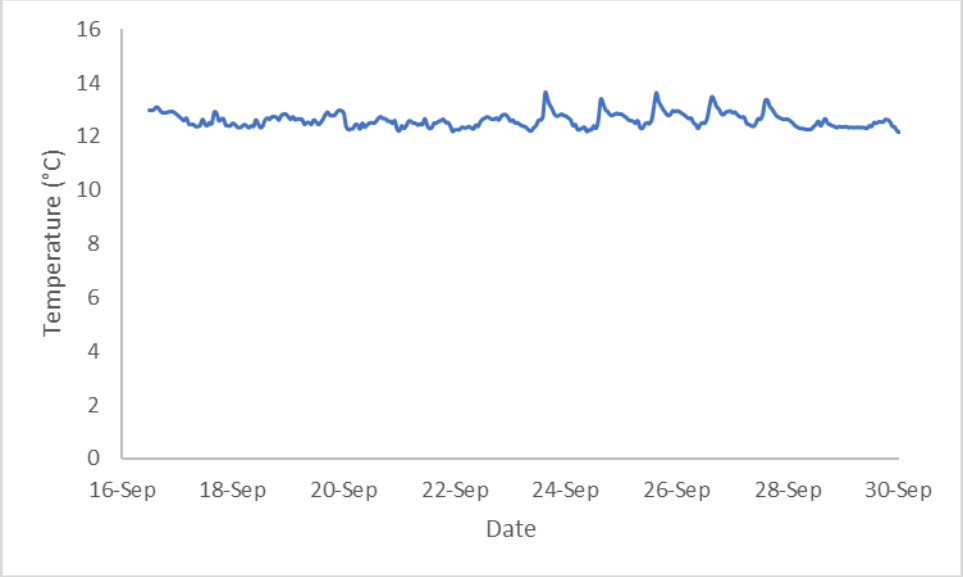


Figure 24. Temperature at RO RST (Cougar Dam)

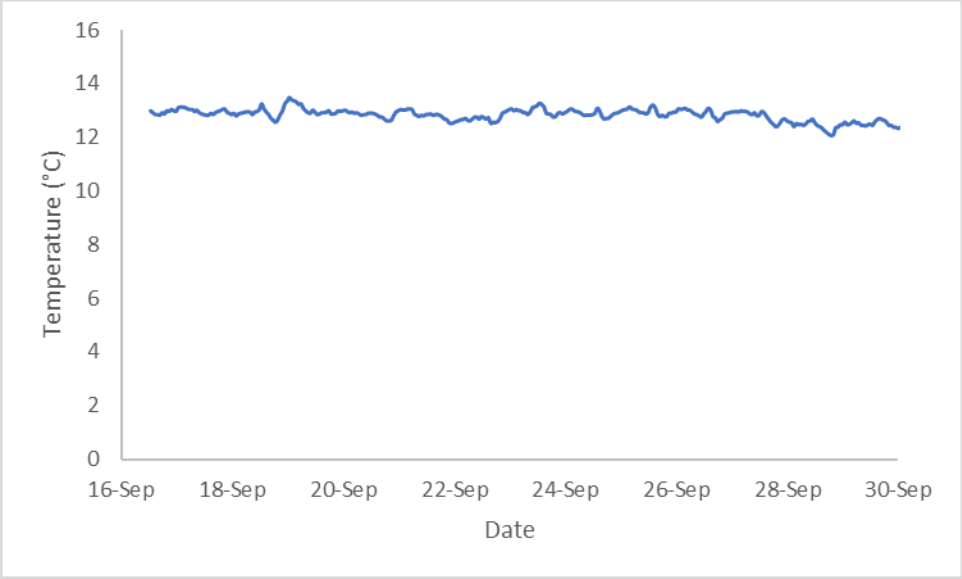


Figure 25. Temperature at PWR RST (Cougar Dam)

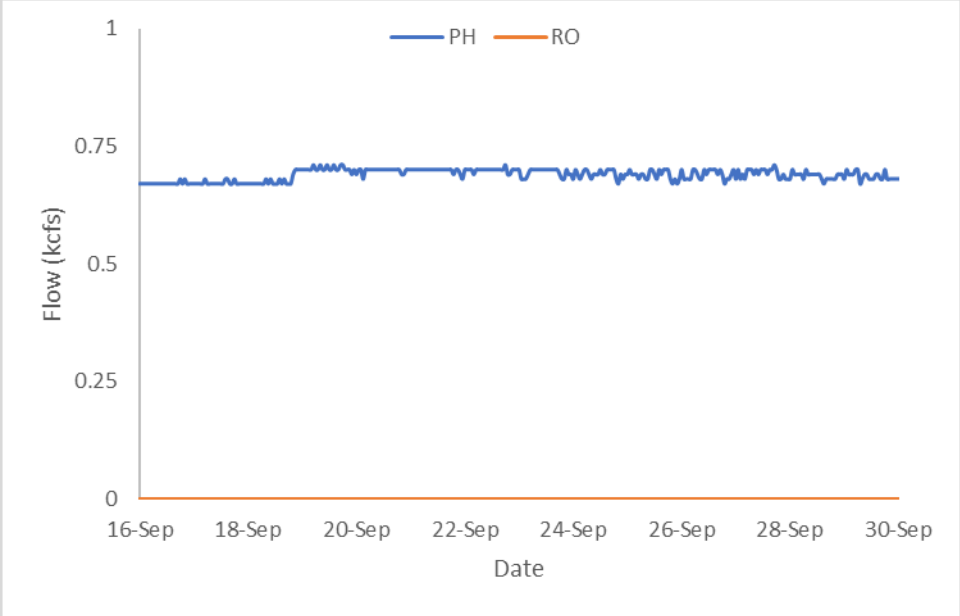


Figure 26. Hourly Flows PWR vs. RO (Cougar Dam)

South Fork of the McKenzie–Cougar Dam Head of Reservoir

Target Species

The reporting period began September 16 and ended on September 30. There were 43 Chinook salmon captured during the 15-day sampling period (Figure 27). The trap was operated 100% of the reporting period. Table 16 provides life stage, length, and weight data for all Chinook salmon that have been caught at the site to-date and Figure 28 shows length frequency data to-date.

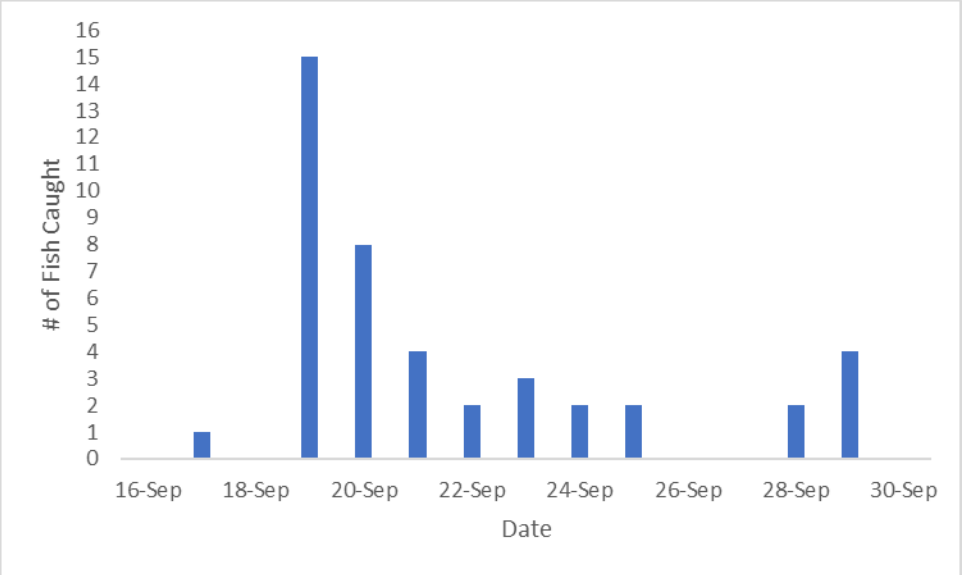


Figure 27. Chinook Captured Per Day 09/16/2022 to 09/30/2022 (Cougar Dam Head of Reservoir)

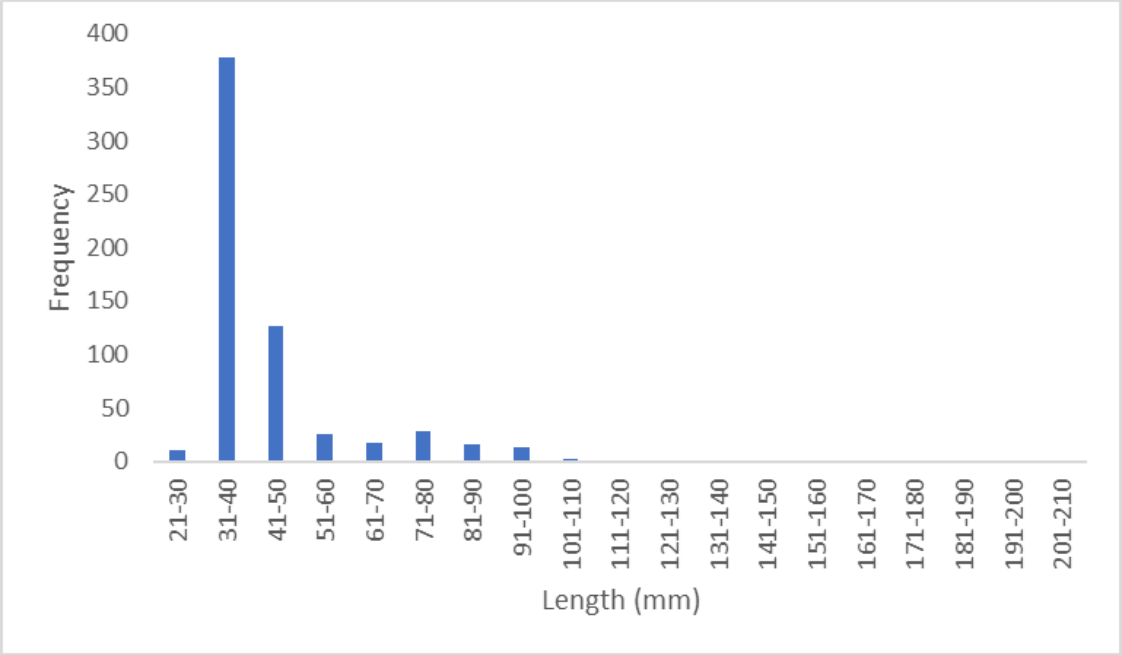


Figure 28. Length Frequency of Juvenile Chinook Sampled Season To-Date (Cougar Dam Head of Reservoir)

Table 16. Descriptive Statistics of Target Species Captured at Cougar Dam Head of Reservoir, Season To-Date and for the Reporting Period

To-Date (Since March 07, 2022)										
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Cougar Dam Head of Reservoir	5 ft	CHS	Smolt	4	70	94	82	3.3	9.4	6.2
		CHS	Parr	87	43	150	77.2	1.0	11.2	5.2
		CHS	Fry	528	27	63	38.6	0.6	2.8	1.4

September 16-30, 2022										
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Cougar Dam Head of Reservoir	5 ft	CHS	Smolt	4	70	94	82	3.3	9.4	6.2
		CHS	Parr	39	60	85	72.9	2.3	8.1	4.4
		CHS	Fry	0	N/A	N/A	N/A	N/A	N/A	N/A

***Most fry are too small to collect accurate weights and thus some metrics are not available for them.**

Trapping Efficiency

A total of 551 juvenile hatchery Chinook (smolt) were adipose clipped, PIT tagged, and released on 9/22/2022 upstream of the Cougar Head of Reservoir trap site. A total of 56 fish were recaptured in the 5 ft trap. Trapping efficiency was 10.2%. Of the 56 fish recaptured, 30 displayed minor descaling and 25 had fin damage.

Cougar Dam Head of Reservoir	Release #	Recapture #	Capture Efficiency
5ft trap	551	56	10.2% (56/551)

Injuries and Copepod Infection

43 Chinook were captured for the reporting period. Of the fish captured, partial descaling <20% was observed on 23 fish (53.5%), 0 had copepods in the branchial cavity (0.0%), 2 had copepods on fins (4.7%), and 13 had bodily injury (30.2%). There were 0 mortalities for this reporting period (0.0%). Injury data for the reporting period is summarized in Table 17. To date injury data can be found in Appendix A.

Table 17. Number of Descaled, Bodily/Eye Injured, Copepod Infected and Dead Chinook Salmon for Sampling Period. (Cougar Dam Head of Reservoir)

Site	# CHS Collected	# DSC* <20%	# DSC* >20%	# with Body Injuries	# with Eye Injuries	# with COP* In B.C.	# with COP* on Fins	Mortalities
Cougar Dam Head of Reservoir	43	23	0	13	0	0	2	0

*DSC=Descaled, COP=Copepods, B.C.=Branchial Cavity

Collected DNA and Scale Samples

Scales and DNA were collected from 41 of the Chinook captured. The rest of the captured fish were under the minimum fork length threshold and samples were not collected (less than 45 mm fork length for DNA and less than 50 mm fork length for scales).

VIE Marking

Visual Implant Elastomer (VIE) trials commenced at the Cougar Dam Head of Reservoir site on 6/25/2022. VIE tag color and locations are changed every reporting period to distinctly mark groups of fish by capture date. Since then, 30 Chinook have been VIE marked to the left of their dorsal fin with fluorescent yellow elastomer. 1 Chinook was marked this period to the left of the dorsal fin with fluorescent orange elastomer. No fish with VIE marks have been detected at downstream RST sites to date.

Date Tagged	VIE Color	# Tagged	# Recaptured to Date
6/25/2022-7/15/2022	Yellow	30	0
9/15/2022-9/30/2022	Orange	1	0

Non-Target Species

A total of 18 non-target fish were captured at the Cougar Dam Head of Reservoir RST during the reporting period; the data is summarized below in Table 18.

Table 18. Summary of Non-target Species (Cougar Dam Head of Reservoir)

Species	5ft Capture	5ft Mortality	Season Total	Season Total Mortality
Bull Trout	0	0	2	0
Cutthroat Trout	0	0	41	1
Dace	1	0	8	0
Sculpin	0	0	3	1
O. mykiss	15	0	332	3
Whitefish	2	0	2	0
Unknown	0	0	9	0
Totals	18	**0**	**397**	**5**

Stream Statistics

Basic stream statistics at the site were calculated from data downloaded from the U.S. Geological Survey stream gauge number 14159200. During the reporting period, daily maximum values for instantaneous discharge ranged from 211.0 cfs to 239.0 cfs (mean: 221.6 cfs). Figure 29 shows instantaneous discharge.

Stream temperatures were recorded every two hours using a temperature probe at the Cougar Dam Head of Reservoir RST site during this reporting period. Temperature probes operated normally, and the data is shown below in Figure 30.

Catch per unit of effort (CPUE) data are summarized in Table 19. Discharge and capture data for the duration of monitoring efforts at this location are provided in Appendix B.

Table 19. Summary of Chinook CPUE, Cougar Dam Head of Reservoir

	Chinook
Description	**5 ft**
Catch	43
Effort (hrs)	327.63
CPUE (fish/hr)	0.131

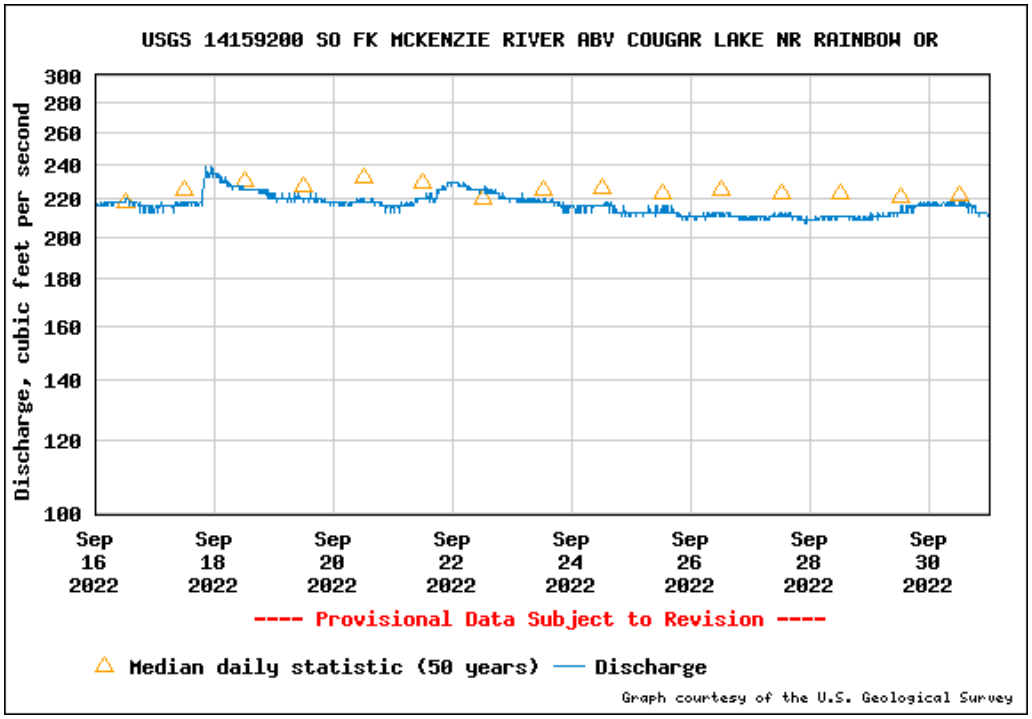


Figure 29. Discharge (cfs); South Fork McKenzie above Cougar Dam

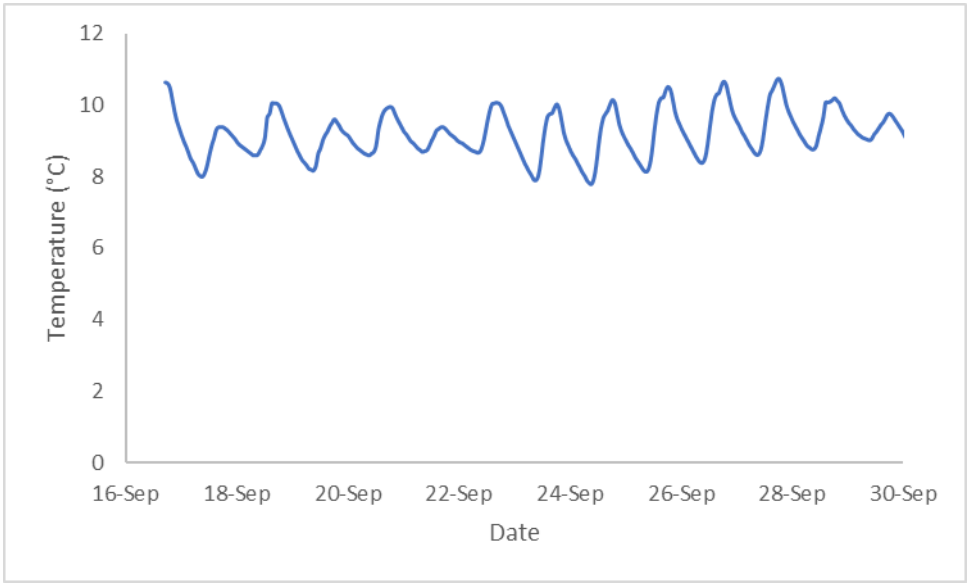
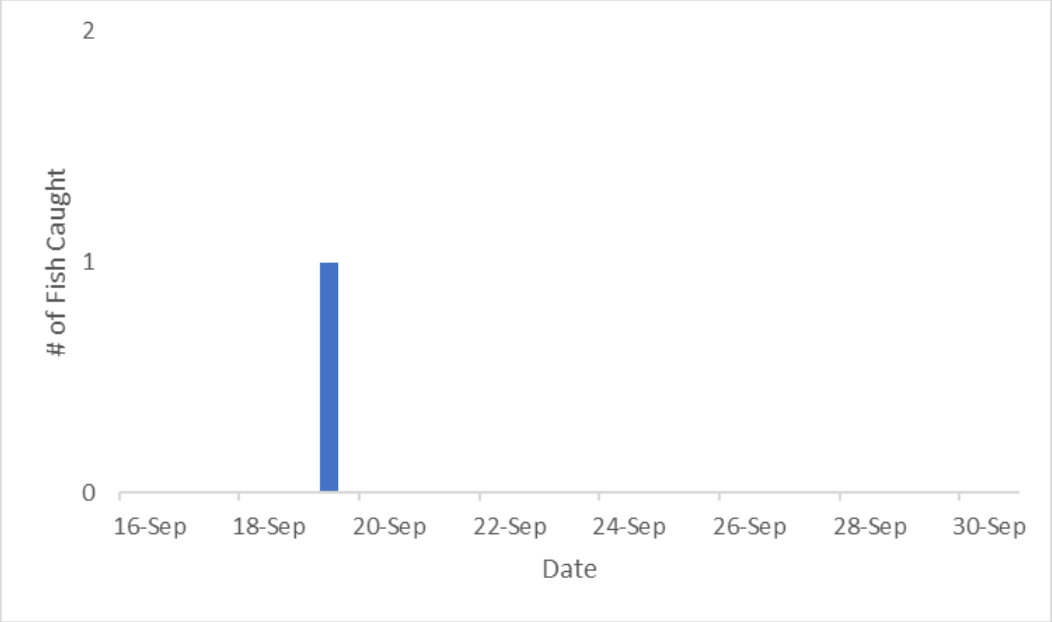


Figure 30. Temperature Near RST (Cougar Dam Head of Reservoir)

Middle Fork Willamette– Dexter Dam

Target Species

This reporting period began on September 16 and ended on September 30. There was 1 Chinook salmon (CHS) captured during the 15-day sampling period. The Dexter Dam trap was raised to a non-sampling position on September 24th due to hazardous air quality from the Cedar Creek Fire. It was lowered to a sampling position again on September 25th. Sampling duration was 93.3% for the 5 ft RST. Table 20 provides life stage, length, and weight data for all Chinook salmon that have been caught at the Dexter Dam site to-date and for the reporting period. Figure 31 shows the daily capture numbers for Chinook and Figure 32 shows length frequency data to-date.



*Recaptured fish for trapping efficiency trials not included.

Figure 31. Chinook Captured Per Day 09/16/2022 to 09/30/2022 (Dexter Dam)

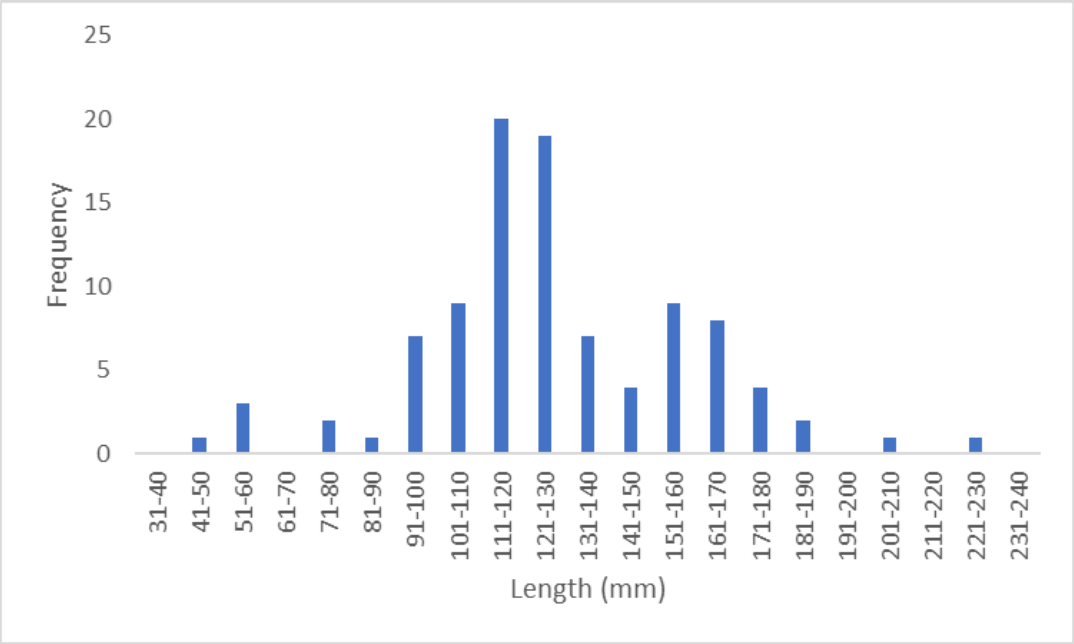


*Figure does not include fish without heads or fish used for trapping efficiency trials.

Figure 32. Length Frequency of Juvenile Chinook Sampled Season To-Date (Dexter Dam)

Table 20. Descriptive Statistics of Target Species Captured at the Dexter Dam RST Season To-Date

To-Date (Since March 07, 2022)											
Site	Trap	Species	Life stage	Collected	Length (mm)*			Weight (g)*			
					Min	Max	Mean	Min	Max	Mean	
Dexter Dam	5 ft	CHS	Fry	3	46	55	51.3	1.4	1.4	1.4	
		CHS	Parr	18	51	159	101.3	2.1	48.3	12.8	
		CHS	Smolt	77	95	224	137.2	9.3	118.4	27.6	

September 16-30, 2022											
Site	Trap	Species	Life stage	Collected	Length (mm)*			Weight (g)*			
					Min	Max	Mean	Min	Max	Mean	
Dexter Dam	5 ft	CHS	Fry	0	N/A	N/A	N/A	N/A	N/A	N/A	
		CHS	Parr	1	92	92	92	5.3	5.3	5.3	
		CHS	Smolt	0	N/A	N/A	N/A	N/A	N/A	N/A	

*Fish that were missing heads are not included in length and weight calculations.

Trapping Efficiency

A total of 981 juvenile hatchery Chinook (sub-yearlings) were bismarck brown dyed, adipose clipped, upper caudal clipped and released on 07/21/2022 below Dexter Dam. Fish were released in small groups into powerhouse flow to evaluate the traps efficiency capturing fish passing through the powerhouse. 1 fish was recaptured in the 5-foot RST for an efficiency of 0.1%.

Mt. Hood Environmental staff noted that fish appeared to be in good condition upon retrieval from the hatchery.

Dexter Dam	Release #	Recapture #	Capture Efficiency
Spill	N/A	N/A	N/A
Powerhouse	981	1	0.1% (1/981)

24-Hour Post Collection Holding Trial

The 1 Chinook captured was held for 24 hours. 0 fish died in holding (0.0%) during this reporting period.

Injuries and Copepod Infection

1 Chinook was captured during this reporting period. Partial descaling <20% was observed in 0 of the 1 Chinook captured (0.0%) and 0 displayed descaling >20% (0.0%). 0 displayed body injury (0.0%) and 0 Chinook had eye injury (0.0%). 0 Chinook had copepods present in the branchial cavity (0.0%) and 0 had copepods on fins (0.0%). 0 displayed gas bubble disease (0.0%). There were 0 mortalities this reporting period (0.0%). Injuries are displayed in Table 21. To date injury data can be found in Appendix A.

Table 21. Number of Descaled, Bodily/Eye Injured. Copepod Infected and dead Chinook Salmon for Sampling Period (Dexter Dam).

Site	Route	# CHS Collected	# DSC* <20%	# DSC* >20%	# with Body Injuries	# with Eye Injuries	# with COP* In B.C.	# with COP* on Fins	Mortalities
Dexter Dam	PWR	1	0	0	0	0	0	0	0

*DSC=Descaled, COP=Copepods, B.C.=Branchial Cavity

Non-Target Species

105 non-target species fish were captured during the reporting period; the data is summarized below in Table 22. Dexter Fish Facility releases adipose clipped Chinook near our trapping site. Adipose clipped Chinook caught in our trap are being counted as non-target fish to provide better clarity on data concerning run of river Chinook. A pre-spawning mortality Adult Chinook carcass was caught in the trap this reporting period.

Table 22. Summary of Non-target Species (Dexter Dam).

Species	Capture	Mortality	Season Total	Season Total Mortality
Bass	2	0	97	1
Bluegill	3	0	7	1
Chinook (clipped)	0	0	357	7
Chinook (adult)	1	1	2	2
Crappie	13	0	46	5
Cutthroat	0	0	3	0
Dace	0	0	31	6
O. mykiss	0	0	16	0
O. mykiss (clipped)	1	0	34	2
Pikeminnow	1	0	1	0
Red-Sided Shiner	0	0	3	0
Sculpin	74	0	411	14
Sucker	1	1	3	1
Unknown	9	4	10	4
Totals	**105**	**6**	**1021**	**37**

Stream Statistics

Basic stream statistics at the Dexter Dam site were calculated from data downloaded from the U.S. Geological Survey stream gauge numbers 14149510 and 14150000. Gauge height (feet) is the only metric provided at gauge 14149510. Total dissolved gas saturation data was received from gauge 14150000, 4.75 rkms downstream of the trap. During the reporting period, daily maximum values for instantaneous gauge height ranged from 637.6 feet to 637.7 feet (mean: 637.6 feet). Figure 33 shows instantaneous gauge height.

Total dissolved gas saturation ranged from 103 to 110% (mean: 105.4%) during the reporting period. Figure 34 shows total dissolved gas saturation.

Stream temperatures were recorded every two hours using a temperature probe at the Dexter Dam RST site during this reporting period. Temperature probes operated normally, and the data is shown below in Figure 35.

Flows through the Powerhouse and Spill during the reporting period averaged 1,582.6 and 0 cubic feet per second (cfs) respectively (Figure 36). Catch per unit of effort (CPUE) data are summarized in Table 23. Discharge and capture data for the duration of monitoring efforts at this location are provided in Appendix B.

Table 23. Summary of salmonid CPUE, Dexter Dam.

	Chinook
Description	**8 ft**
Catch	1
Effort (hrs)	332.93
CPUE (fish/hr)	0.003

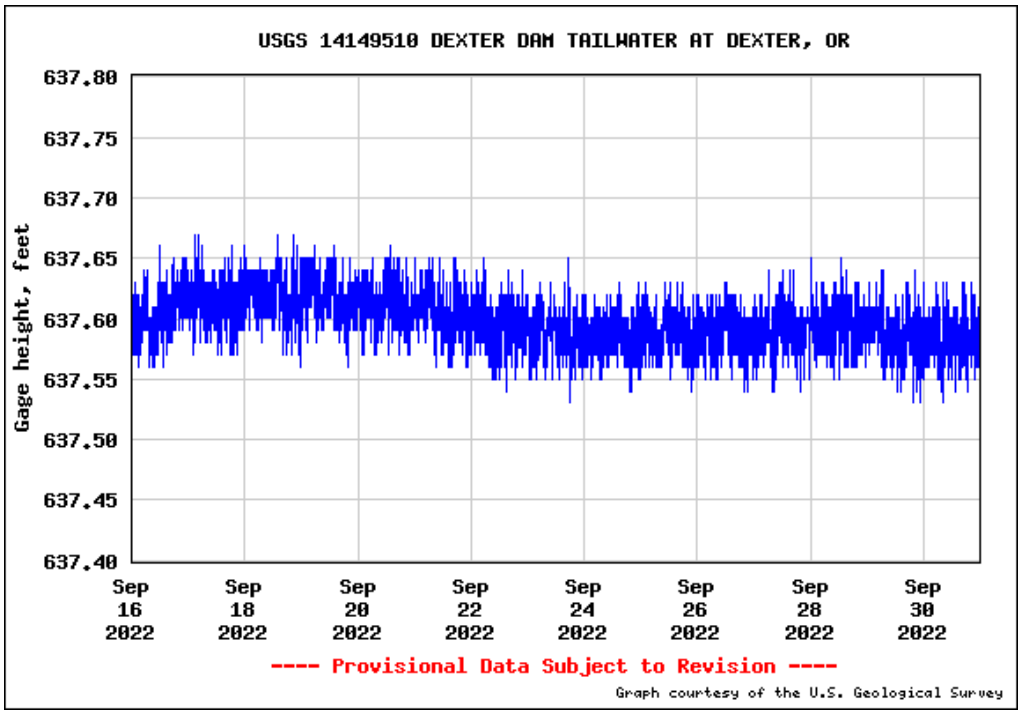


Figure 33. Gauge Height (feet); below Dexter Dam, Middle Fork Willamette

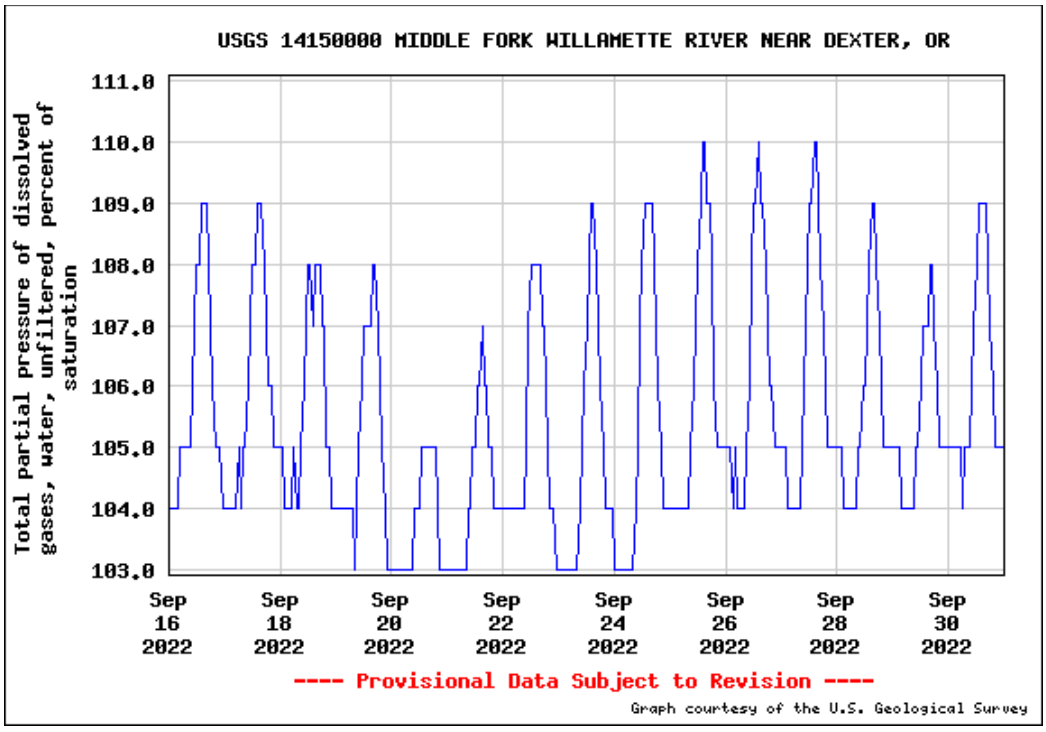


Figure 34. Total Dissolved Gas Saturation (%); Middle Fork Willamette River, Near Dexter, OR

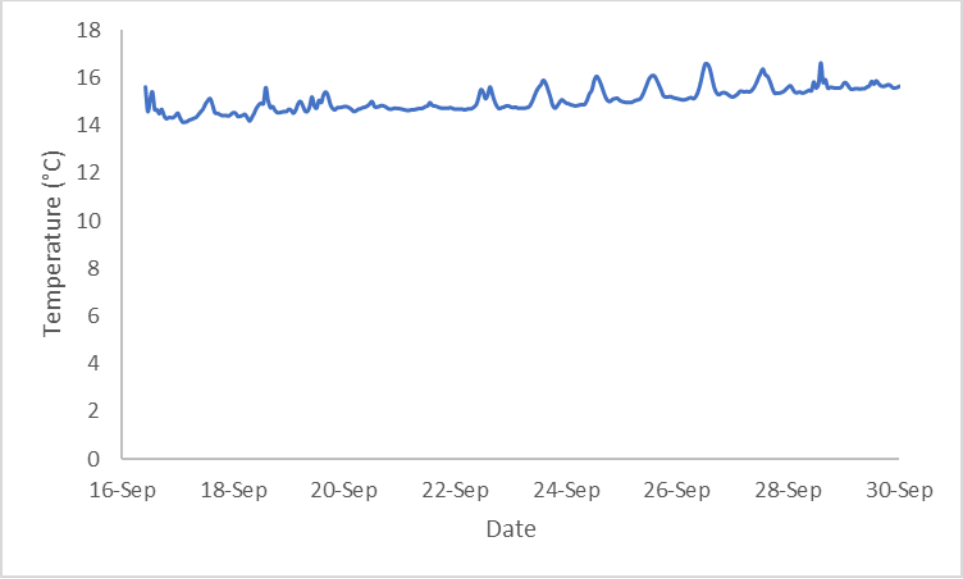


Figure 35. Temperature at RST (Dexter Dam)

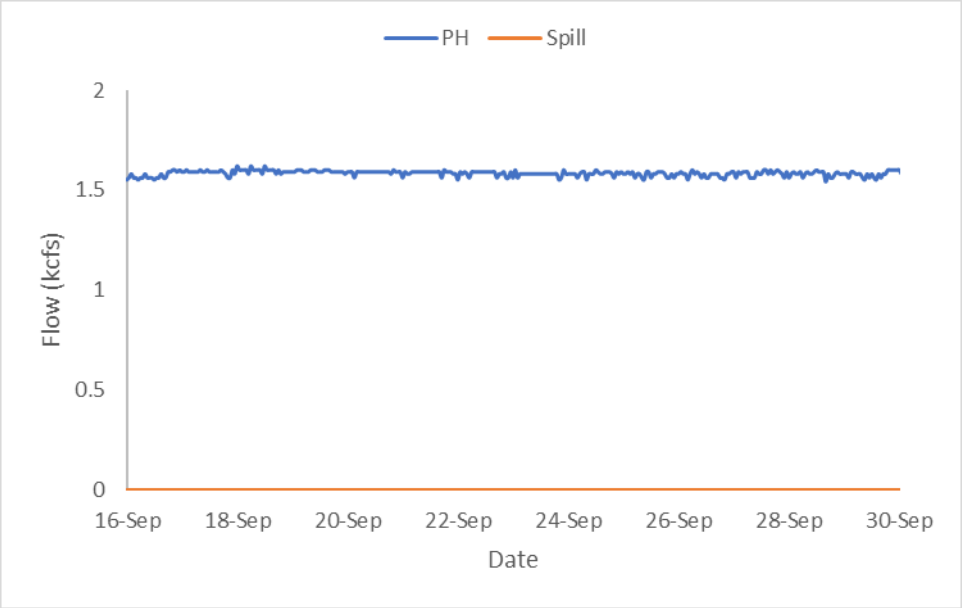


Figure 36. Hourly Flows PWR vs. Spill (Dexter Dam)

Middle Fork Willamette – Lookout Dam Tailrace

Target Species

The reporting period began September 16 and ended on September 30. 0 Chinook salmon were captured during the 15-day sampling period (Figure 37). The Lookout Dam Tailrace traps were raised to a non-sampling position on September 24th due to hazardous air quality from the Cedar Creek Fire. They were lowered to a sampling position again on September 25th. The traps were operated 93.3% of the reporting period. Table 24 provides life stage, length, and weight data for all Chinook salmon that have been caught at the Lookout Point Dam Tailrace site to-date and Figure 38 shows length frequency data to-date.

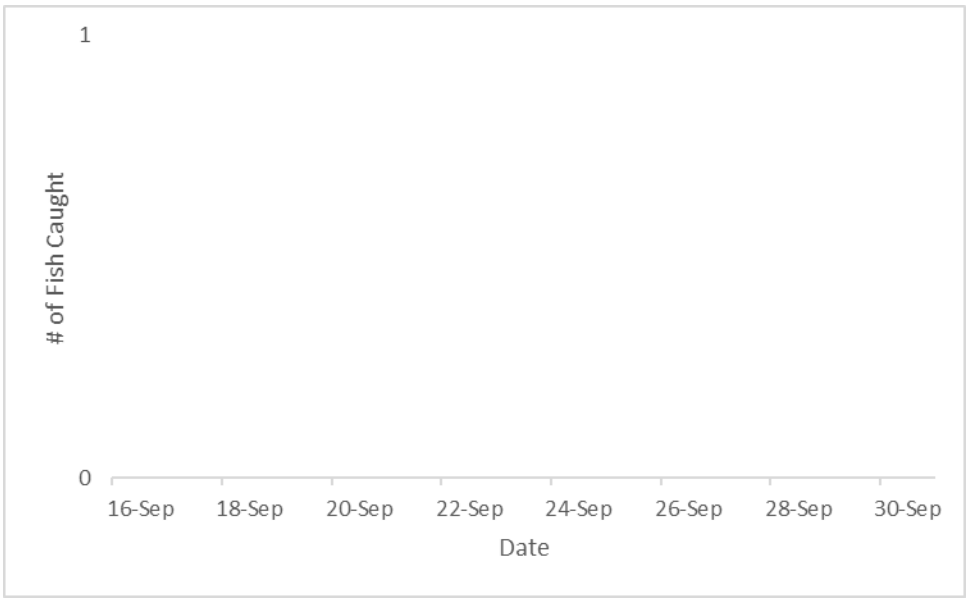


Figure 37. Chinook Captured Per Day 09/16/2022 to 09/30/2022 (Lookout Point Dam Tailrace)

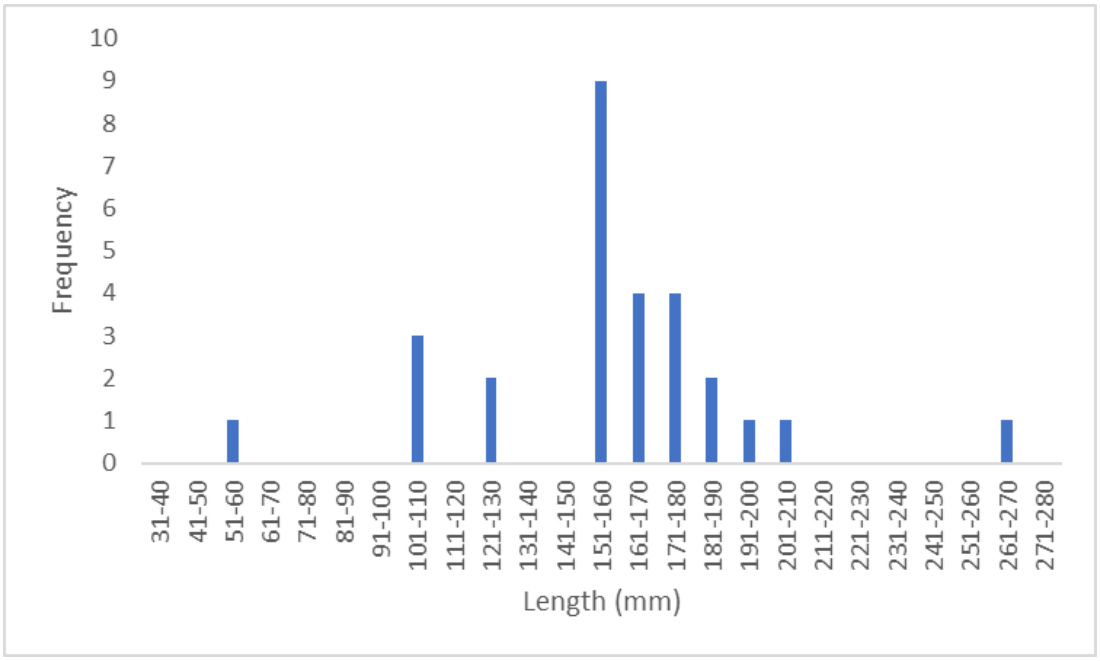


Figure 38. Length Frequency of Juvenile Chinook Sampled Season To-Date (Lookout Point Dam Tailrace)

Table 24. Descriptive Statistics of Target Species Captured at Lookout Point Dam Tailrace, Season To-Date and for the Reporting Period

To-Date (Since March 15, 2022)											
Site	\Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*			
					Min	Max	Mean	Min	Max	Mean	
Lookout Point Dam	PH 1	CHS	Smolt	25	112	266	150.3	15.0	108.9	40.6	
		CHS	Parr	3	84	107	94.3	3.8	10.5	6.5	
		CHS	Fry	0	0	0	0	0	0	0	
	PH 2	CHS	Smolt	8	95	141	119.6	8.4	32.3	19.9	
		CHS	Parr	4	58	108	86.0	2.2	13.4	6.7	
		CHS	Fry	0	0	0	0	0	0	0	
	Spill	CHS	Smolt	32	94	194	133.8	7.6	63.0	27.2	
		CHS	Parr	6	77	126	96.5	5.4	26.1	12.1	
		CHS	Fry	0	0	0	0	0	0	0	
September 16-30, 2022											
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*			
					Min	Max	Mean	Min	Max	Mean	
Lookout Point Dam	PH 1	CHS	Smolt	0	N/A	N/A	N/A	N/A	N/A	N/A	
		CHS	Parr	0	N/A	N/A	N/A	N/A	N/A	N/A	
		CHS	Fry	0	N/A	N/A	N/A	N/A	N/A	N/A	
	PH 2	CHS	Smolt	0	N/A	N/A	N/A	N/A	N/A	N/A	
		CHS	Parr	0	N/A	N/A	N/A	N/A	N/A	N/A	
		CHS	Fry	0	N/A	N/A	N/A	N/A	N/A	N/A	
	\Spill	CHS	Smolt	0	N/A	N/A	N/A	N/A	N/A	N/A	
		CHS	Parr	0	N/A	N/A	N/A	N/A	N/A	N/A	
		CHS	Fry	0	N/A	N/A	N/A	N/A	N/A	N/A	

*Some fry are too small to accurately weigh and are omitted from the above tables.

24-Hour Post Collection Holding Trial

0 Chinook captured in the RSTs was held during this reporting period. 0 fish were held from the PWR RST and 0 fish were held from the Spill RST. 0 hold fish died from the PWR RSTs (0 from PH 1 and 0 from PH 2) (0.0%). 0 of the fish from Spill RST died during holding (0.0%).

Trapping Efficiency

A total of 1,013 juvenile hatchery Chinook (parr) were bismarck brown dyed and adipose clipped, right ventral fin clipped and released on 04/13/2022 below Lookout Point Dam. Fish were released in small groups directly into powerhouse flow at 17:00 to 19:00. 2 fish were recaptured in the PH 1 RST for an

efficiency of 0.2%. 1 Lookout Point Dam trap efficiency fish was captured downstream in the Dexter RST on 4/15/2022.

Mt. Hood Environmental staff noted that fish appeared to be in good condition upon retrieval from the hatchery but did note some descaling and fin damage present as is common among hatchery fish of this age.

Lookout Dam	Release #	Recapture #	Capture Efficiency
Powerhouse	1,013	2	0.2% (2/1,013)

Injuries and Copepod Infection

There were 0 Chinook captured in the Spill Channel RST. Partial descaling <20% was observed on 0 of 0 Chinook collected at the Spill RST (0.0%), and descaling >20% was observed on 0 of the Chinook collected (0.0%). 0 displayed body injuries (0.0%) and 0 had eye injuries (0.0%). None of the Spill RST Chinook had copepods present in the branchial cavity (0.0%) and 0 had copepods present on fins (0.0%). 0 of the fish captured in the Spill RST displayed Gas Bubble Disease (0.0%).

There were 0 Chinook captured in the Powerhouse channel RSTs. Partial descaling <20% was observed on 0 of the 0 Chinook collected at the PWR RSTs (0.0%). Descaling >20% was observed on 0 of the Chinook collected (0.0%). 0 PWR RST fish had bodily injury (0.0%) and 0 had eye injuries (0.0%). 0 of the fish had copepods present in the branchial cavity (0.0%) and 0 had copepods present on fins (0.0%). 0 fish displayed Gas Bubble Disease (0.0%). There were 0 chinook mortality collected in the Spill RST (0.0%) and 0 in the PWR RST (0.0%). Injuries are displayed in Table 25. To date injury data can be found in Appendix A.

Table 25. Number of Descaled, Bodily/Eye Injured, Copepod Infected and Dead Chinook Salmon for Sampling Period (Lookout Point Dam Tailrace).

Site	Route	# CHS Collected	# DSC* <20%	# DSC* >20%	# with Body Injuries	# with Eye Injuries	# with COP* In B.C.	# with COP* on Fins	Mortalities
Lookout Point Dam Tailrace	PWR	0	0	0	0	0	0	0	0
	Spill	0	0	0	0	0	0	0	0

*DSC=Descaled, COP=Copepods, B.C.=Branchial Cavity

Non-Target Species

41 non-target species were captured during the reporting period; the data is summarized below in Table 26.

Table 26. Summary of Non-target Species (Lookout Point Dam Tailrace).

Species	PWR Capture	PWR Mortality	Spill Capture	Spill Mortality	Season Total	Season Total Mortality
Bass Unknown	6	6	0	0	4960	3660
Bluegill	0	0	0	0	3	0
Bullhead	0	0	0	0	3	1
Chinook (clipped)	0	0	0	0	4	0
Crappie	7	6	4	3	371	177
Cutthroat	0	0	0	0	1	0
Largemouth Bass	0	0	0	0	1	0
Smallmouth Bass	1	1	0	0	1	1
Largescale Sucker	0	0	0	0	25	15
Northern Pikeminnow	0	0	0	0	16	9
O. mykiss	0	0	1	0	8	1
O. mykiss (clipped)	0	0	0	0	2	1
Red-Sided Shiner	0	0	0	0	1	0
Sculpin	5	1	17	4	85	11
Walleye	0	0	0	0	10	3
Unknown	0	0	0	0	2	1
Totals	**19**	**14**	**22**	**7**	**5410**	**3880**

Stream Statistics

Basic stream statistics at Lookout Dam Tailrace site were calculated from data downloaded from the U.S. Geological Survey stream gauge number 14149010. Total dissolved gas saturation or dissolved oxygen concentration measurements are not available at this stream gauge site, or any nearby stream gauges. Gauge height (feet) is the only metric provided at this gauge. During the reporting period, daily maximum values for instantaneous gauge height ranged from 691.4 feet to 693.3 feet (mean: 692.4 feet). Figure 39 shows instantaneous gauge height.

Stream temperatures were recorded every two hours using a temperature probe at the Lookout Dam RST site during this reporting period. Temperature probes operated normally, and the data is shown below in (figures 40 and 41).

Flows through the Powerhouse and Spill during the reporting period averaged 407.4 and 1,300.8 cubic feet per second (cfs) respectively (Figure 42). Catch per unit of effort (CPUE) data are summarized in Table 27. Discharge and capture data for the duration of monitoring efforts at this location are provided in Appendix B.

Table 27. Summary of Chinook CPUE at Lookout Point Dam Tailrace.

	Chinook		
Description	**PH 1**	**PH 2**	**Spill**
Catch	0	0	0
Effort (hrs)	339.15	329.42	329.78
CPUE (fish/hr)	0	0	0

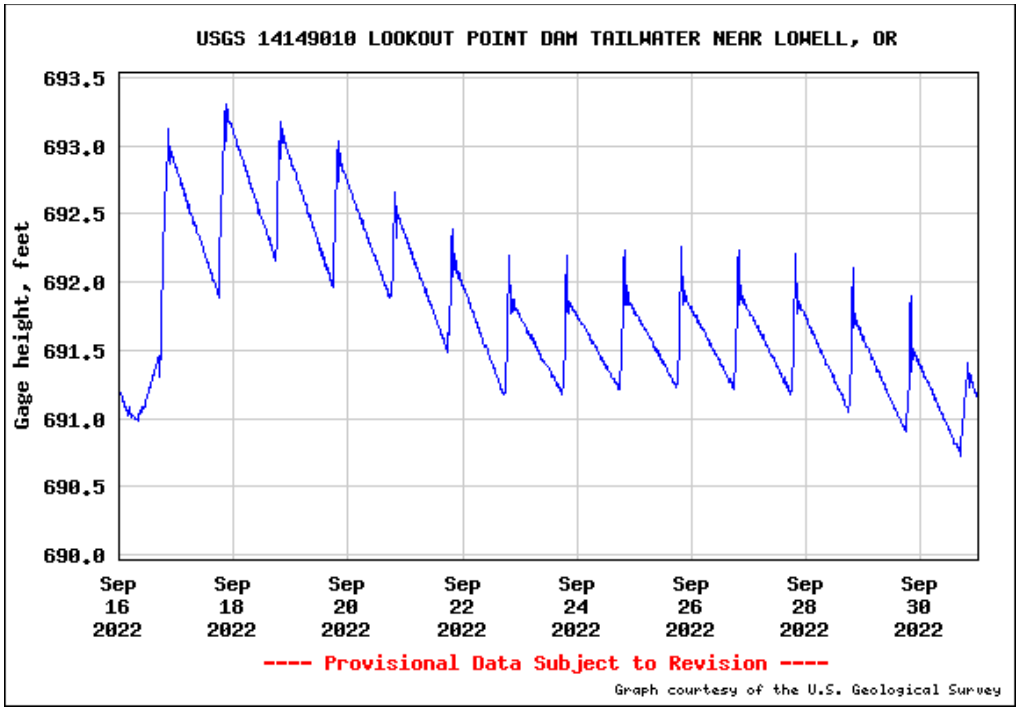


Figure 39. Gauge Height (feet); below Lookout Dam

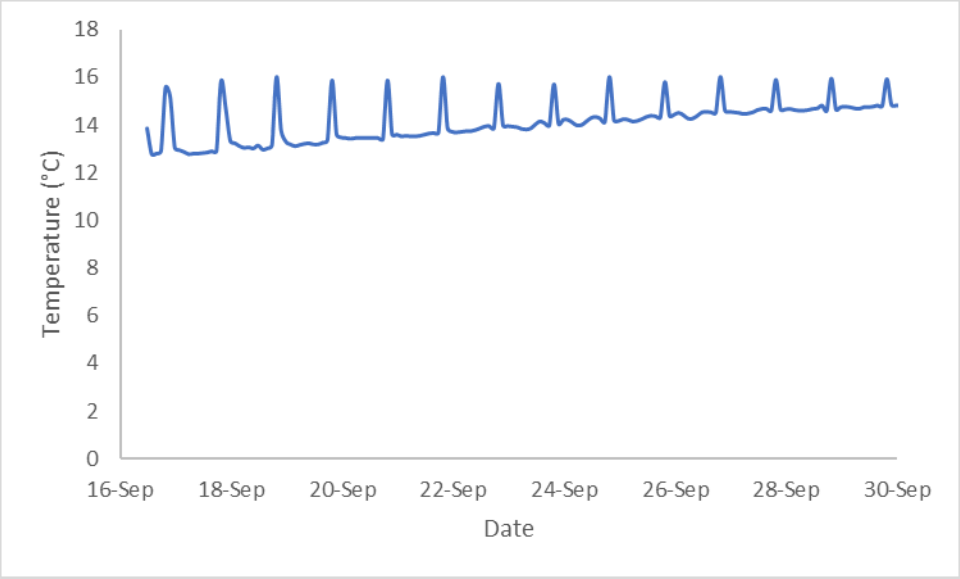


Figure 40. Temperature at RST (Lookout Dam PWR)

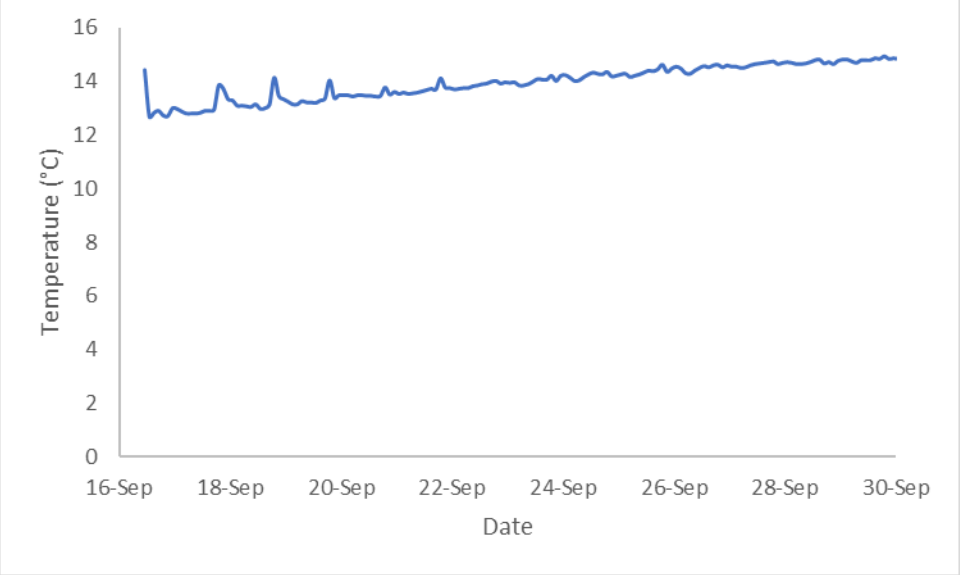


Figure 41. Temperature at RST (Lookout Dam Spill)

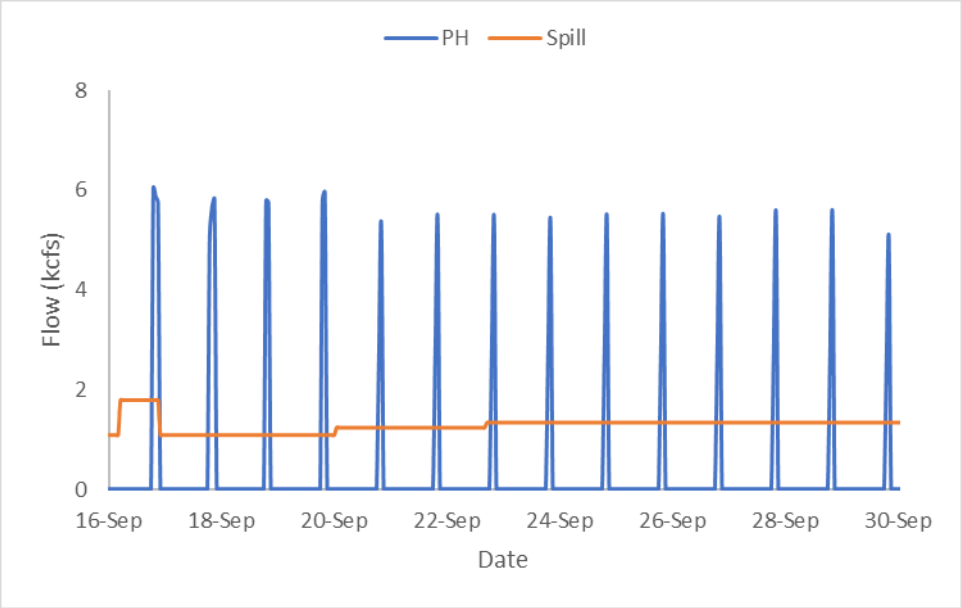


Figure 42. Hourly Flows PWR vs. Spill (Lookout Dam Tailrace)

Middle Fork Willamette – Lookout Point Head of Reservoir

Target Species

The reporting period began September 16 and ended on September 30. 2 Chinook salmon were captured during the 15-day sampling period (Figure 43). The Lookout Point Head of Reservoir trap was raised on the 23rd due to hazardous air quality conditions and returned to sampling on the 25th after conditions improved. The trap was operated 86.7% of the reporting period. Table 28 provides life stage, length, and weight data for all Chinook salmon that have been caught at the Middle Fork Willamette - Lookout Point Head of Reservoir site to-date and Figure 44 shows length frequency data to-date.

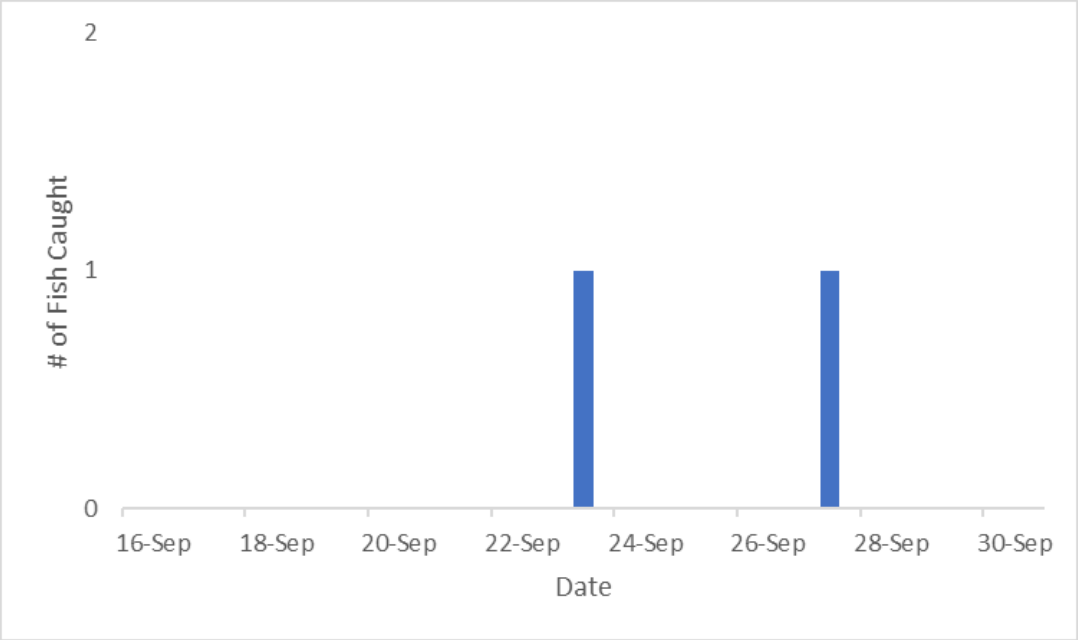


Figure 43. Chinook Captured Per Day 09/16/2022 to 09/30/2022 (Lookout Point Head of Reservoir)

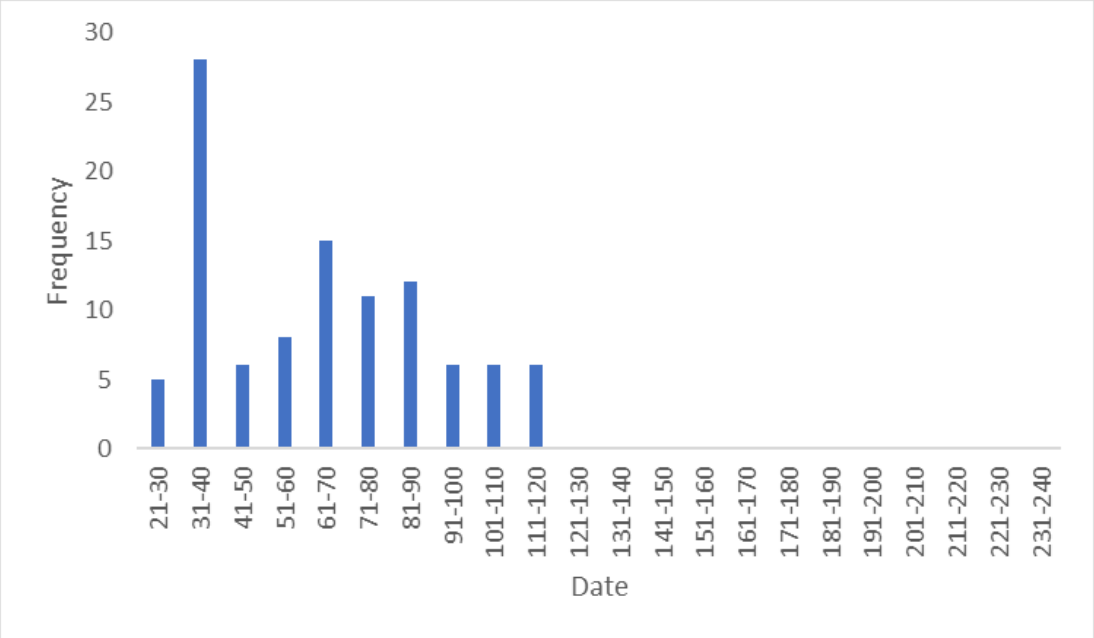


Figure 44. Length Frequency of Juvenile Chinook Sampled Season To-Date (Lookout Point Head of Reservoir)

Table 28. Descriptive Statistics of Target Species Captured at Lookout Point Head of Reservoir, Season To-Date and for the Reporting Period

To-Date											
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*			
					Min	Max	Mean	Min	Max	Mean	
Lookout Point Head of Reservoir	5 ft	CHS	Smolt	3	111	118	114.5	15.0	17.5	16.3	
		CHS	Parr	59	59	115	80.0	1.0	19.8	5.9	
		CHS	Fry	41	28	69	37.2	N/A	N/A	N/A	
September 16-30, 2022											
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*			
					Min	Max	Mean	Min	Max	Mean	
Lookout Point Head of Reservoir	5 ft	CHS	Smolt	2	111	111	111	15	15	15	
		CHS	Parr	0	N/A	N/A	N/A	N/A	N/A	N/A	
		CHS	Fry	0	N/A	N/A	N/A	N/A	N/A	N/A	

*Some fry are too small to accurately weigh and are omitted from the above tables.

Trapping Efficiency

A total of 1,005 juvenile hatchery Chinook (sub-yearlings) were bismarck brown dyed and adipose clipped and released on 7/20/2022 above the Lookout Point Head of Reservoir trap. Fish were released in small groups to evaluate the traps efficiency capturing fish migrating downstream. 9 fish were recaptured in the 5-foot RST for an efficiency of 0.9%.

Of the 9 fish recaptured, 1 was dead. Injuries were descaling and fin damage.

Lookout Point Head of Reservoir	Release #	Recapture #	Capture Efficiency
07/20/2022	1005	9	0.9% (9/1005)

Injuries and Copepod Infection

There were 2 Chinook captured during this reporting period. 1 had partial descaling <20% (50.0%) and 0 had body injuries (0.0%). There was 0 incidental mortality (0.0%). Injury data for the reporting period is shown in table 29. To date data can be found in Appendix A.

Table 29. Number of Descaled, Bodily/Eye Injured, Copepod Infected and Dead Chinook Salmon for Sampling Period (Lookout Point Head of Reservoir).

Site	# CHS Collected	# DSC* <20%	# DSC* >20%	# with Body Injuries	# with Eye Injuries	# with COP* In B.C.	# with COP* on Fins	Mortalities
Lookout Point Head of Reservoir	2	1	0	0	0	0	0	0

*DSC=Descaled, COP=Copepods, B.C.=Branchial Cavity

Collected DNA and Scale Samples

No scales and DNA were collected from Chinook captured for the reporting period.

VIE Marking

Visual Implant Elastomer (VIE) trials commenced at the Lookout Point Head of Reservoir site on 6/25/2022. VIE tag color and locations are changed every reporting period to distinctly mark groups of fish by capture date. Since then, 3 Chinook have been VIE marked to the left of the dorsal fin with fluorescent yellow elastomer. 1 fish has been VIE marked to the left of the dorsal fin with fluorescent red elastomer. No fish with VIE marks have been detected at downstream RST sites to date.

Date Tagged	VIE Color	# Tagged	# Recaptured to Date
6/25/2022-7/15/2022	Yellow	3	0
7/16/2022-7/31/2022	Red	1	0

Non-Target Species

10 non-target species were captured during the reporting period; the data is summarized below in Table 30.

Table 30. Summary of Non-target Species (Lookout Point Head of Reservoir).

Species	5ft Capture	5ft Mortality	Season Total	Season Total Mortality
Bass Unknown	0	0	2	0
Bluegill	0	0	2	0
Chinook (clipped)	0	0	26	0
Cutthroat Trout	0	0	10	0
Dace	2	0	127	0
Lamprey	0	0	2	0
Largescale Sucker	0	0	16	1
Mountain Whitefish	0	0	3	0
Northern Pikeminnow	2	0	24	0
O. mykiss	2	0	86	3
O. mykiss (clipped)	0	0	2	0
Peamouth	0	0	1	0
Red-Sided Shiner	0	0	2	0

Sculpin	4	0	24	7
Smallmouth Bass	0	0	8	0
Unknown	0	0	10	0
Totals	**10**	**0**	**332**	**11**

Stream Statistics

Basic stream statistics for the Lookout Point Head of Reservoir RST site were calculated from data downloaded from the U.S. Geological Survey stream gauge number 14148000. During the reporting period, daily maximum values for instantaneous discharge ranged from 1,180.0 cfs to 1,810.0 cfs (mean: 1,390.7 cfs). Figure 45 shows instantaneous discharge.

Stream temperatures were recorded every two hours using a temperature probe at the Lookout Point Head of Reservoir RST site during this reporting period. The probe operated normally during this period. (Figure 46).

Flows into Lookout Point Reservoir averaged 1,455.2 cfs (Figure 47). Catch per unit of effort (CPUE) data are summarized in Table 31. Discharge and capture data for the duration of monitoring efforts at this location are provided in Appendix B.

Table 31. Summary of Chinook CPUE at Lookout Point Head of Reservoir.

	Chinook
Description	**5 ft**
Catch	2
Effort (hrs)	283.9
CPUE (fish/hr)	0.007

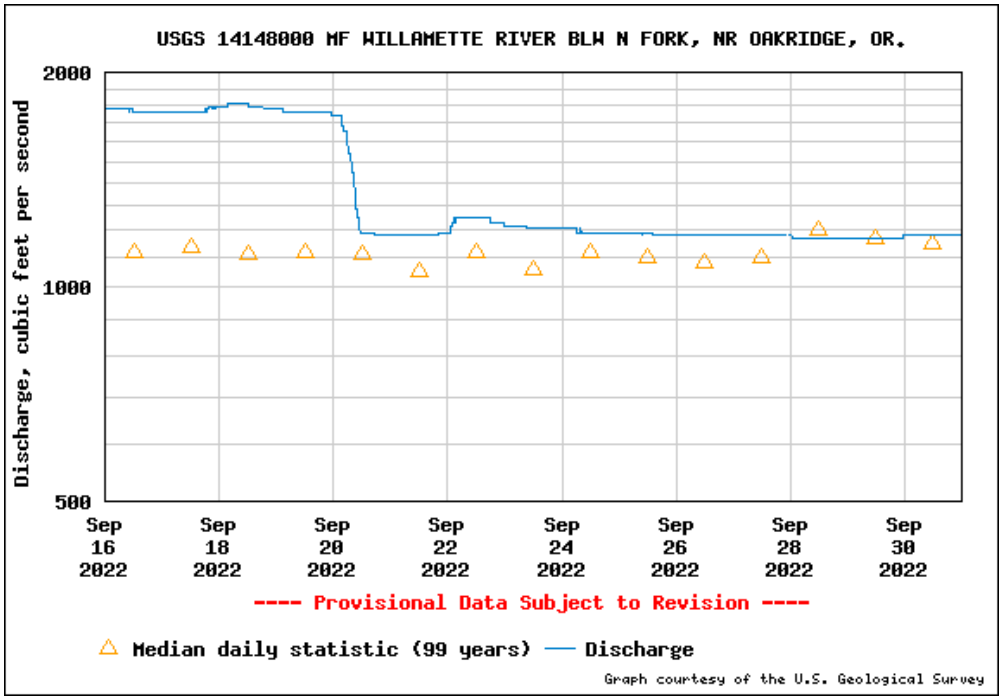


Figure 45. Discharge (cfs); above Lookout Point Reservoir, Below Oakridge, OR

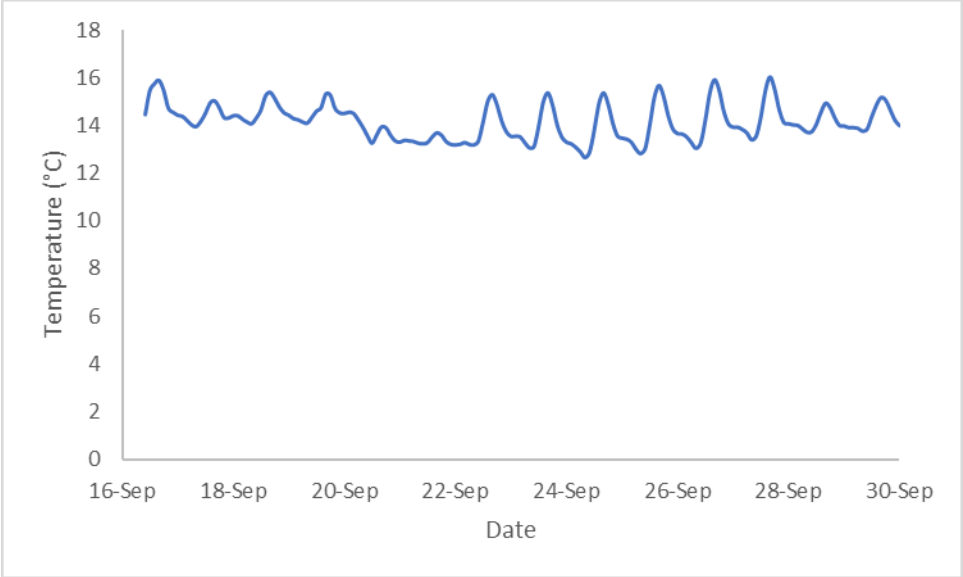


Figure 46. Temperature at RST (Lookout Point Head of Reservoir)

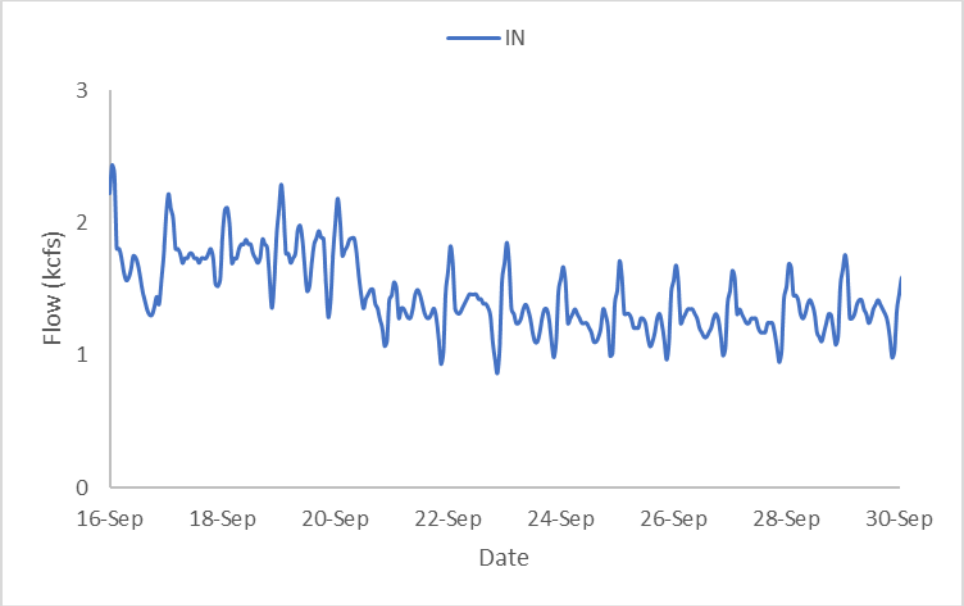


Figure 47. Hourly Flows (Lookout Point Head of Reservoir site)

Middle Fork Willamette – Hills Creek Dam

Target Species

This reporting period began on September 16 and ended on September 30. There were 5 Chinook salmon (CHS) captured during the 15-day sampling period (Figure 48). Cones were raised on the 23rd due to hazardous air quality conditions and returned to sampling on the 25th after conditions improved. Sampling durations were 86.7% for both RO RST and Powerhouse RST. Table 4 provides life stage, length, and weight data for all Chinook salmon that have been caught at the Hills Creek Dam site to-date and Figure 49 shows length frequency data to-date.

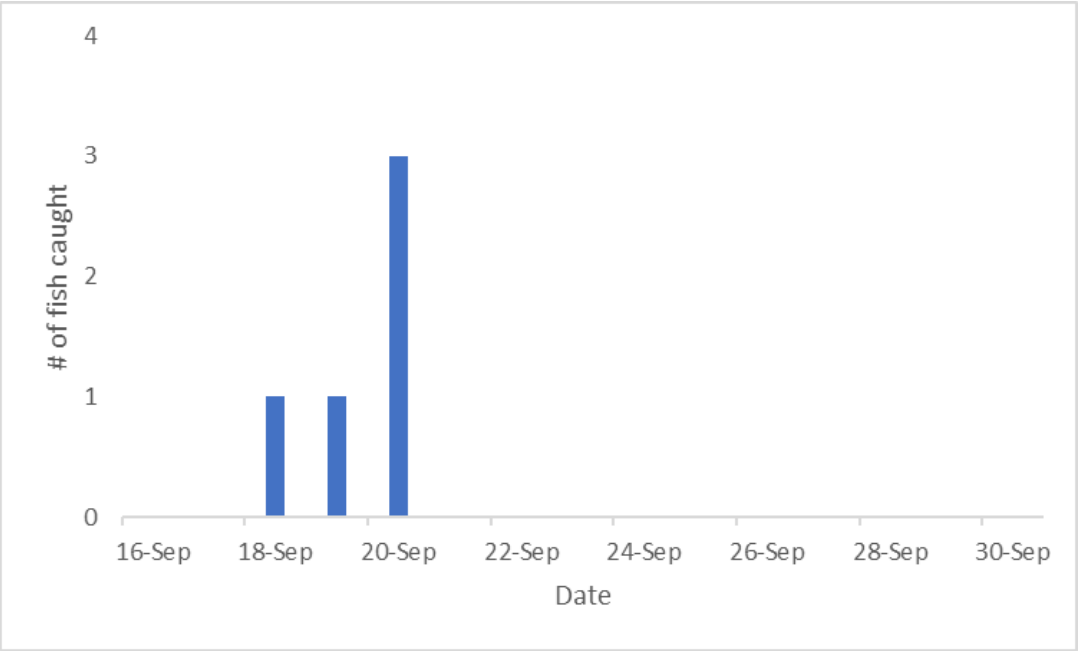


Figure 48. Chinook Captured Per Day 09/16/2022 to 09/30/2022 (Hills Creek Dam)

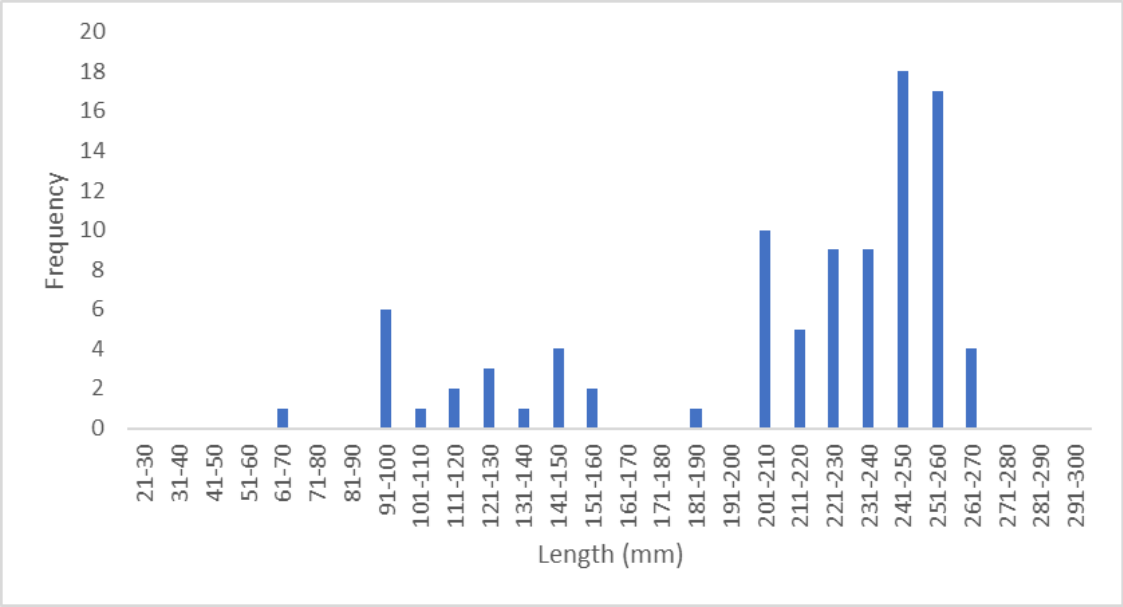


*Figure does not include fish without heads or fish used for trapping efficiency

Figure 49. Length Frequency of Juvenile Chinook Sampled Season To-Date (Hills Creek Dam)

Trapping Efficiency

2 trapping efficiency trials have been conducted at Hills Creek Dam. The first being on 2/16/2022 and the second being on 2/25/2022.

During the first Trapping Efficiency trial, a total of 600 juvenile Chinook (parr) were dyed, clipped and released on 02/16/2022 below Hills Creek PWR and 593 below the RO to evaluate the efficiency of the screw trap at those locations. A total of 8 fish were recaptured in the 8ft PWR trap on 2/16/2022 and an additional 4 captured on 2/17/2022 for a total of 12 chinook recaptures in the PWR trap. A total of 19 chinook were captured in the 5ft RO trap on 02/17/2022. No PWR route fish were captured in the RO trap. Route-specific trapping efficiency was 2.0% at the PWR trap and 3.2% at the RO.

Of the fish recaptured,1 was dead and an additional 27 were injured of the total 31 recaptures. Injuries were primarily descaling (16) and fin damage (26). Mt. Hood Environmental staff noted that most fish appeared to have minor descaling with some fin damage, but in good condition overall upon retrieval from the hatchery.

Hills Creek Dam	Release #	Recapture #	Capture Efficiency
PWR Route	600	12	2.0% (12/600)
RO Trap	593	19	3.2% (19/593)

*Live fish captured at the PWR trap are released just downstream of the PWR trap, upstream of the RO trap and therefore retained in the capture efficiency estimates for the RO Trap if they arrive in the lower trap.
*Any dead fish captured at the PWR trap are excluded from the RO trap capture efficiency estimate as they are not alive at time of re-release.

During the second Trapping Efficiency trial, a total of 604 juvenile Chinook (parr) were dyed, clipped and released on 02/25/2022 below Hills Creek PWR and 625 below the RO to evaluate the efficiency of the screw trap at those locations. A total of 5 fish were recaptured in the 8ft PWR trap on 2/26/2022 and an additional 1 captured on 2/27/2022 for a total of 6 chinook recaptures in the PH trap. A total of 6 chinook were captured in the 5ft RO trap on 02/26/2022 and an additional 1 captured on 2/27/2022 for a total of 7 chinook recaptures in the RO trap. No PWR route fish were captured in the RO trap. Route-specific trapping efficiency was 0.99% at the PH trap and 1.12% at the RO.

Of the fish recaptured,1 was dead and an additional 11 were injured of the total 13 recaptures. Injuries were primarily descaling (11) and fin damage (12). Mt. Hood Environmental staff noted that most fish appeared to have minor descaling with some fin damage, but in good condition overall upon retrieval from the hatchery.

Hills Creek Dam	Release #	Recapture #	Capture Efficiency
PWR Route	604	6	0.99% (6/604)
RO Trap	625	7	1.12% (7/625)

*Live fish captured at the PWR trap are released just downstream of the PWR trap, upstream of the RO trap and therefore retained in the capture efficiency estimates for the RO Trap if they arrive in the lower trap.
*Any dead fish captured at the PWR trap are excluded from the RO trap capture efficiency estimate as they are not alive at time of re-release.

Table 32. Descriptive Statistics of Target Species Captured at Hills Creek Dam Season To-Date and for the Reporting Period

To-Date										
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Hills Creek	RO	CHS	Parr	6	90.0	141.0	110.7	7.4	23.4	13.3
		CHS	Smolt	62	137.0	265.0	230.9	27.35	192.3	143.9
Hills Creek	PWR	CHS	Parr	7	69.0	127.0	98.1	3.7	24.5	11.2
		CHS	Smolt	25	128.0	265.0	224.3	26.2	188.7	130.6

*Fish that were missing heads are not included in length and weight calculations. One fish was a head only and could not be assigned a life stage.

September 16-30, 2022										
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Hills Creek	RO	CHS	Parr	0	N/A	N/A	N/A	N/A	N/A	N/A
		CHS	Smolt	5	188	225	209.8	77.9	183.7	126.2
Hills Creek	PWR	CHS	Parr	0	N/A	N/A	N/A	N/A	N/A	N/A
		CHS	Smolt	0	N/A	N/A	N/A	N/A	N/A	N/A

Injuries and Copepod Infection

There were 5 Chinook captured in the RO RST. Partial descaling <20% was observed on 2 of 5 Chinook collected at the RO RST (40.0%), and descaling >20% was observed on 3 of the Chinook collected (60.0%). 5 displayed body injuries (100.0%) and 1 had eye injuries (20.0%). All of the RO RST Chinook had copepods present in the branchial cavity (100.0%) and 3 had copepods present on fins (60.0%). 2 of the fish captured in the Spill RST displayed Gas Bubble Disease (level 2) (40.0%).

There were 0 Chinook captured in the Powerhouse channel RST. Partial descaling <20% was observed on 0 of the 0 Chinook collected at the PWR RSTs (0.0%). Descaling >20% was observed on 0 of the Chinook collected (0.0%). 0 PWR RST fish had bodily injury (0.0%) and 0 had eye injuries (0.0%). 0 of the fish had copepods present in the branchial cavity (0.0%) and 0 had copepods present on fins (0.0%). 0 fish displayed Gas Bubble Disease (0.0%). There were 2 chinook mortalities collected in the Spill RST (40.0%) and 0 in the PWR RST (0.0%). Injuries are displayed in Table 5. To date injury data can be found in Appendix A.

Table 33. Number of Descaled, Bodily/Eye Injured, Copepod Infected and Dead Chinook Salmon for Sampling Period. (Hills Creek Dam)

Site	Route	# 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	5	2	3	5	1	5	3	2
Hills Creek	PWR	0	0	0	0	0	0	0	0

*DSC=Descaled, COP=Copepods, B.C.=Branchial Cavity

Non-Target Species

A total of 25 non-target fish were captured at Hills Creek during the reporting period; the data is summarized below in Table 6.

Table 34. Summary of Non-target Species (Hills Creek Dam).

Species	RO Capture	RO Mortality	PWR Capture	PWR Mortality	Season Total	Season Total Mortality
Bluegill	4	0	0	0	54	27
Brook Lamprey	0	0	0	0	1	0
Bullhead	4	0	0	0	1	0
Bull Trout	0	0	0	0	1	0
Crappie	5	0	0	0	61	40
Longnose Dace	0	0	0	0	2	0
Red-Sided Shiner	0	0	0	0	18	2
Sculpin	1	0	0	0	46	0
Spotted Bass	6	2	0	0	6	1
Sucker	0	0	0	0	2	1
Mountain Whitefish	0	0	0	0	1	1
O. mykiss	1	0	0	0	64	22
Unknown	4	2	0	0	4	2
Totals	**25**	**4**	**0**	**0**	**282**	**98**

Stream Statistics

Basic stream statistics at the Hills Creek site were calculated from data downloaded from the U.S. Geological Survey stream gauge numbers 14145110 and 14145500. Gauge height (feet) is the only metric provided at this gauge. Total dissolved gas saturation data was received from gauge 14145500, 1.4 rkms downstream of the trap. During the reporting period, daily maximum values for instantaneous gauge height ranged from 1,224.7 feet to 1,225.6 feet (mean: 1,225.0 feet). Figure 50 shows instantaneous gauge height.

Total dissolved gas saturation ranged from 102 to 107% (mean: 103.5%) during the reporting period. Figure 51 shows total dissolved gas saturation.

Stream temperatures were recorded every 2 hours for the both the RO RST and the PWR RST (Figures 52 and 53). The PWR temperature probe was deployed on 9/23 and operated normally throughout this reporting period. The RO temperature reporting was collected from daily trap checks.

Flows through the PWR and RO during the reporting period averaged 0 and 956.1 cubic feet per second (cfs) respectively (Figure 54). Catch per unit of effort (CPUE) data are summarized in Table 7. Discharge and capture data for the duration of monitoring efforts at this location are provided in Appendix B.

Table 35. Summary of Chinook CPUE, Hills Creek Dam.

	Chinook	
Description	RO (5ft)	PWR (8ft)
Catch	5	0
Effort (hrs)	304.1	303.8
CPUE (fish/hr)	0.016	0

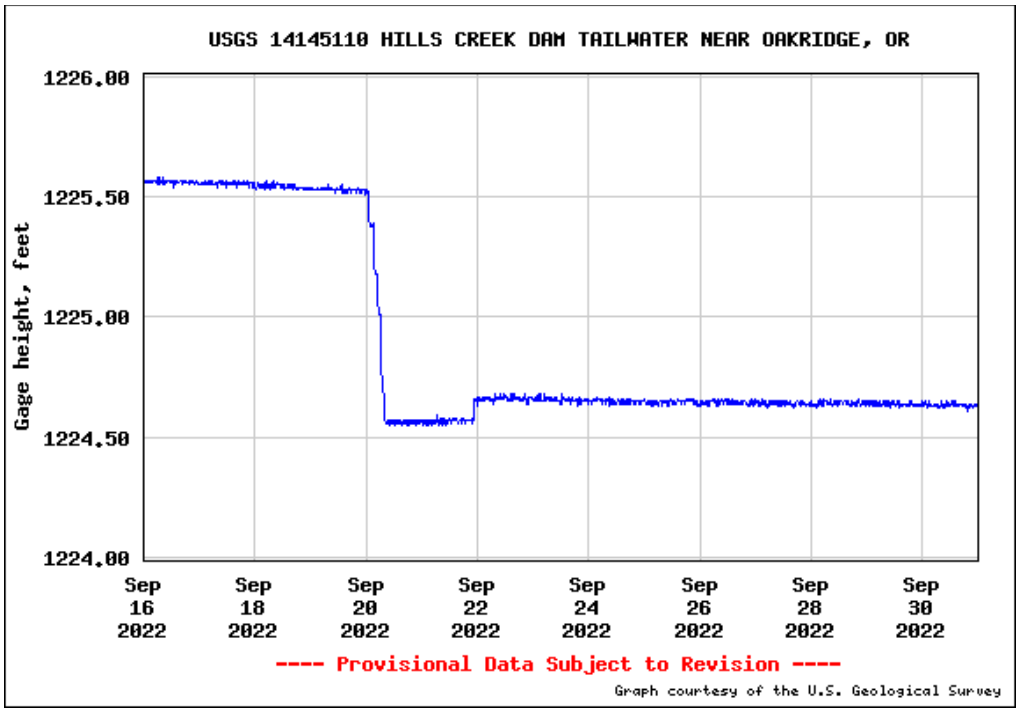


Figure 50. Gauge Height (feet); below Hills Creek Dam PWR - Middle Fork Willamette River

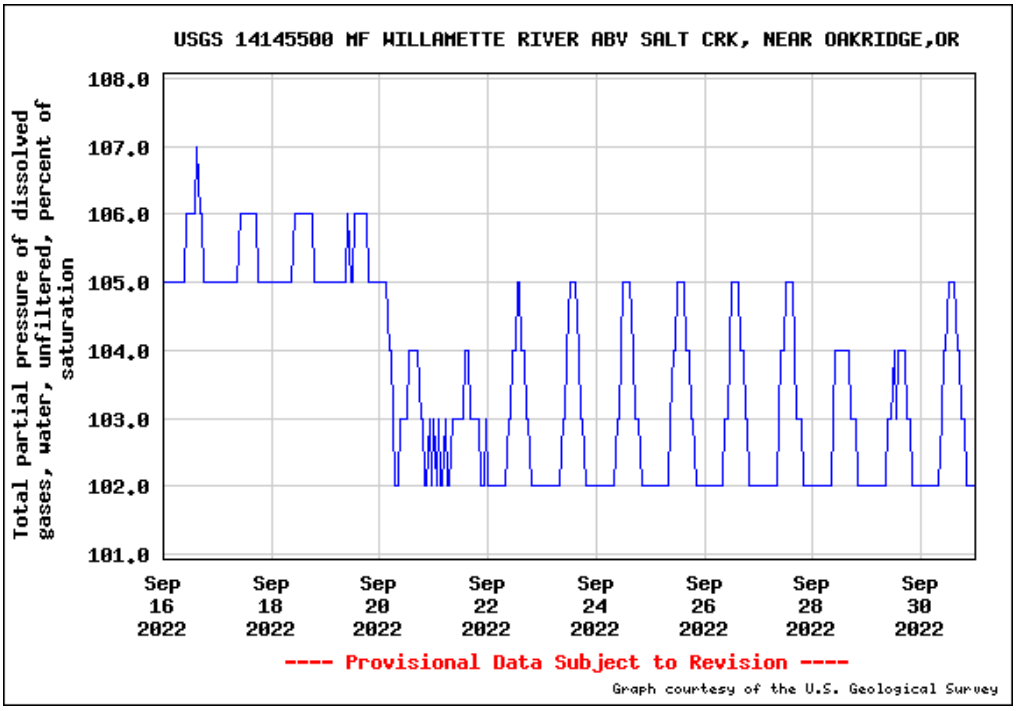


Figure 51. Total Dissolved Gas Saturation (%); below Hills Creek Dam – Middle Fork Willamette River

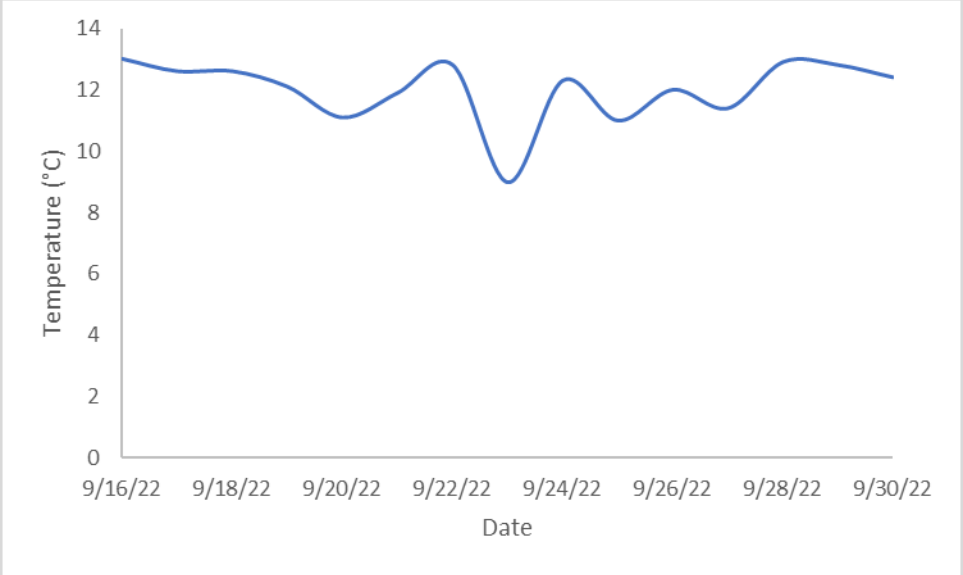


Figure 52. Temperature at RO RST (Hills Creek Dam)

Note: Temperature used from daily trap checks due to absence of temperature logger.

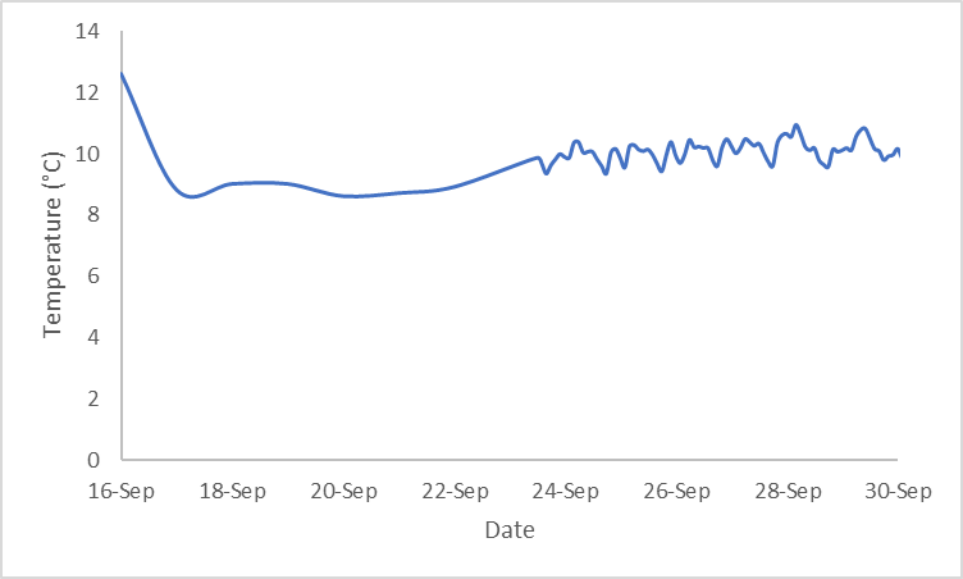


Figure 53. Temperature at Powerhouse RST (Hills Creek Dam)

Note: Temperature prior to 9/24 is supplemented with daily trap checks due to absence of temperature logger for first days of operation.

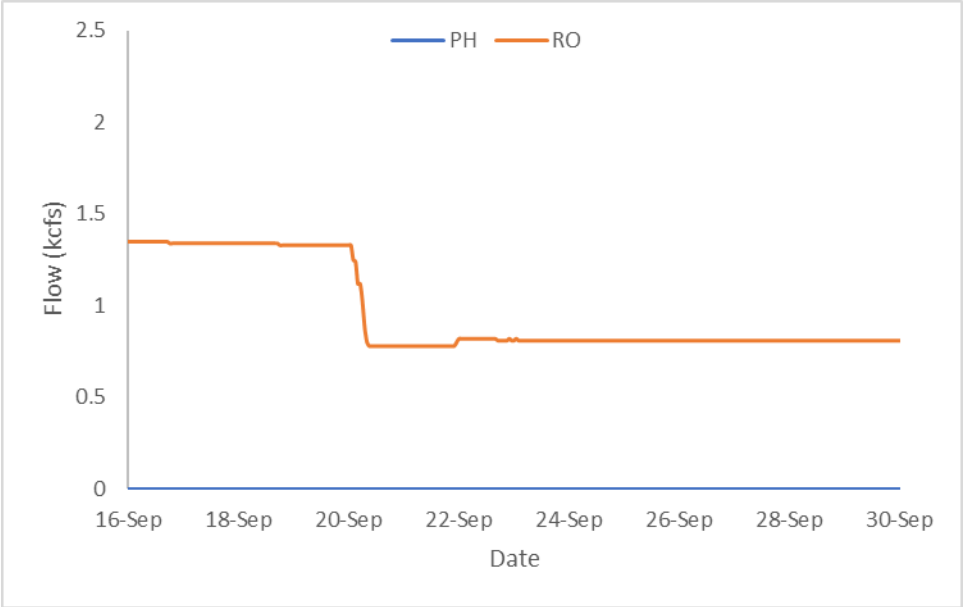


Figure 54. Hourly Flows PWR vs. RO (Hills Creek Dam)

Issues Encountered

The Cedar Creek Fire is still active Southeast of the town of Oakridge near two of our sites on the Middle Fork Willamette River. Air quality exceeded 300 ppm this reporting period. Hills Creek Dam and Lookout

Point Head of Reservoir traps were raised to a non-sampling position on September 23rd. Lookout Point Dam and Dexter Dam traps were raised to a non-sampling position on September 24th. All traps began fishing again on September 25th.

Upcoming USACE Support Services

None at this time.

Appendix A

Chinook (CHS)

Chinook Injuries to-date																							
Site/Trap/Life Stage	Total Fish	MUNK	DS<2	BLO	EYB	FUN	BKD	COP	DS>2	PRD	FID	HBO	BO	HO	BVT	HBP	BRU	TEA	OPD	HIN	FVB	POP	GBD
Big Cliff Dam	1088		667	4	75	3	1	827	250	4	544	5	10	4	24	6	64	35	117	68	63	13	32
8 ft	1088		667	4	75	3	1	827	250	4	544	5	10	4	24	6	64	35	117	68	63	13	32
Adult	1		1								1						1	1	1		1		
Parr	24		6		1	1		15	3		6					2			1				
Smolt	1052		660	4	73	2		812	246	4	536	5	10	2	24	4	62	34	114	67	62	12	32
Unknown	2													2								1	
Fry	9				1		1		1		1						1		1	1			
Foster Dam HOR	66		9		1						2												
5 ft	66		9		1						2												
Parr	8		5								1												
Smolt	3		3								1												
Fry	55		1		1																		
Unknown	2													2									
Fry	382	10	2		4				6		5				1		2	7	3	3		3	
Cougar Dam	1361	10	584	6	85	5	3	616	163	3	345	2	4	2	25	4	39	36	82	43	38	7	25
RO	381		212	2	60	2	3	252	79	3	151	2			6	2	19	9	42	25	9	3	21
Parr	135		70		23			77	25		48				1		5	2	11	7			6
Smolt	225		142	2	34	2	3	175	53	3	102	2			5	2	13	7	30	16	9	3	15
Fry	21				3				1		1						1		1	2			
PH	980	10	372	4	25	3		364	84		194		4	2	19	2	20	27	40	18	29	4	4
Parr	265		146		11	1		103	25		67		1		5		3	5	11	6	5		
Smolt	331		224	4	10	2		261	53		122		3		13	2	15	15	26	9	24	1	4
Unknown	2													2									
Fry	382	10	2		4				6		5				1		2	7	3	3		3	
Cougar Dam HOR	619	3	46					5		1	25							3	7	6	1	1	
5 ft	619	3	46					5		1	25							3	7	6	1	1	
Parr	87		43					5			17							3			1		
Smolt	4		1																				
Fry	528	3	2							1	8								7	6		1	
Fall Creek HOR	7		3					2			1												
8 ft	7		3					2			1												
Parr	2		2					1			1												
Smolt	5		1					1															
Dexter Dam Tail.	98		59		6			11	23		46				1		3	4	6	6	4		20
5 ft	98		59		6			11	23		46				1		3	4	6	6	4		20
Parr	18		6		3			2	6		8							2	3	2			6
Smolt	77		53		3			9	17		37				1		3	2	3	4	4		14
Fry	3										1												

Chinook Injuries to-date																							
Site/Trap/Life Stage	Total Fish	MUNK	DS<2	BLO	EYB	FUN	BKD	COP	DS>2	PRD	FID	HBO	BO	HO	BVT	HBP	BRU	TEA	OPD	HIN	FVB	POP	GBD
Lookout Dam Tail.	78		41	1	15	1		14	28		44				2	2	9	1	15	9	6		8
PH 1	28		11	1	7			7	14		19				2	2	6		8	2	1		2
Parr	3				1				2		2					1	1		1				
Smolt	25		11	1	6			7	12		17				2	1	5		7	2	1		2
PH 2	12		10		3			2	2		9						1	1	2	4	1		
Parr	4		4		3				1		4						1	1	1	3			
Smolt	8		6					2	1		5								1	1	1		
Spill	38		20		5	1		5	12		16						2		5	3	4		6
Parr	6		1						3		1												
Smolt	32		19		5	1		5	9		15						2		5	3	4		6
Lookout Point HOR	103		31					2			12						1		1				
5 ft	103		31					2			12						1		1				
Parr	59		29					1			9						1		1				
Smolt	3		1					1			1												
Fry	41		1								2												
Hills Creek Dam	100	1	55		11			75	35		25		8	1	27	8	3	3	7	3	4		2
RO	68	1	37		5			54	24		18		6		21	6	2	2	6	1	1		2
Parr	6		1					1									1						
Smolt	62	1	36		5			53	24		18		6		21	6	1	2	6	1	1		2
PH	32		18		6			21	11		7		2	1	6	2	1	1	1	2	3		
Parr	7		4					1	1							1				1			
Smolt	25		14		6			20	10		7		2	1	6	1	1	1	1	1	3		

Chinook (CHS)

Chinook Injuries During Reporting Period (9-16-2022 to 9-30-2022)																							
Site/Trap/Life Stage	Total Fish	MUNK	DS<2	BLO	EYB	FUN	BKD	COP	DS>2	PRD	FID	HBO	BO	HO	BVT	HBP	BRU	TEA	OPD	HIN	FVB	POP	GBD
Big Cliff Dam	30		19		1			28	9	1	23				1		4	2	6	4	5		1
8 ft	30		19		1			28	9	1	23				1		4	2	6	4	5		1
Smolt	30		19		1			28	9	1	23				1		4	2	6	4	5		1
Cougar Dam	63		51	1				60	6		29				4		3	4	5		4		
PH	63		51	1				60	6		29				4		3	4	5		4		
Parr	2		1					1			1												
Smolt	61		50	1				59	6		28				4		3	4	5		4		
Cougar Dam Head of	43		23					2			11							3					
5 ft	43		23					2			11							3					
Parr	39		22					2			11							3					
Smolt	4		1																				
Dexter Dam Tailrace	1																						
5 ft	1																						
Parr	1																						
Lookout Point Head	2		1					1			1												
5 ft	2		1					1			1												
Smolt	2		1					1			1												
Hills Creek Dam	5		2		1			5	3		5				3				2				2
RO	5		2		1			5	3		5				3				2				2
Smolt	5		2		1			5	3		5				3				2				2

Steelhead (O. mykiss)

O. mykiss Injuries To Date																						
Site/Trap/Life Stage	Total Fish	MUNK	DS<2	BLO	EYB	FUN	BKD	COP	DS>2	PRD	FID	HBO	BO	HO	BVT	HBP	BRU	TEA	OPD	HIN	FVB	POP	GBD
Big Cliff Dam	60		17		1			10	5		15		1		1		4	3	5	6			1
8 ft	60		17		1			10	5		15		1		1		4	3	5	6			1
Adult	1								1		1		1										
Parr	16		4		1						4									1			
Smolt	16		10					10	4		9				1		3	3	5	5			1
Fry	27		3								1						1						
Green Peter Tailrace	6		3		1			1	2		4						4		1	1			5
8 ft	6		3		1			1	2		4						4		1	1			5
Smolt	6		3		1			1	2		4						4		1	1			5
Foster Dam Head of	90		25					1			11							1					
5 ft	90		25					1			11							1					
Adult	7		1								2												
Parr	17		7					1			2												
Smolt	35		17								7							1					
Fry	31																						

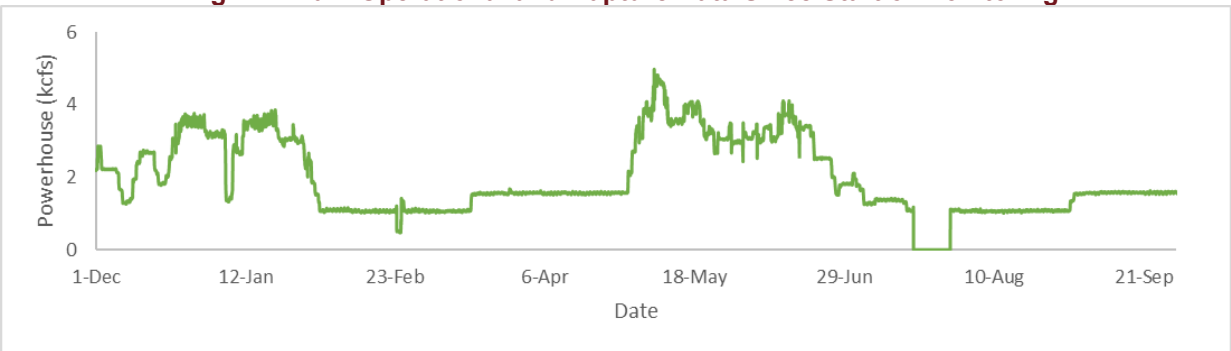
Steelhead (O. mykiss)

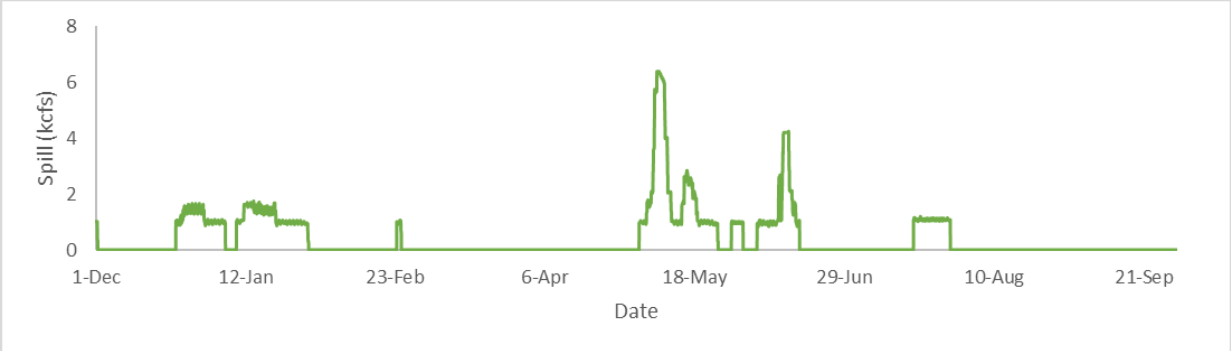
O. mykiss Injuries During Reporting Period (9-16-2022 to 9-30-2022)																						
Site/Trap/Life Stage	Total Fish	MUNK	DS<2	BLO	EYB	FUN	BKD	COP	DS>2	PRD	FID	HBO	BO	HO	BVT	HBP	BRU	TEA	OPD	HIN	FVB	POP	GBD
Big Cliff Dam	2										2							1					
8 ft	2										2							1					
Parr	1										1												
Smolt	1										1							1					

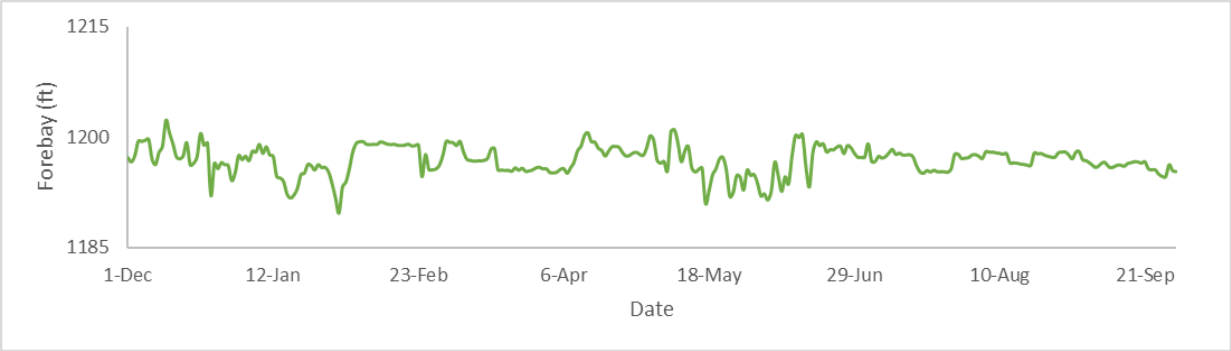
Injury Code	Description of Injury/Condition
NXI	Live fish with no external injuries
MUNK	Mortality with no external injuries
DS<2	Descaling <20%
BLO	Bloated
EYB	Bloody Eye (hemorrhage)
BVT	Bleeding from Vent
FVB	Fin Blood Vessels Broken
GBD	Gas Bubble Disease (fin ray/eye inclusions)
POP	Pop Eye (eye popping out of head)
HIN	Head Injury
OPD	Operculum Damage
TEA	Body Injury (tears, scrapes, mechanical damage)
BRU	Bruising (any part of the body)
HBP	Hole Behind Pectoral Fin
DS>2	Descaling > 20%
HO	Head Only
BO	Body Only
HBO	Head Barely Connected
FID	Fin Damage
PRD	Predation Marks (vert. claw or teeth marks)
COP	Copepods (on gills or fins)
BKD	BKD (distended abdomen)
FUN	Fungus

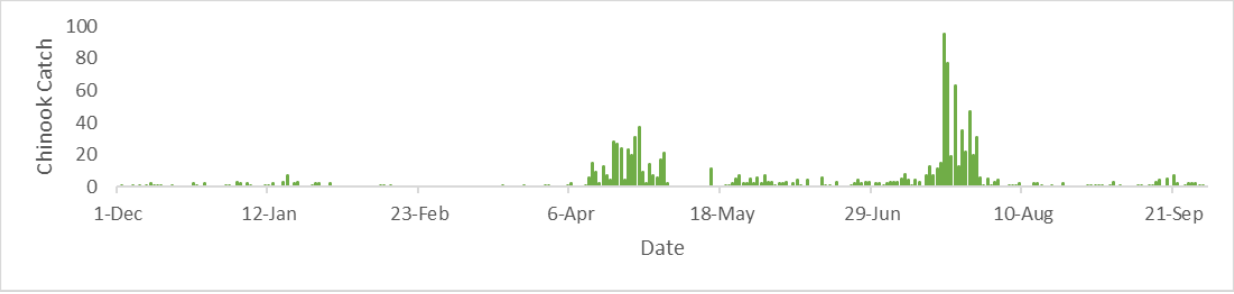
Appendix B

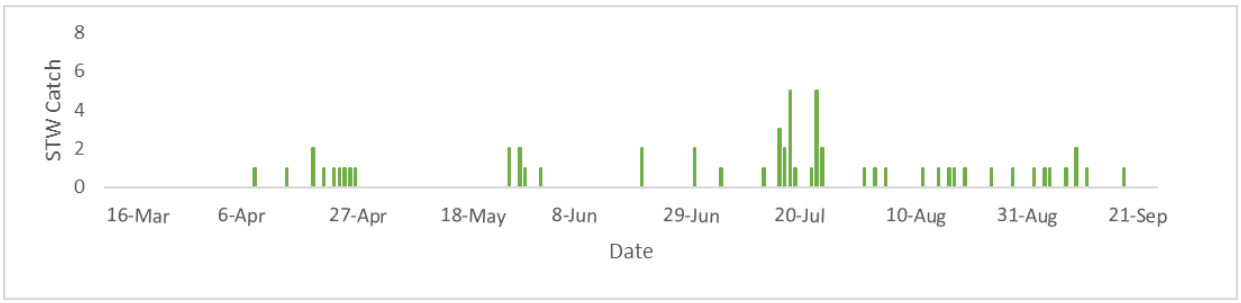
Big Cliff Dam Operational and Capture Data Since Start of Monitoring



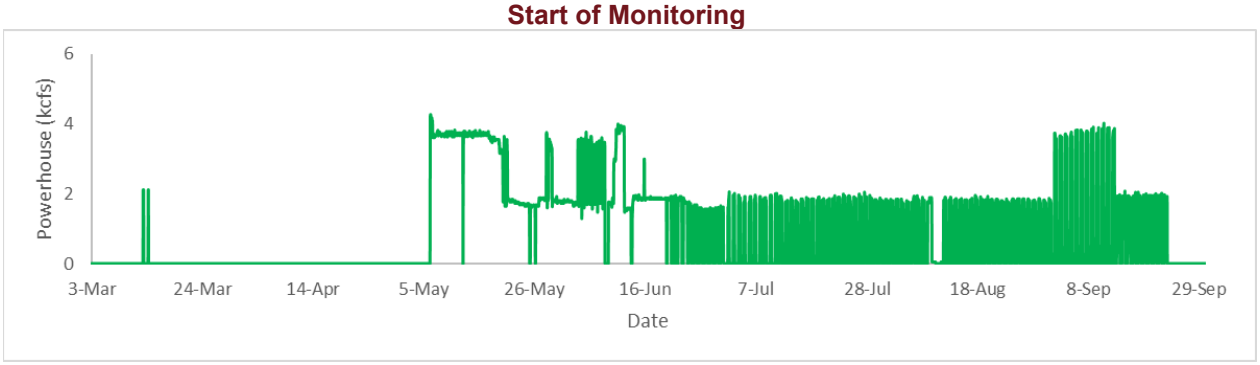


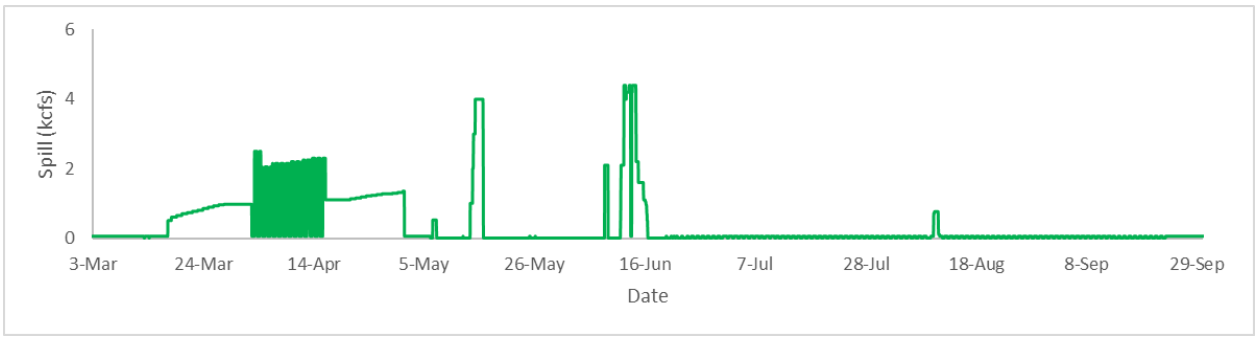


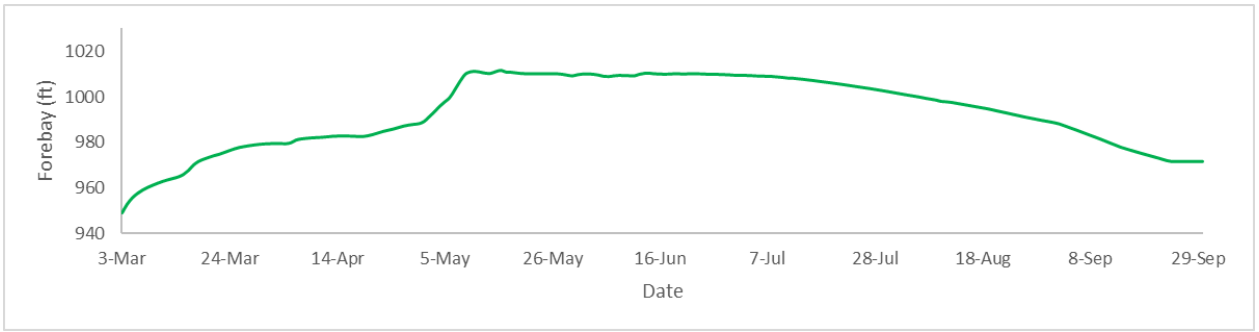


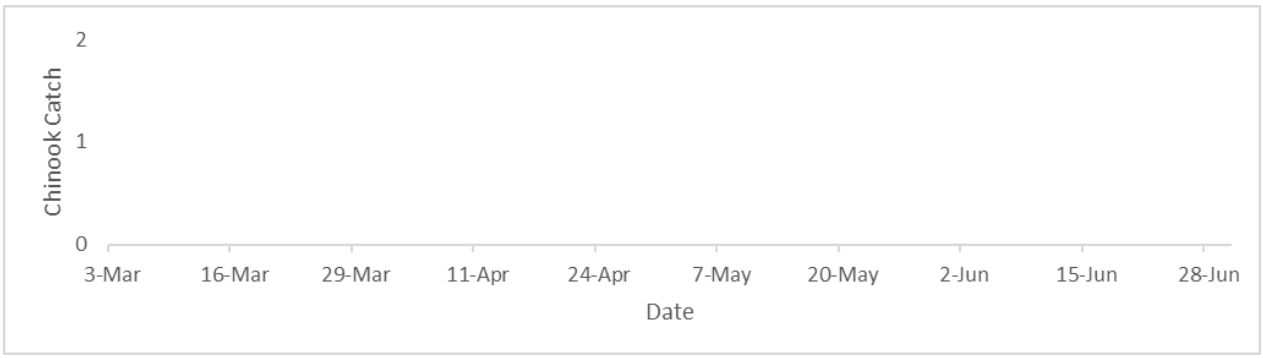


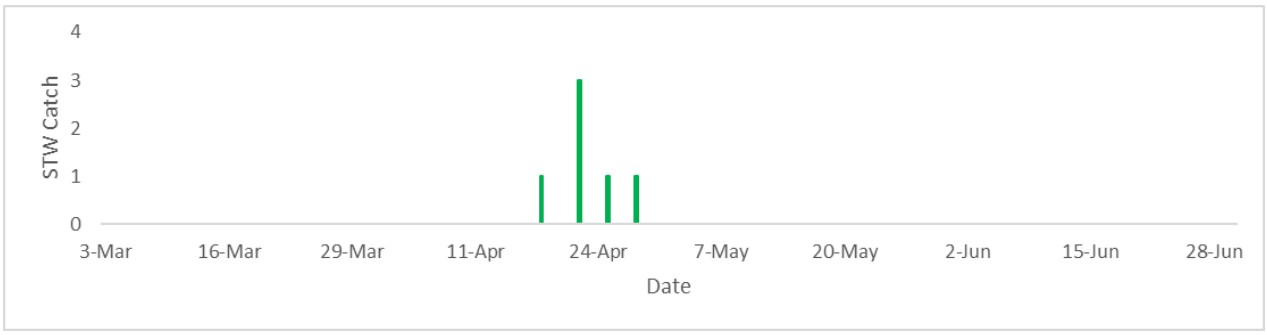
Green Peter Dam Operational and Green Peter Tailrace- Middle Santiam River Capture Data Since Start of Monitoring



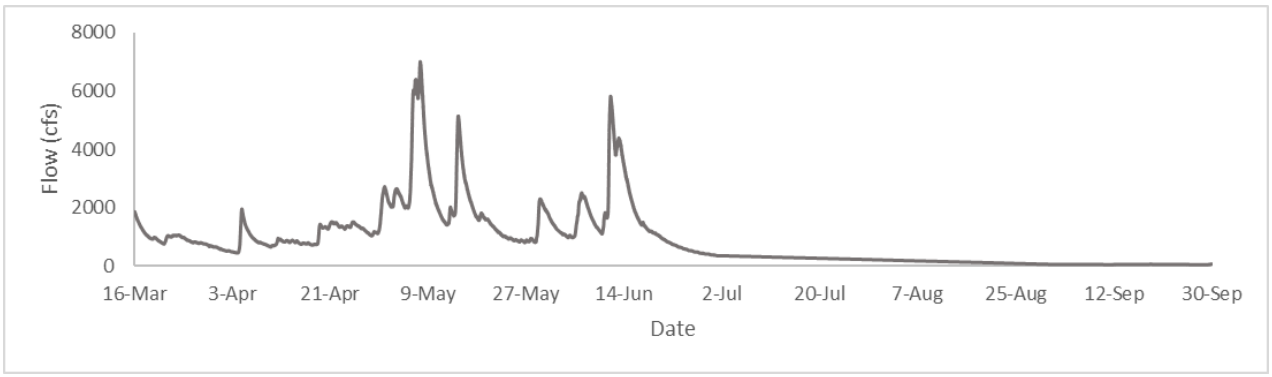


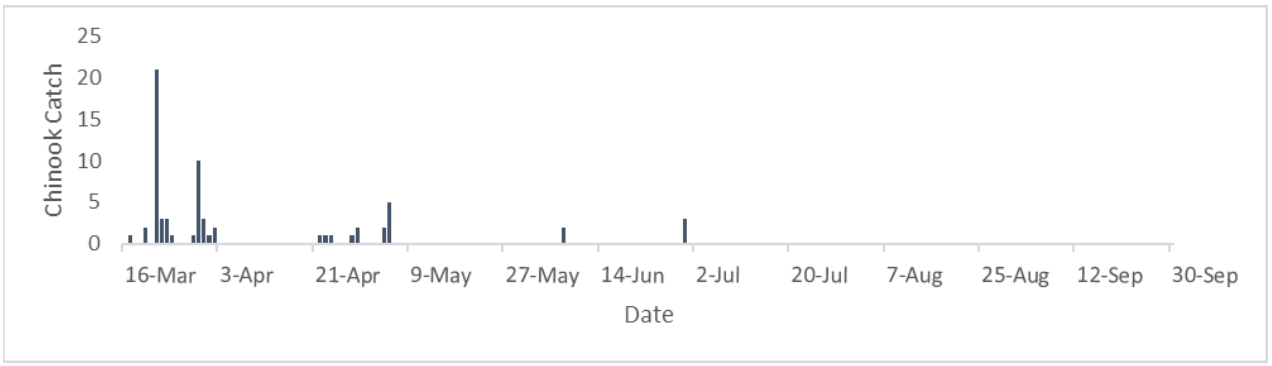


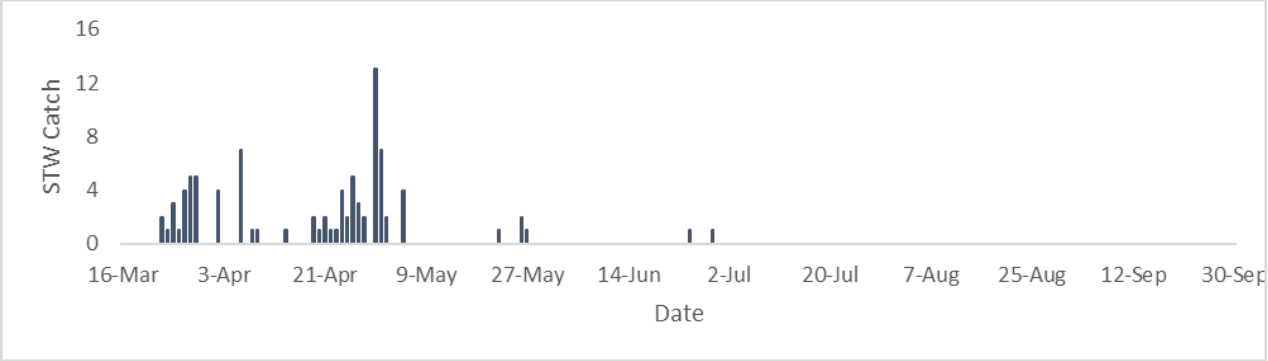




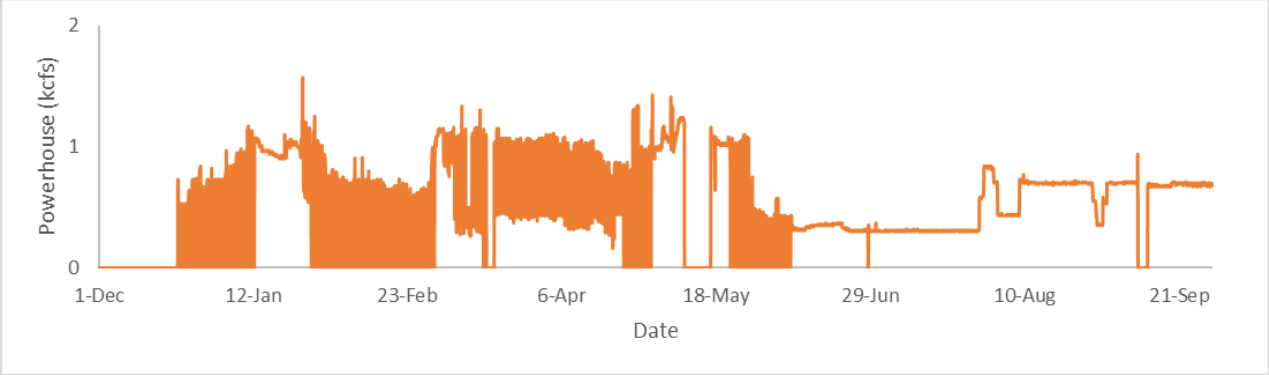
South Santiam River Above Foster Dam Discharge and Foster Dam Head of Reservoir Capture Data

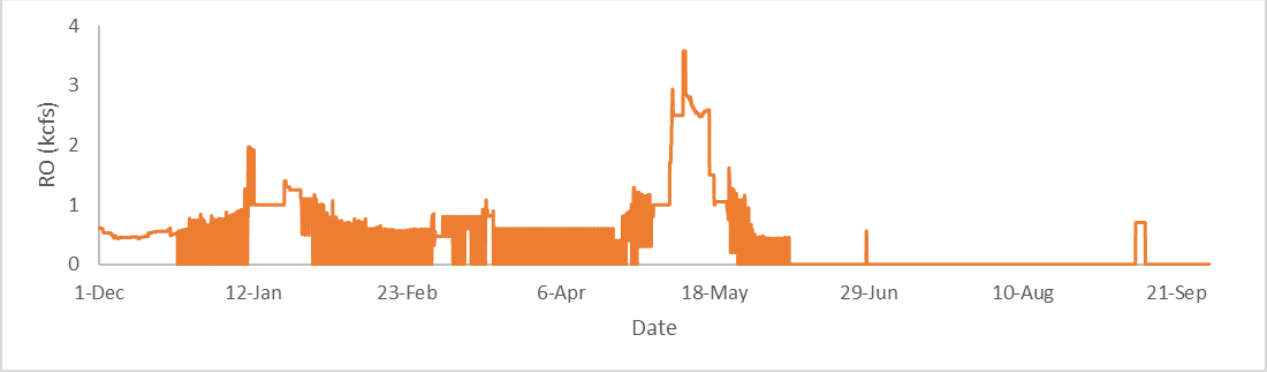


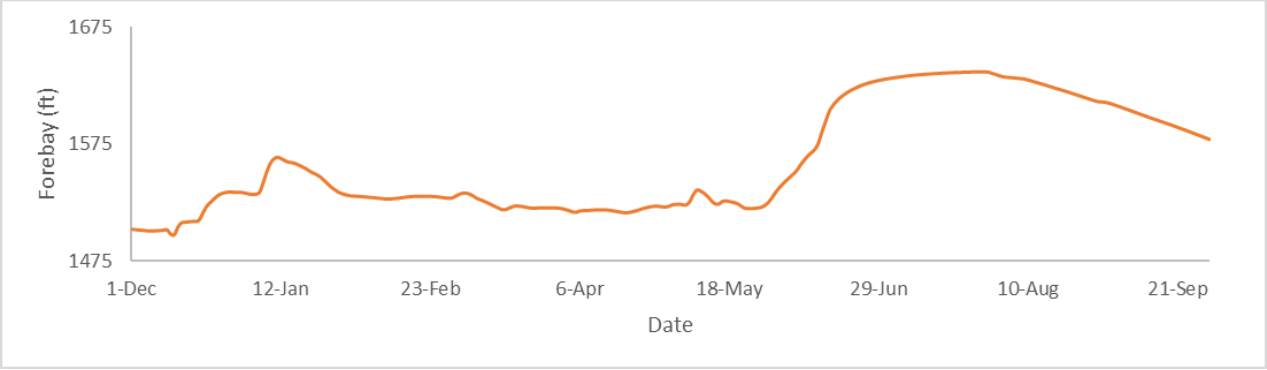


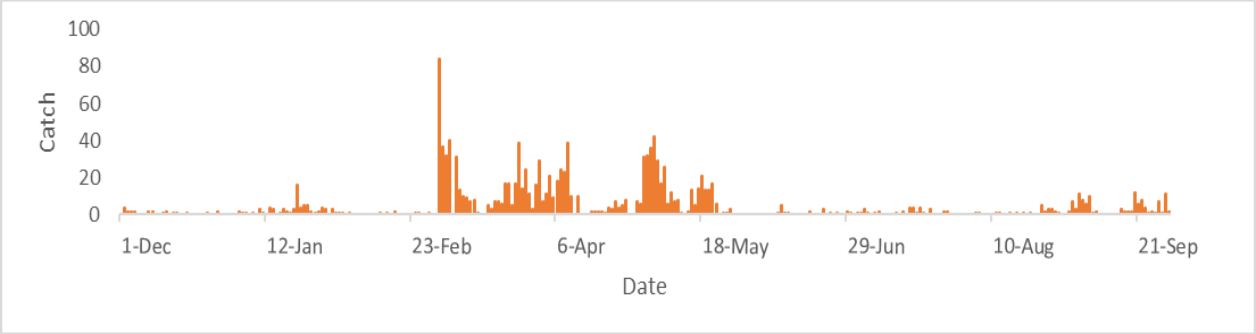


Cougar Dam Operational and Capture Data Since Start of Monitoring

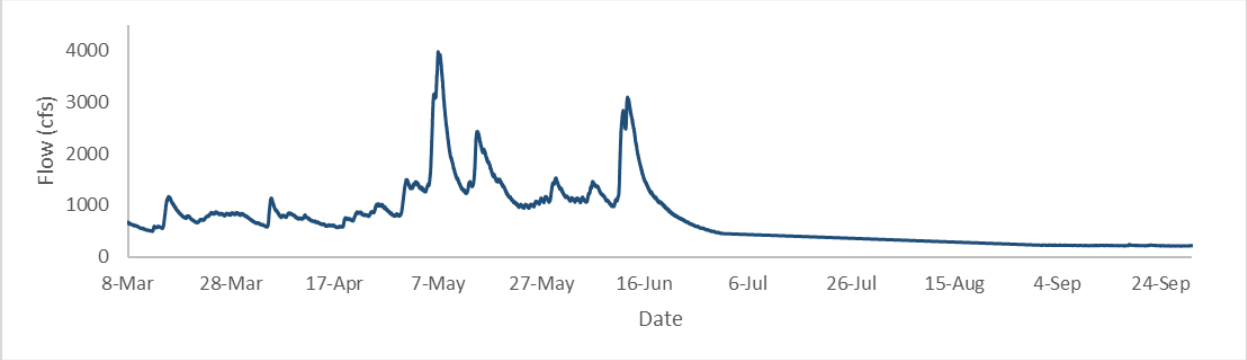




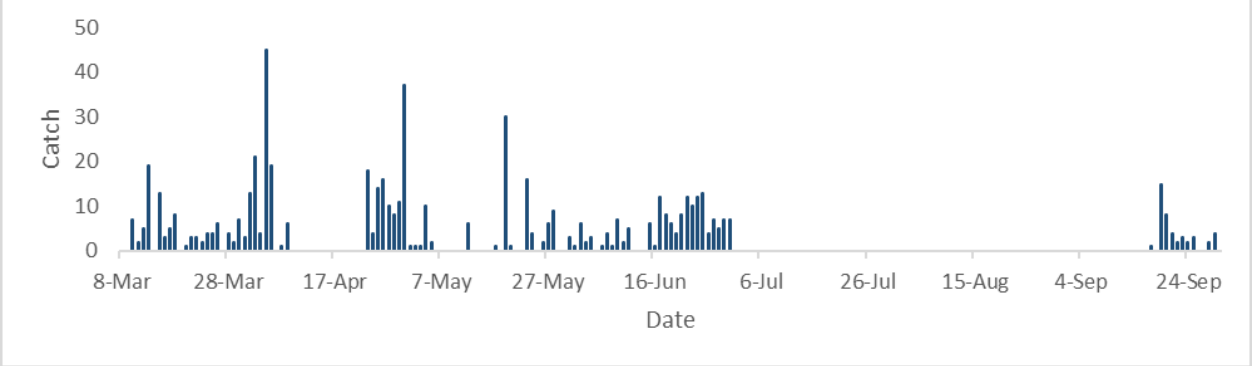




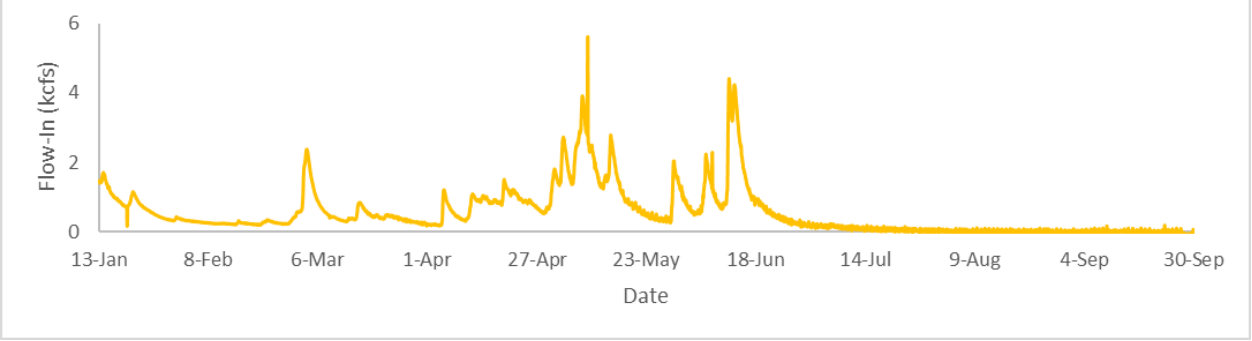
South Fork McKenzie above Cougar Dam Discharge and Cougar Dam Head of Reservoir Capture Data Since Start of Monitoring

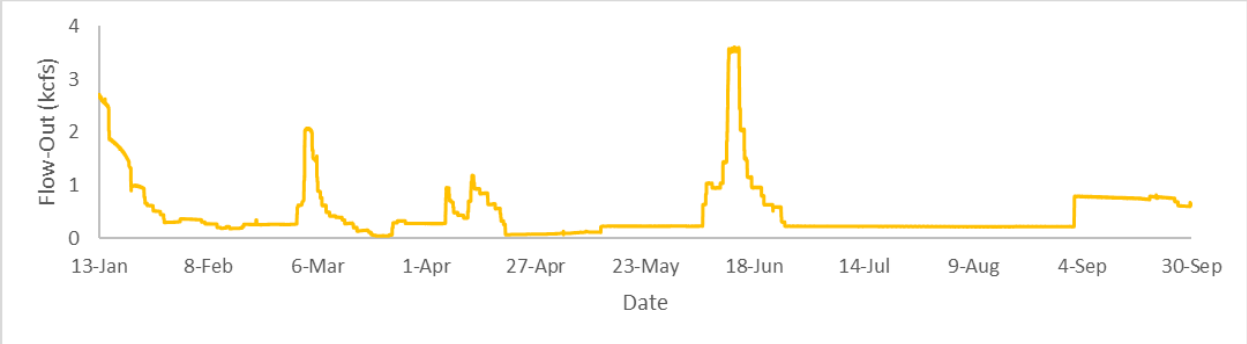


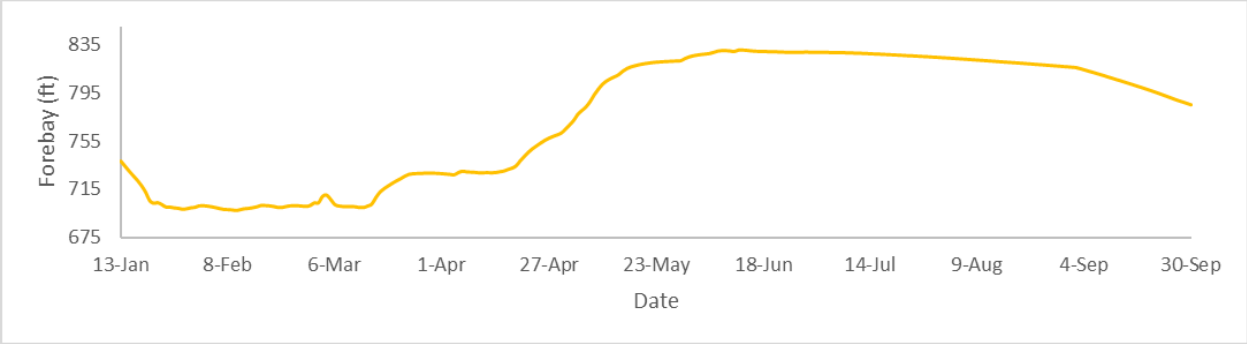
Note: Discharge data was taken from USGS gauge site number 14159200, 250 meters upstream.



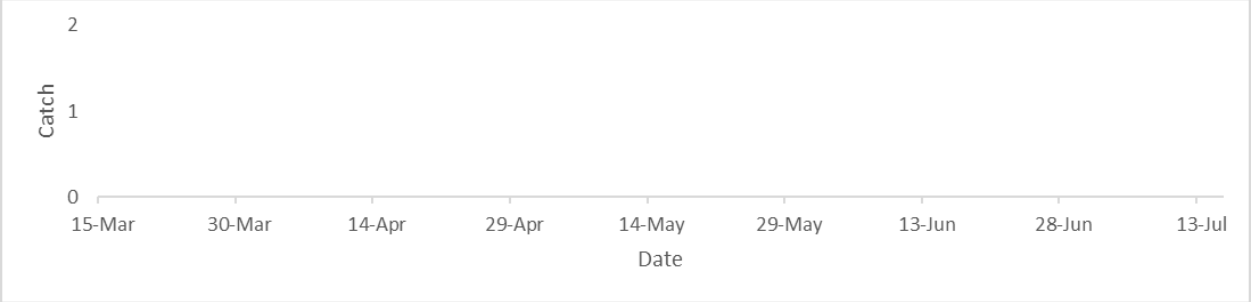
Fall Creek Dam Tailrace Operational and Capture Data Since Start of Monitoring



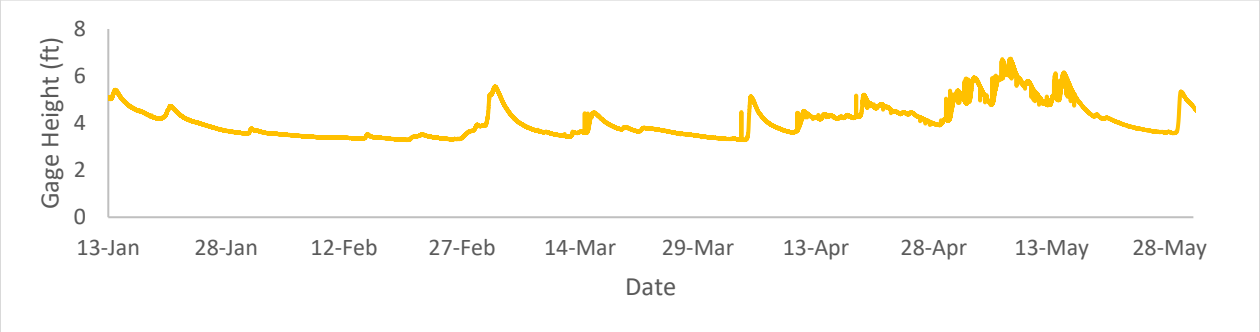




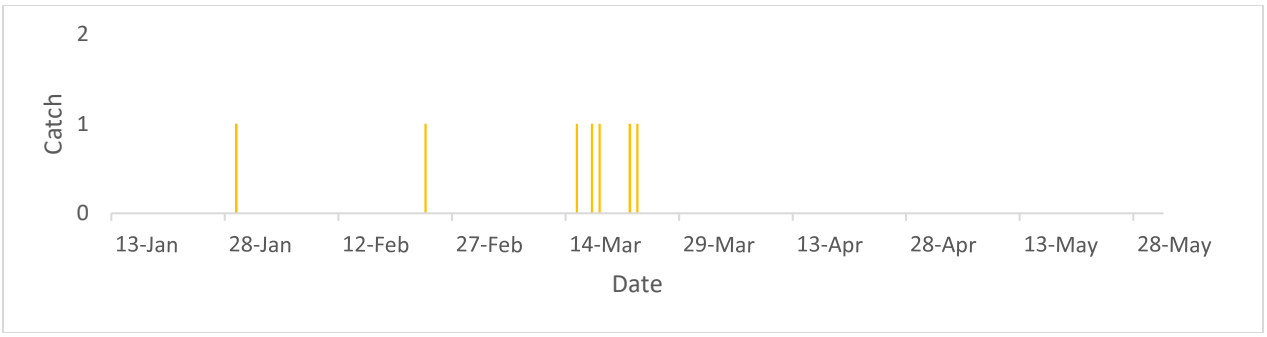
Note: Operational data was being tracked for Fall Creek Head of Reservoir site prior to initiation of Fall Creek Dam monitoring.



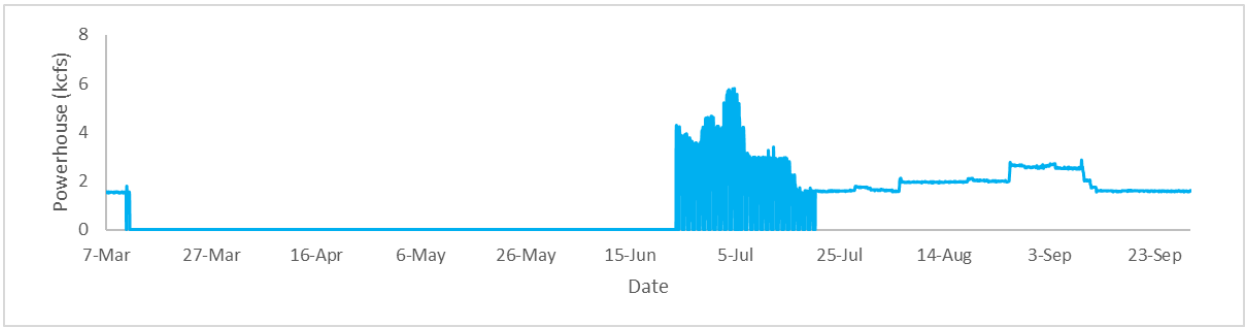
Fall Creek Head of Reservoir Operational and Capture Data Since Start of Monitoring

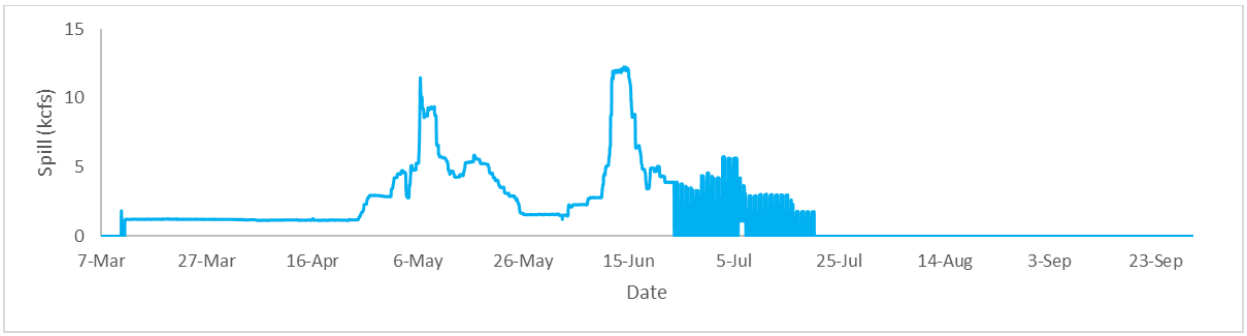


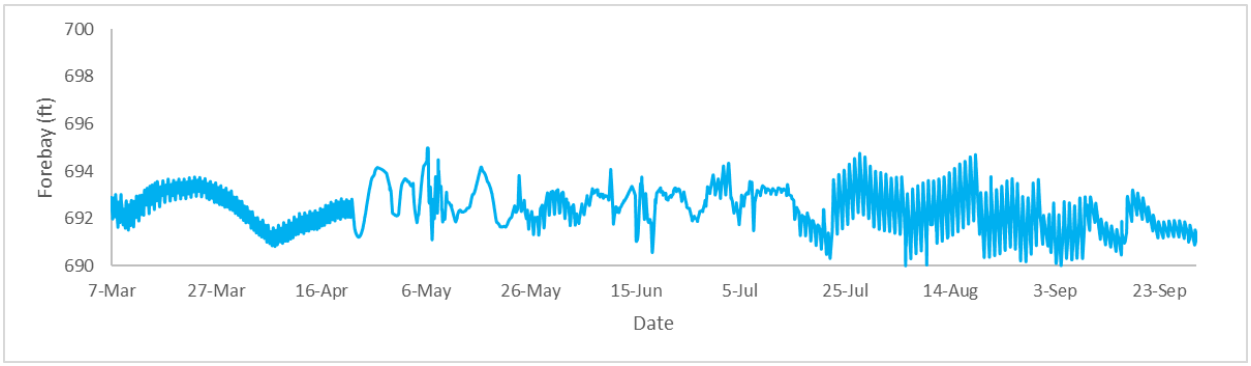
Note: Gauge height data was taken from USGS stream gauge number 14150290, 1.2 rkms downstream.

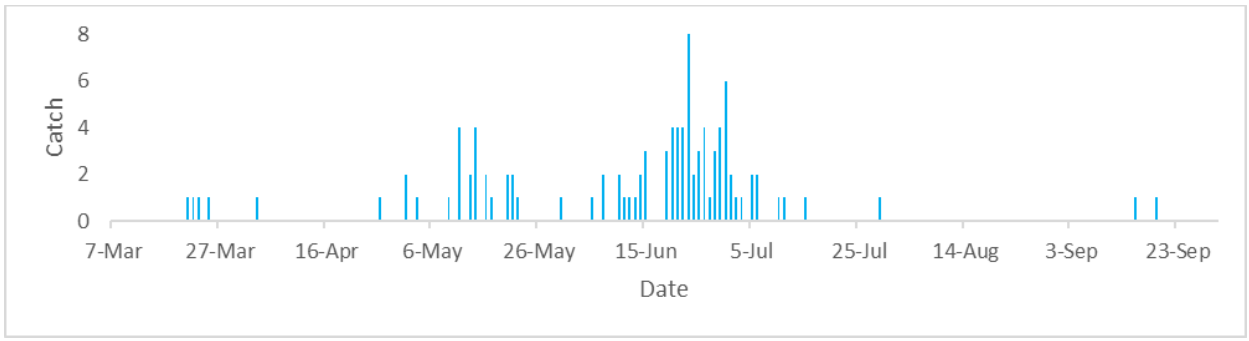


Dexter Dam Operational and Capture Data Since Start of Monitoring

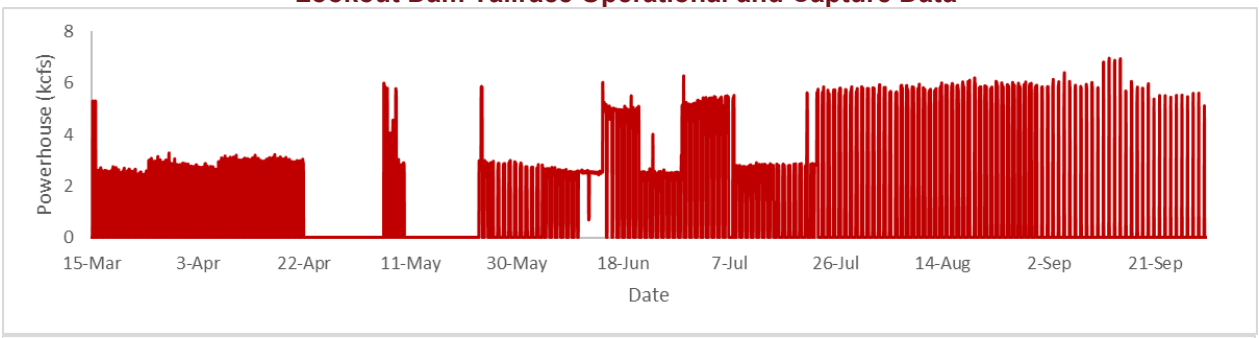


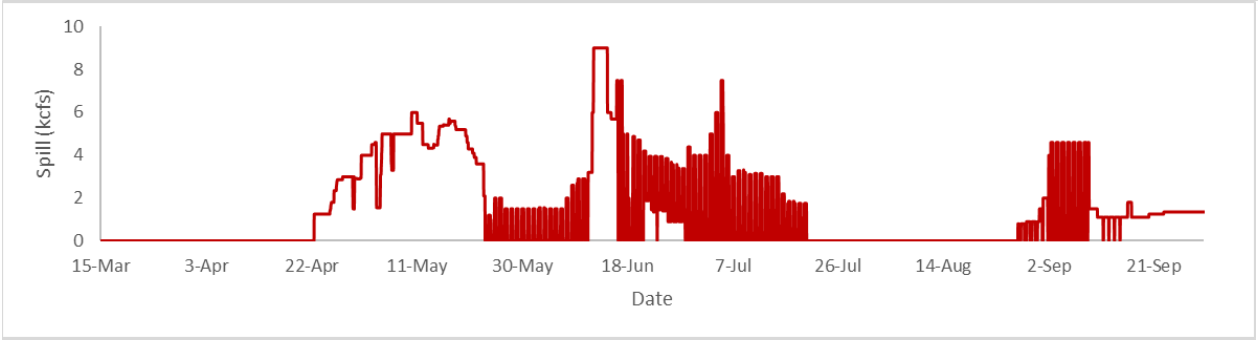


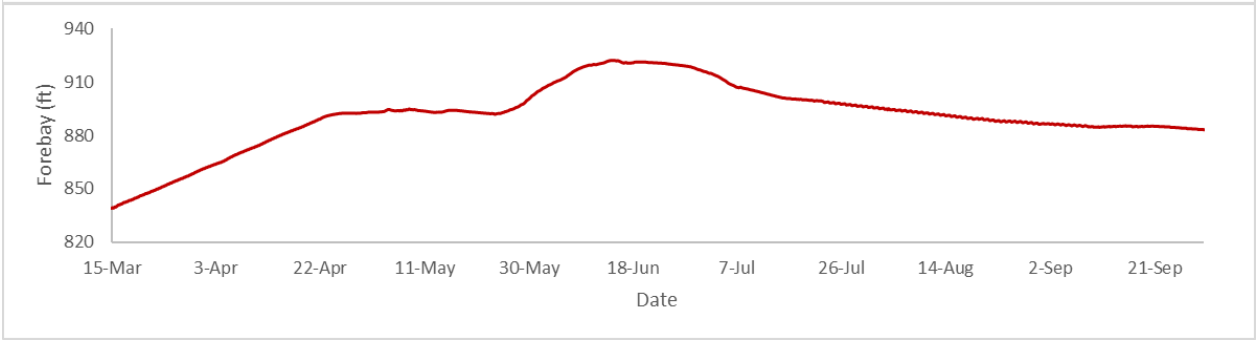


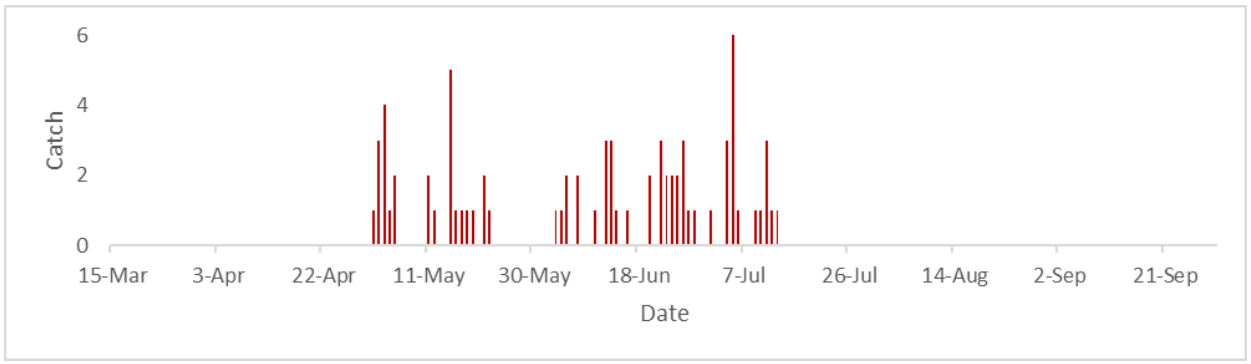


Lookout Dam Tailrace Operational and Capture Data

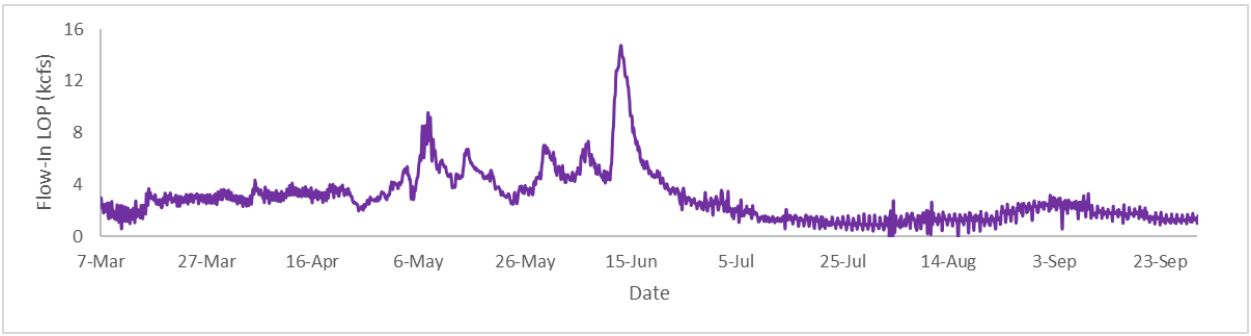


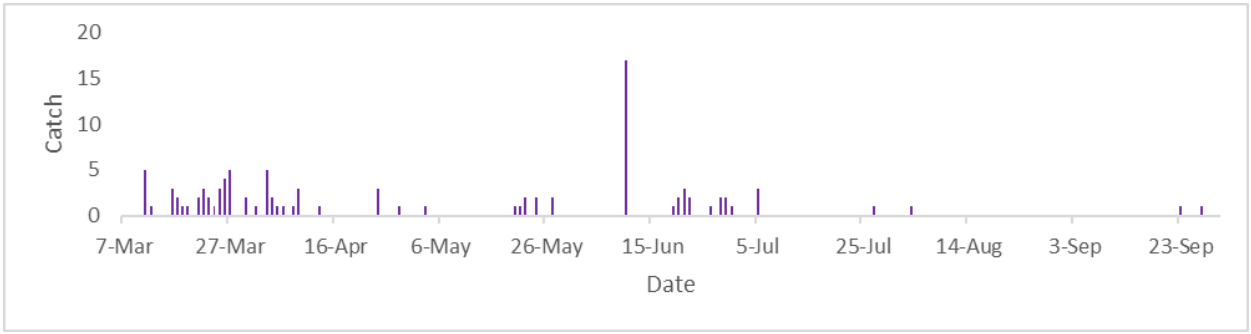




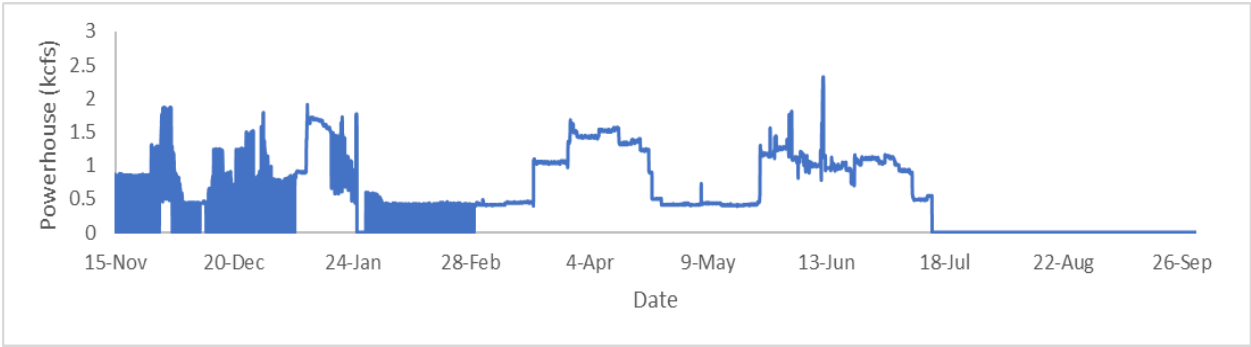


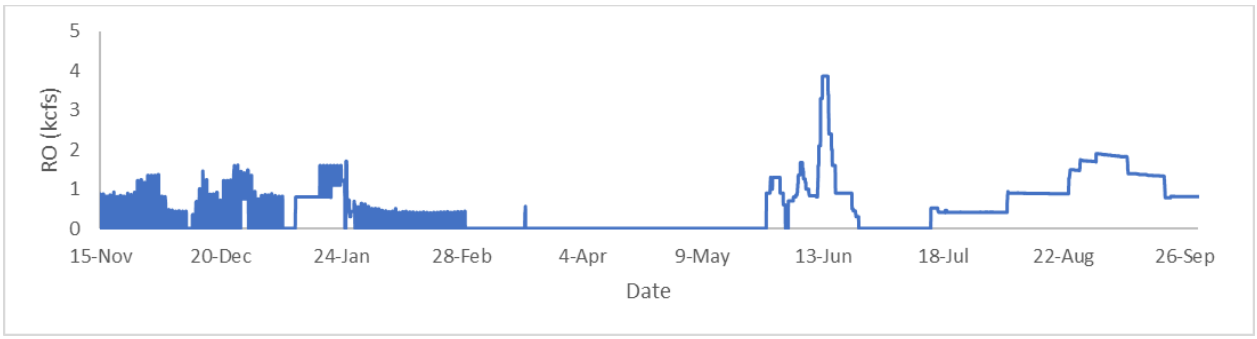
Lookout Point Head of Reservoir Operational and Capture Data Since Start of Monitoring

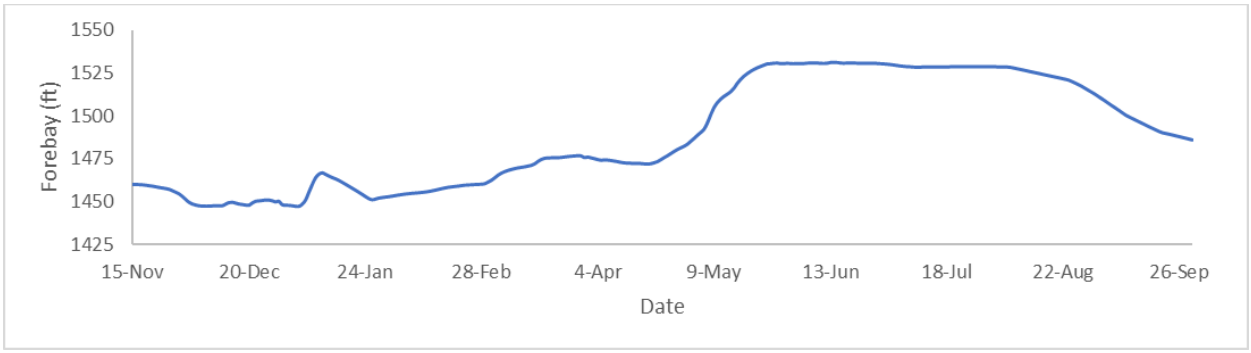




Hills Creek Dam Operational and Capture Data Since Start of Monitoring




RO (kcfs)
5
4
3
2
1
0
15-Nov
20-Dec
24-Jan
28-Feb
4-Apr
9-May
13-Jun
18-Jul
22-Aug
26-Sep
Date


Forebay (ft)
1550
1525
1500
1475
1450
1425
15-Nov
20-Dec
24-Jan
28-Feb
4-Apr
9-May
13-Jun
18-Jul
22-Aug
26-Sep
Date


Catch
8
6
4
2
0
15-Nov
20-Dec
24-Jan
28-Feb
4-Apr
9-May
13-Jun
18-Jul
22-Aug
26-Sep
Date

Appendix C

Hills Creek Trapping Efficiency 1/6/2022

Hills Creek Dam	Release #	Recapture #	Capture Efficiency
PH Route	596	20	3.36% (20/596)
RO Trap	RO Route-605	13	2.15% (13/605)
	PH Route-592	5	0.84% (5/592)

*Live fish captured at the PH trap are released just downstream of the PH trap, upstream of the RO trap and therefore retained in the capture efficiency estimates for the RO Trap if they arrive in the lower trap.
*Any dead fish captured at the PH trap are excluded from the RO trap capture efficiency estimate as they are not alive at time of re-release.

Cougar Dam	Release #	Recapture #	Capture Efficiency
PH Route	405	40	9.88% (40/405)
RO Route	410	28	6.83% (28/410)

Dexter Dam	Release #	Recapture #	Capture Efficiency
Spill	988	2	0.2% (2/988)
Powerhouse	N/A	N/A	N/A

Green Peter Dam Tailrace- Middle Santiam	Release #	Recapture #	Capture Efficiency

8ft Trap	643	4	0.62% (4/643)

Big Cliff Dam	Release #	Recapture #	Capture Efficiency
8ft Trap	996	40	4.01% (40/996)

Cougar Dam Head of Reservoir	Release #	Recapture #	Capture Efficiency
5ft trap	806	41	5.1% (41/806)

Cougar Dam Head of Reservoir	Release #	Recapture #	Capture Efficiency
5ft trap	515	7	1.4% (7/515)

Cougar Dam	Release #	Recapture #	Capture Efficiency
PH Route	357	62	17.37% (62/357)
RO Route	378	21	5.56% (21/378)

Dexter Dam	Release #	Recapture #	Capture Efficiency
Spill	1000	43	4.3% (43/1000)
Powerhouse	N/A	N/A	N/A

Lookout Point Head of Reservoir	Release #	Recapture #	Capture Efficiency
04/05/2022	993	53	5.3% (53/993)

04/14/2022	989	19	1.9% (19/989)

Fall Creek Dam	Release #	Recapture #	Capture Efficiency
RO	518	11	2.1% (11/518)

Fall Creek Dam	Release #	Recapture #	Capture Efficiency
RO	513	0	0% (0/513)

Cougar Dam	Release #	Recapture #	Capture Efficiency
RO Route	993	63	6.34% (63/993)

Dexter Dam	Release #	Recapture #	Capture Efficiency
Spill	1019	67	6.6% (67/1,019)
Powerhouse	N/A	N/A	N/A

Lookout Point Head of Reservoir	Release #	Recapture #	Capture Efficiency
05/24/2022	1007	125	12.4% (125/1007)

Big Cliff Dam	Release #	Recapture #	Capture Efficiency
8ft Trap	1000	21	2.1% (21/1000)

Cougar Dam	Release #	Recapture #	Capture Efficiency
PH Route	500	148	29.6% (148/500)

Appendix D

Summary of Project PIT Tagged Fish for Reporting Period

Site	Trap	# of PIT Tagged Fish
Big Cliff Dam	8 ft	0
Foster Dam Head of Reservoir- South Santiam	5 ft	0
Cougar Dam	PWR	0
Cougar Dam	RO	0
Cougar Dam Head of Reservoir	5 ft	41
Green Peter Tailrace- Middle Santiam	8 ft	0
Dexter Dam Tailrace	5 ft	0
Lookout Point Head of Reservoir	5 ft	1
Lookout Dam Tailrace	Spill	0
Lookout Dam Tailrace	PWR	0
Hills Creek Dam Tailrace	PWR	0
Hills Creek Dam Tailrace	RO	2

To Date Summary of Captured Fish Containing PIT Tags

Site	Trap	PIT Tag #	Date	Species
Cougar Dam	RO	3DD.0077780789	1/8/2022	Chinook
Cougar Dam	RO	384.36F2B2C55F	1/14/2022	Chinook
Cougar Dam	PH	3DD.003DA4DC74	3/3/2022	Chinook
Cougar Dam	PH	3DD.003E14CA70	3/4/2022	Chinook
Cougar Dam	PH	384.36F2B2C5D2	3/4/2022	Chinook

Cougar Dam	PH	3DD.003E14CC20	3/5/2022	Chinook
Cougar Dam	PH	3DD.003E14C9D6	3/6/2022	Chinook
Cougar Dam	PH	3DD.003E14CD8D	3/8/2022	Chinook
Cougar Dam	RO	3DD.003BD59645	4/7/2022	Chinook
Cougar Dam	PH	3DD.003BD21883	7/23/2022	O. mykiss
Cougar Dam	PH	3DD.003BD21883	7/26/2022	O. mykiss
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE1849	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE22CE	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2AAF	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE1885	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE24AD	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2293	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE26D4	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2422	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2AB1	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE227B	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE22B9	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE24D6	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE22B8	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE223A	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE18C0	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE1965	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE224D	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE242B	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2464	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE244B	9/23/2022	Chinook

Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2443	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE26F9	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2449	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2519	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2517	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2AF3	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE18D2	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE18E3	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE185B	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE223F	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE270D	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE16F5	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2284	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE175F	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2252	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE223B	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE240E	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE26D0	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2253	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2489	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE244E	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE190D	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE18D8	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2AC4	9/23/2022	Chinook

Cougar Dam Head of Reservoir	5 ft	3DD.003BEE176A	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE1917	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2AEF	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE192E	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2266	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE1916	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE16D7	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2216	9/24/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE1741	9/24/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2AFB	9/24/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE16BC	9/25/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE26CC	9/27/2022	Chinook

List of EAS PIT Tagged Fish for Reporting Period

Site	Trap	Pit Tag #	Date	Species
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2643	9/17/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2A58	9/19/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2A41	9/19/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2A3C	9/19/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2A68	9/19/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2A3B	9/19/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2A5C	9/19/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2A80	9/19/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2A78	9/19/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2A4E	9/19/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2A77	9/19/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2A9A	9/19/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2A97	9/19/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2A87	9/19/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2A84	9/19/2022	Chinook

Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2A78	9/20/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2618	9/20/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE25F4	9/20/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE260C	9/20/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE25F7	9/20/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2640	9/20/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE25FA	9/20/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2A9A	9/20/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2631	9/21/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE261F	9/21/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE25F0	9/21/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE264C	9/21/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2C3B	9/22/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2C4F	9/22/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2C73	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2C92	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2C8D	9/23/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE262A	9/24/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE262F	9/24/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE16A9	9/25/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE165F	9/25/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2A8A	9/28/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2A57	9/29/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2A56	9/29/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2A89	9/29/2022	Chinook
Cougar Dam Head of Reservoir	5 ft	3DD.003BEE2A7B	9/29/2022	Chinook
Hills Creek Dam	RO	3DD.003BEE2C63	9/18/2022	Chinook
Hills Creek Dam	RO	3DD.003BEE2C3A	9/19/2022	Chinook
Lookout Point Head of Reservoir	5 ft	3DD.003BEE1675	9/27/2022	Chinook