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Report Period: May 16 to May 31, 2022

Report No.: 2022 Willamette RST Bi-Weekly Report 05/16 to 05/31 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	2/15/2022	292
Big Cliff Dam RST	Operation	3/15/2022	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
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
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	1/19/2022	1
Cougar Dam	Trap Efficiency Release (735 Fish, ~365 per route)	04/20/2022	4/20/2022	1
Cougar Dam	Trap Efficiency Release (993 Fish, RO route)	05/15/2022	05/15/2022	1
Cougar Dam Head of Reservoir	Highline and Trap Install	03/7/2022	3/7/2022	1
Cougar Dam Head of Reservoir	Operation	03/8/2022	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
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	03/23/2022	03/23/2022	1

	(988 Fish)			
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
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
Fall Creek Dam Tailrace RST	Operation	03/15/2022	07/15/2022	123
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

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 being operated at the following nine locations: Big Cliff Dam, Foster Dam Head of Reservoir- South Santiam, Cougar Dam, Cougar Dam Head of Reservoir, Fall Creek Dam Tailrace, Fall Creek Head of Reservoir, Dexter Dam Tailrace, Lookout Dam Tailrace, and Lookout Point Head of Reservoir. The Green Peter Dam Tailrace- Middle Santiam trap was removed on May 12th due to damage incurred to the highline.

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.

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. 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 10.

Figure 1. Big Cliff RST Location

Figure 2. Green Peter Tailrace- Middle Santiam River RST Location

Figure 3. Foster Dam Head of Reservoir- South Santiam RST Location

Figure 4. Cougar Dam RST Locations

Figure 5. Cougar Dam Head of Reservoir RST Location

Figure 6. Fall Creek Dam Tailrace RST Location

Figure 7. Fall Creek Head of Reservoir RST Location

Figure 8. Dexter Dam RST Location

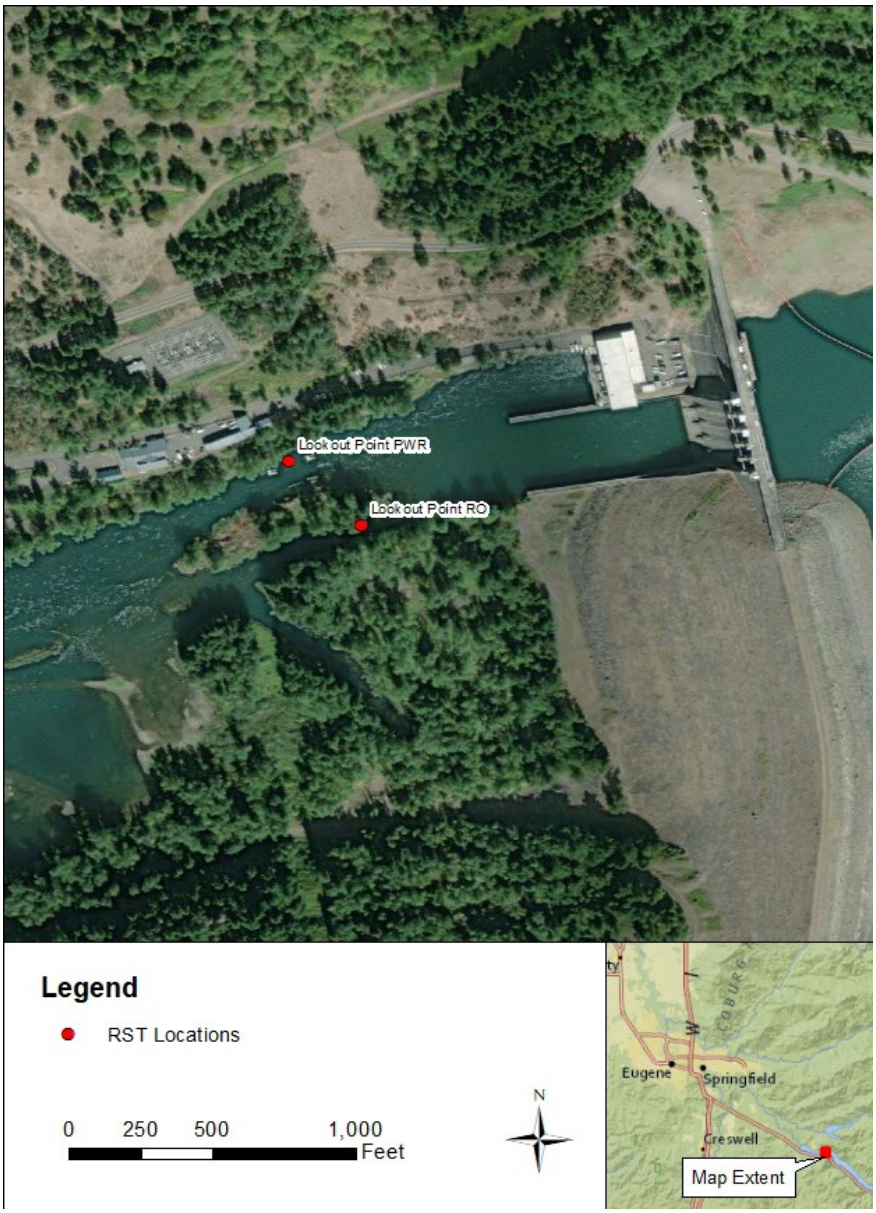


Figure 9. Lookout Point Dam Tailrace RST Location

Figure 10. Lookout Point Head of Reservoir RST Location

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	5/16/2022	5/31/2022	14	141
Green Peter Tailrace- Middle Santiam River	3/2/2022	5/16/2022	5/31/2022	0	67
Foster Dam Head of Reservoir- South Santiam	3/16/2022	5/16/2022	5/31/2022	15	72
Cougar Dam PH	12/1/2021	5/16/2022	5/31/2022	16	182
Cougar Dam RO	12/1/2021	5/16/2022	5/31/2022	16	181
Cougar Dam Head of Reservoir	3/7/2022	5/16/2022	5/31/2022	15	75
Fall Creek Dam Tailrace*	3/15/2022	5/16/2022	5/31/2022	16	78
Fall Creek Head of Reservoir	1/13/2022	5/16/2022	5/31/2022	15	135
Dexter Dam Tailrace	3/7/2022	5/16/2022	5/31/2022	16	85
Lookout Point Dam	3/15/2022	5/16/2022	5/31/2022	16	74
Lookout Point Head of Reservoir	3/10/2022	5/16/2022	5/31/2022	13	85

*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	45	21	496	61
Big Cliff Dam	STW	2	0	10	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	61	0
Foster Dam Head of Reservoir- South Santiam	STW	4	0	88	1
Cougar Dam	CHS	262	63	1080	215
Cougar Dam Head of Reservoir	CHS	72	23	422	64
Fall Creek Dam Tailrace	CHS	0	0	0	0
Fall Creek Head of Reservoir	CHS	0	0	7	1
Dexter Dam Tailrace	CHS	9	67	25	112
Lookout Point Dam	CHS	7	0	28	2
Lookout Point_Head of Reservoir	CHS	8	125	65	197

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. The RST had to be temporarily removed from 6 May 2022 to 13 May 2022 due to high flows at the site that could have damaged the trap.

Target Species

This reporting period began on May 16 and ended on May 31. There were a total of 45 Chinook salmon (CHS) and 2 Winter Steelhead (STW) captured during the 16-day sampling period (Figure 11). Sampling duration was 87.5% for the RST. The trap was raised from the start of the period until the 18th when flows decreased and allowed for safe sampling. 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 12 shows length frequency data to-date.

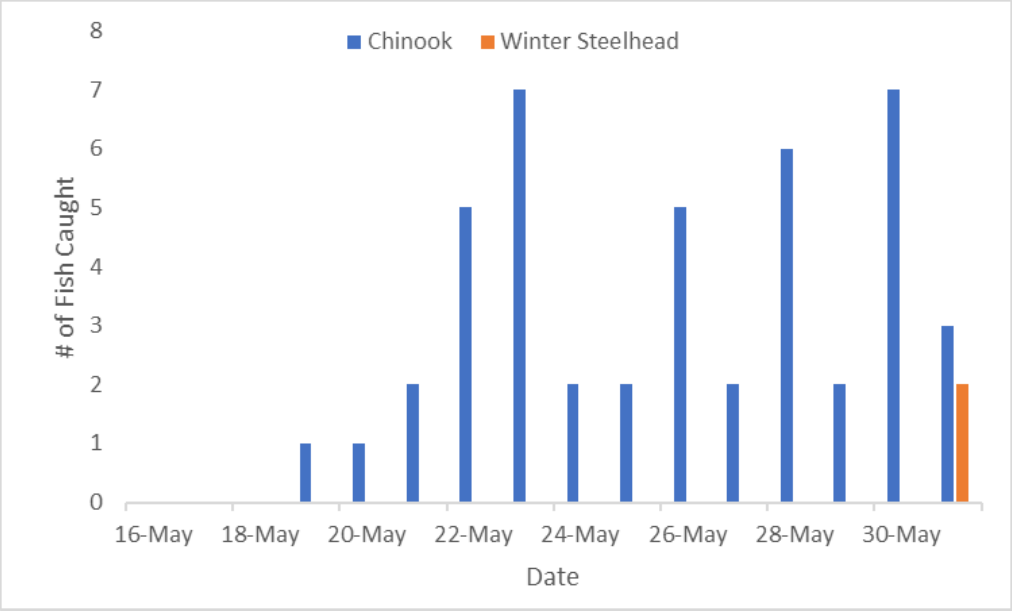


Figure 11. Chinook and Winter Steelhead Captured per day 05/16/2022 to 05/31/2022 (Big Cliff)

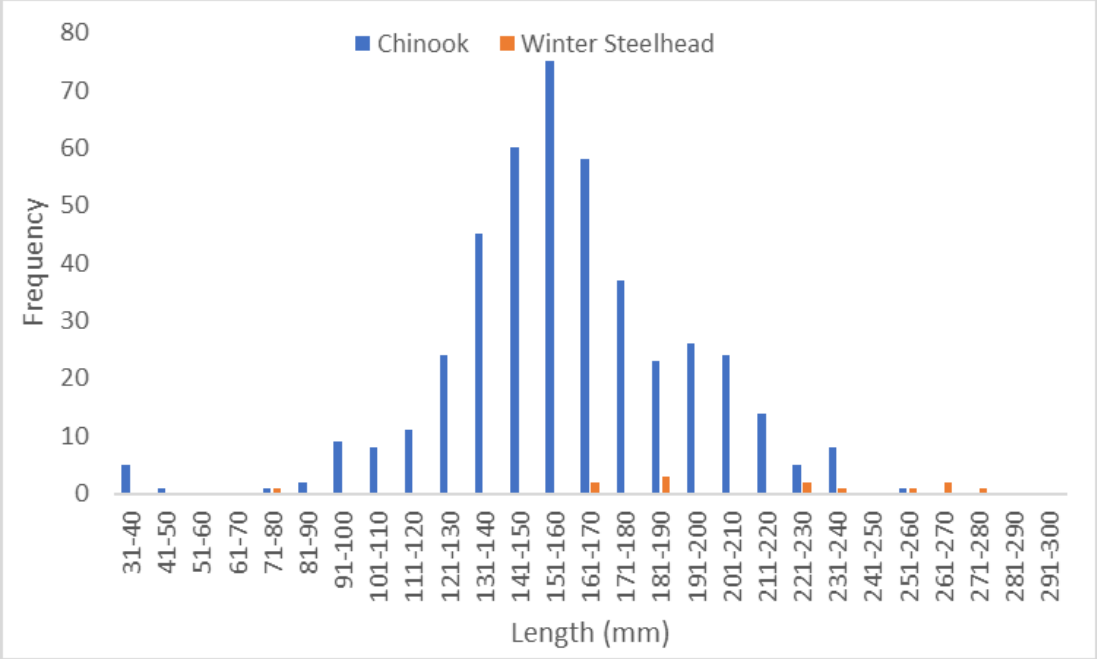


*Figure does not include fish without heads (8)

Figure 12. Length Frequency of Juvenile Chinook and Winter Steelhead Sampled Season To-Date (Big Cliff)

Trapping Efficiency

A total of 1000 juvenile hatchery Chinook (parr) were bismarck brown dyed, adipose clipped and released on 05/25/2022 below Big Cliff Dam. A total of 21 fish were recaptured in the 8ft trap. Trapping efficiency was 2.1%.

Of the 21 fish recaptured, only 1 fish had injuries present. It displayed minor head injury. All other fish were unharmed.

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

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

To-Date											
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*			
					Min	Max	Mean	Min	Max	Mean	
Big Cliff	PWR	CHS	Fry	6	31	46	35.3	1.4	1.4	1.4	
		CHS	Parr	19	78	130	101.2	6.1	20.1	11.9	
		CHS	Smolt	421	108	260	163.6	11.7	180.6	45.8	
		STW	Parr	1	75	75	75	5.2	5.2	5.2	
		STW	Smolt	11	161	280	216.2	38.4	230.5	100.0	

*Fish that were missing heads are not included in length and weight calculations (8).

May 16-31, 2022											
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*			
					Min	Max	Mean	Min	Max	Mean	
Big Cliff	PWR	CHS	Fry	4	41	46	36.8	1.4	1.4	1.4	
		CHS	Parr	0	N/A	N/A	N/A	N/A	N/A	N/A	
		CHS	Smolt	41	119	198	153.1	15.7	83.4	37.3	
		STW	Parr	0	N/A	N/A	N/A	N/A	N/A	N/A	
		STW	Smolt	2	188	226	207	57.7	99.9	78.8	

*Fish that were missing heads are not included in length and weight calculations (1).

24-Hour Post Collection Holding Trial

39 Spring Chinook and 1 Winter Steelhead were captured during the current reporting period and held for 24 hours. 2 Chinook (5.1%) and 0 Winter Steelhead (0%) died in holding.

Injuries and Copepod Infection

Partial descaling <20% was observed in 31 of the 45 Chinook captured (68.9%), 5 displayed descaling >20% (11.1%), 23 displayed body injury (51.1%), 7 had eye injury (15.6%), 32 had copepods present in the branchial cavity (71.1%) and 10 had copepods on fins (22.2%). Three Chinook displayed gas bubble disease (6.7%) (level 1). There were 5 mortalities (11.1%).

Partial descaling <20% was observed in 1 of the 2 Winter Steelhead captured (50%) and 1 displayed descaling >20% (50%), both displayed body injury (100%), 0 had eye injury (0%), 0 had copepods present in the branchial cavity (0%) and 1 had copepods on fins (50%). There was 1 mortality (50%).

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	45	31	5	23	7	32	10	5
Big Cliff Dam	Winter Steelhead	2	1	1	2	0	0	1	1

Non-Target Species

21 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	7	1	24	5
Brook Lamprey	0	0	0	0
Bullhead	0	0	1	0
Crappie	0	0	0	0
Longnose Dace	0	0	0	0
Kokanee	4	1	108	39
Red-Sided Shiner	0	0	0	0
Sculpin	0	0	0	0
Spotted Bass	0	0	0	0
Sucker	0	0	0	0
Whitefish	0	0	4	0
Cutthroat	0	0	3	0
O. mykiss (clipped)	1	1	2	1
Pumpkinseed	9	0	12	2
Unknown	0	0	2	0
Totals	**21**	**3**	**152**	**47**

Stream Statistics

Basic stream statistics at the Big Cliff Dam site were calculated from data downloaded from U.S. Geological Survey stream gage numbers 14181410 and 14181500. Gage height (feet) is the only metric provided at gage 14181410. Total dissolved gas (TDG) saturation data was received from gage 14181500, 1 rkm downstream of the trap. During the reporting period, daily maximum values for instantaneous gage height ranged from 1,111.5 feet to 1,115.3 feet (mean: 1,113.0 feet). Figure 13 shows instantaneous gage height.

Total dissolved gas saturation ranged from 103 to 124% during the reporting period (mean: 115.1%). Figure 14 shows total dissolved gas saturation.

Stream temperatures were recorded every 2 hours for the length of the report period at the RST (Figure 15). Temperature probes operated normally throughout this reporting period.

Flows through the Powerhouse and Spill during the reporting period averaged 3,291.1 and 921 cubic feet per second (cfs), respectively (Figure 16). 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.

	Chinook	Winter Steelhead
Description	**(8 ft)**	**(8 ft)**
Catch	45	2
Effort (hrs)	314.2	314.2
CPUE (fish/hr)	0.143	0.006

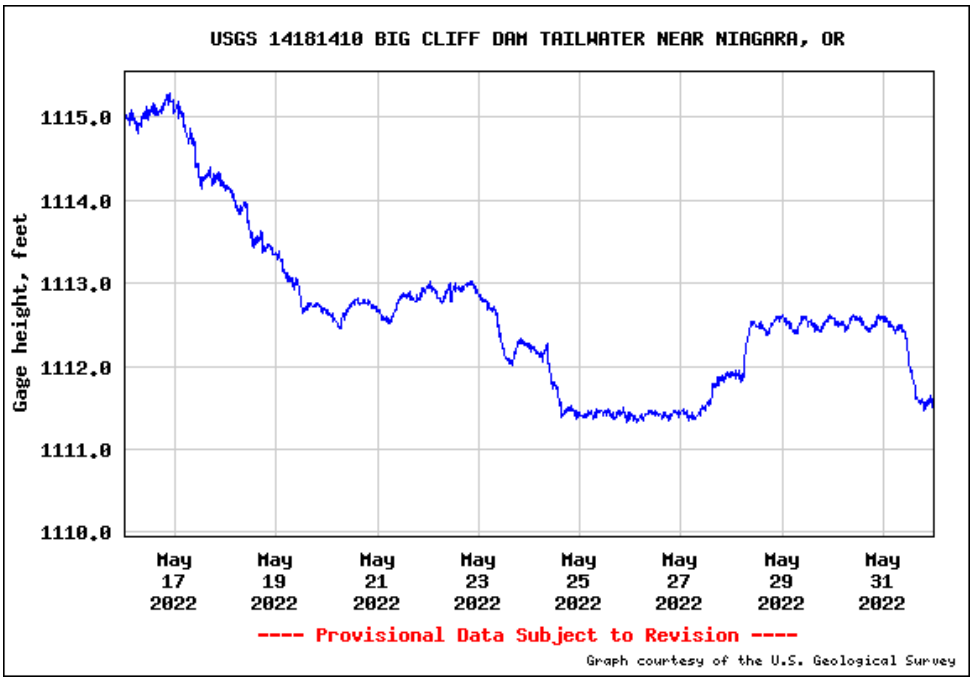


Figure 13. Gage height (ft); below Big Cliff Dam

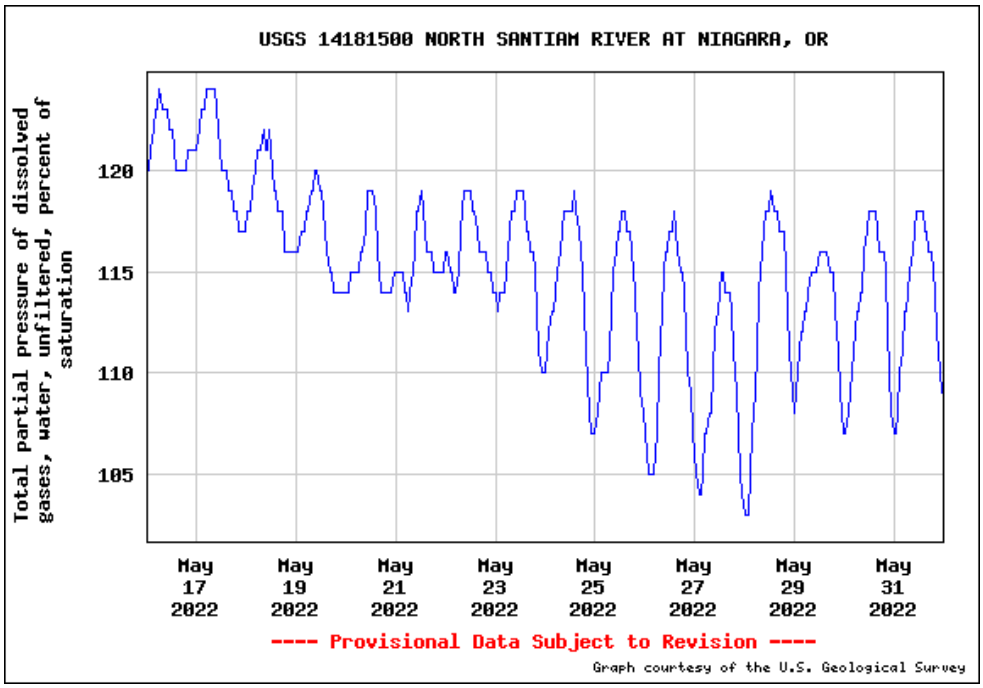


Figure 14. Total Dissolved Gas Saturation (%); below Big Cliff Dam

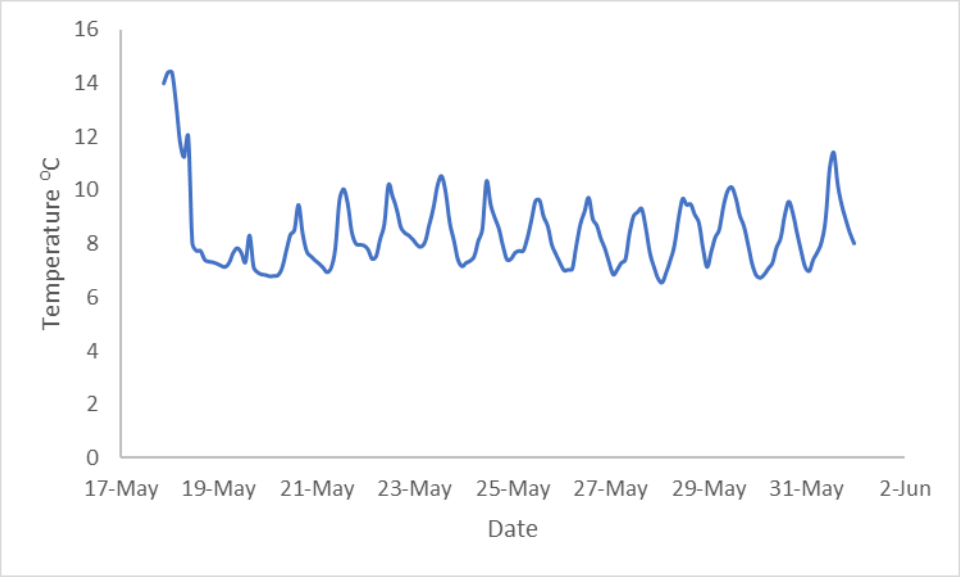


Figure 15. Temperature at RST (Big Cliff Dam)

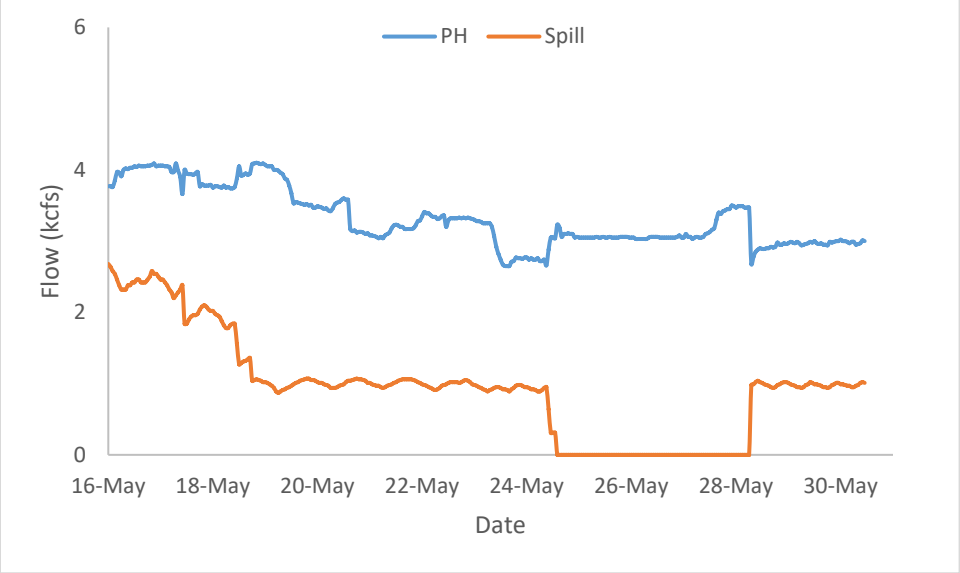


Figure 16. Hourly Flows PWR vs. RO (Big Cliff Dam)

Middle Fork Santiam– Green Peter Tailrace

Target Species

This reporting period began on May 16 and ended on May 31. No Chinook Salmon (CHS) or Winter Steelhead (STW) were captured during the 16-day sampling period (Figure 17) as the trap was removed during the previous reporting period. The trap was raised to the non-sampling position on May 7th due to highline damage after flows were raised to ~4,000 cfs. The RST was removed on May 12th to prevent further damage from expected high flows. Table 8 provides life stage, length, and weight data for all target species that have been caught at the Green Peter Dam site to-date. Figure 18 shows length frequency data to-date.

*Recaptured fish for trapping efficiency trials not included.

Figure 17. Chinook and Winter Steelhead Captured Per Day 05/16/2022 to 05/31/2022 (Green Peter Tailrace- Middle Santiam)

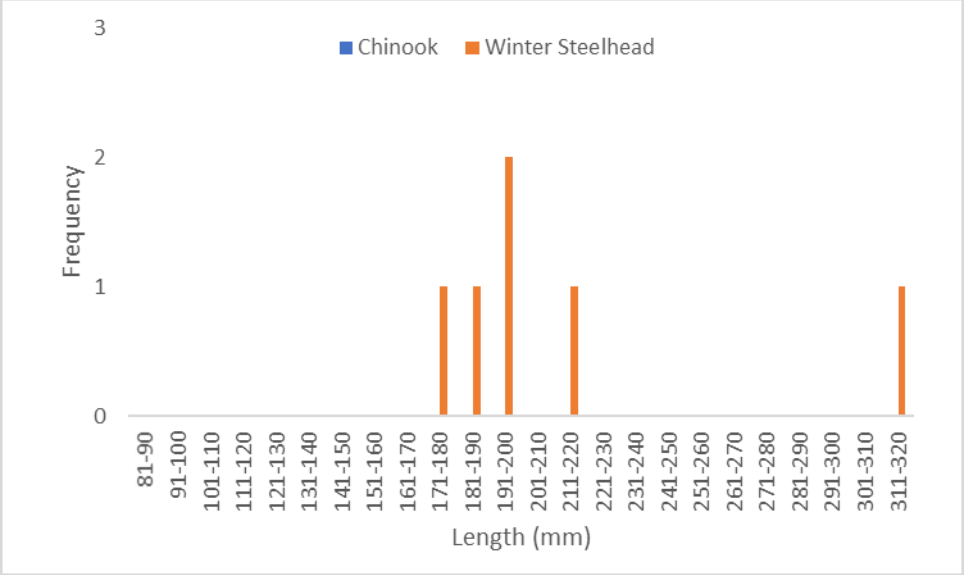


*Figure does not include fish without heads or fish used for trapping efficiency trials.

Figure 18. Length Frequency of Juvenile Chinook and Winter Steelhead Sampled Season To-Date (Green Peter Tailrace- Middle Santiam River)

Trapping Efficiency

A total of 518 juvenile hatchery Chinook (parr) were bismarck brown dyed, adipose clipped and released on 4/30/2022 below Green Peter Dam. A total of 9 fish were recaptured in the 8ft trap on 5/1/2022. Trapping efficiency was 1.74%.

Of the 9 fish recaptured, only 1 fish that was captured had injuries present. The injured fish displayed fin damage. Mt. Hood Environmental staff noted that fish appeared to be in good condition upon retrieval from the hatchery.

Green Peter Dam Tailrace- Middle Santiam	Release #	Recapture #	Capture Efficiency
8ft Trap	518	9	1.74% (9/518)

Table 8. Descriptive Statistics of Target Species Captured at the Green Peter Tailrace-Middle Santiam River Season To-Date

To-Date										
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Green Peter Dam Tailrace-Middle Santiam	Spill	STW	Parr	0	0	0	0	0	0	0
		STW	Smolt	6	175	320	213.7	46.2	316.1	107.1

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

24-Hour Post Collection Holding Trial

No target species were captured during the current reporting period.

Injuries and Copepod Infection

No Spring Chinook were captured at Green Peter Dam. No Winter Steelhead were captured during this reporting period. A summary of injuries observed on Winter Steelhead during the reporting period is provided in Table 9, and target species injuries for the duration of the season are provided in Appendix A.

Table 9. Number of Descaled, Bodily/Eye Injured, Copepod Infected and Dead STW for Sampling Period. (Green Peter Tailrace- Middle Santiam River).

Site	Trap	# Collected	# DSC* <20%	# DSC* >20%	# with Body Injuries	# with Eye Injuries	# with COP* In B.C.	# with COP* on Fins	Mortalities
Green Peter	8 ft	0	0	0	0	0	0	0	0

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

Collected DNA and Scale Samples

No target fish were captured for the reporting period and thus, no scale or DNA samples were collected.

Non-Target Species

No non-target species were captured this reporting period. The season total data is summarized below in Table 10.

Table 10. Summary of Non-target Species (Green Peter Tailrace- Middle Santiam River).

Species	Season Total Capture	Season Total Mortality
Bluegill	86	59
Brook Lamprey	0	0
Bullhead	0	0
Crappie	0	0
Longnose Dace	0	0
Kokanee	125	61
Red-Sided Shiner	0	0
Sculpin	0	0
Smallmouth Bass	1	0
Sucker	2	2
Whitefish	0	0
Cutthroat	0	0
O. mykiss (clipped)	4	2
Unknown	11	11
Totals	**229**	**135**

Stream Statistics

Basic stream statistics at the Green Peter Dam Tailrace- Middle Santiam site were calculated from data downloaded from the U.S. Geological Survey stream gage number 14186110 and 14186200. Gage height (feet) is the only metric provided at gage 14186110. Total dissolved gas saturation data was received from gage number 14186200, 50 meters upstream of the trap. During the reporting period, daily maximum values for instantaneous gage height ranged from 702.1 feet to 710.3 feet (mean: 704.0 feet). Figure 18 shows instantaneous gage height.

Total dissolved gas saturation ranged from 102 to 118% (mean: 104.2%) during the reporting period. Figure 20 shows the total dissolved gas saturation.

The trap and it's HOBO logger were removed prior to this sampling period. Temperature data from USGS gauge 14186200 is provided in figure 21.

Flows through the Powerhouse and Spillway during the reporting period averaged 2,301.3 and 80.7 cubic feet per second (cfs) respectively (Figure 22). 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, Green Peter Tailrace- Middle Santiam River.

	Chinook	Winter Steelhead
Description	8ft	8 ft
Catch	0	0
Effort (hrs)	0	0
CPUE (fish/hr)	0	0

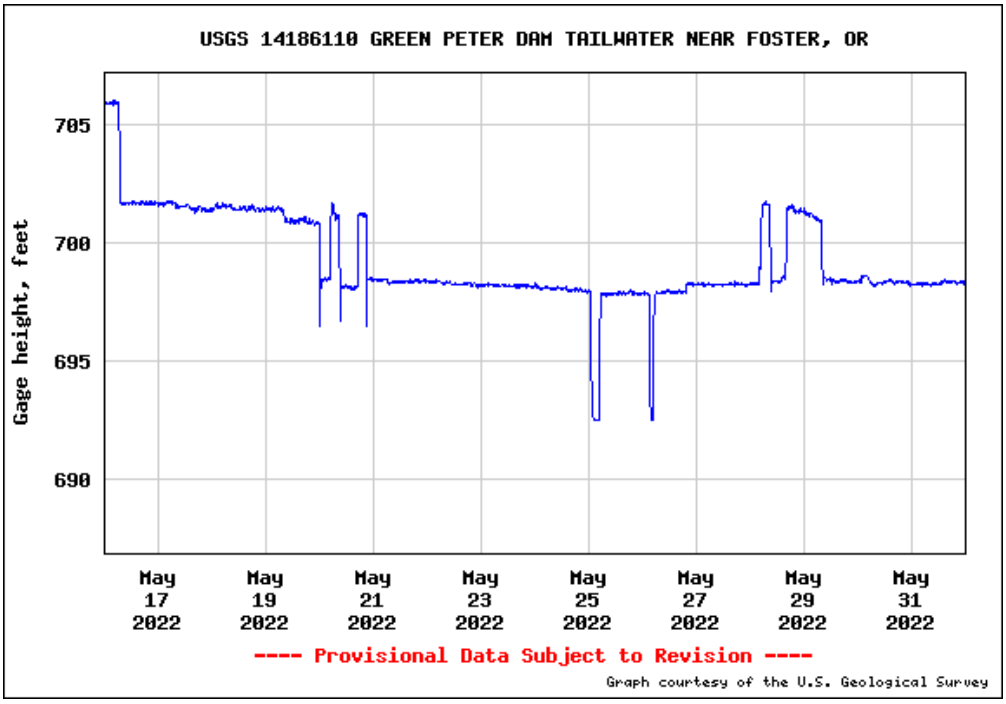


Figure 19. Gage Height (feet); below Green Peter Dam

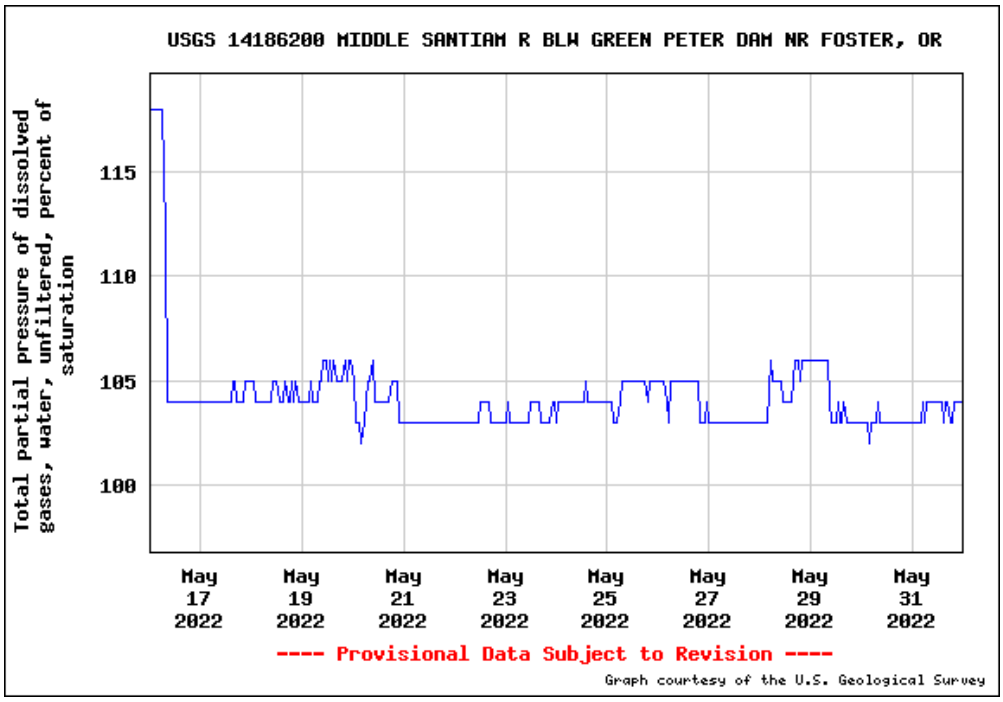
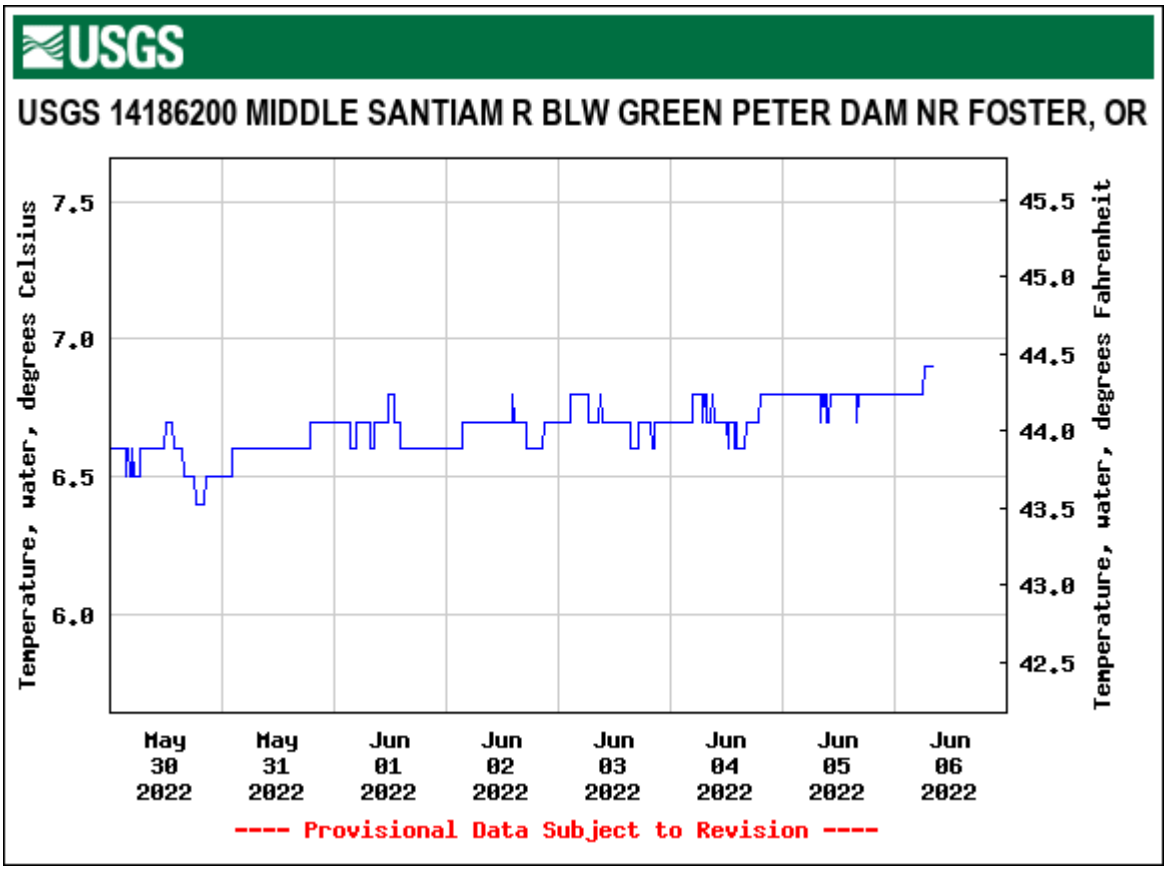


Figure 20. Total Dissolved Gas Saturation (%); below Green Peter Dam



Note: Hobo logger was removed with the trap during reporting period. Temperature from USGS stream gage number 14186200, at trap location.

Figure 21. Temperature at RST (Green Peter Tailrace- Middle Santiam River)

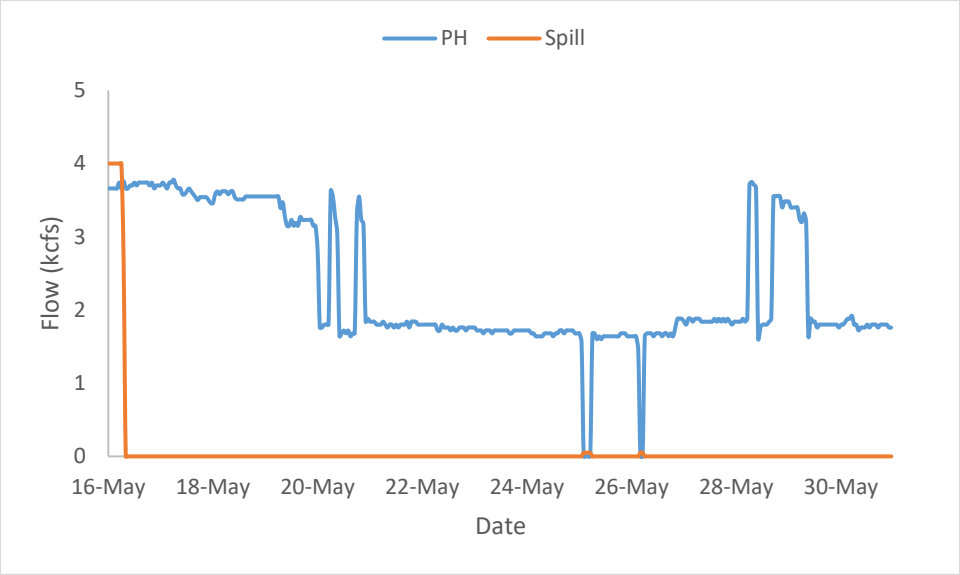


Figure 22. Hourly Flows PWR vs. Spill (Green Peter Dam)

South Fork Santiam– Foster Dam Head of Reservoir

Target Species

This reporting period began on May 16 and ended on May 31. There were no Chinook salmon (CHS) and 4 Winter Steelhead captured (Figure 23) during the 16-day sampling period. Sampling duration was 88% for the RST. The cone was raised on 5/28/2022 in anticipation of a high precipitation event and resumed fishing on 5/30/2022. Table 12 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 23 shows the daily capture numbers for Chinook and Winter Steelhead and Figure 24 shows length frequency data to-date for both species.

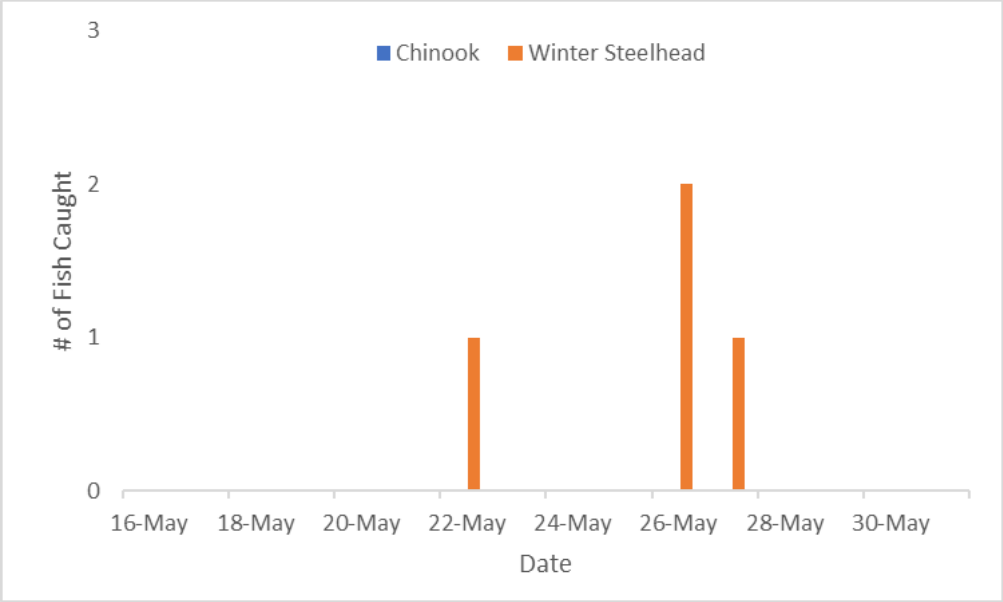


Figure 23. Chinook and Winter Steelhead Captured Per Day 05/16/2022 to 05/31/2022 (Foster Dam Head of Reservoir- South Santiam)

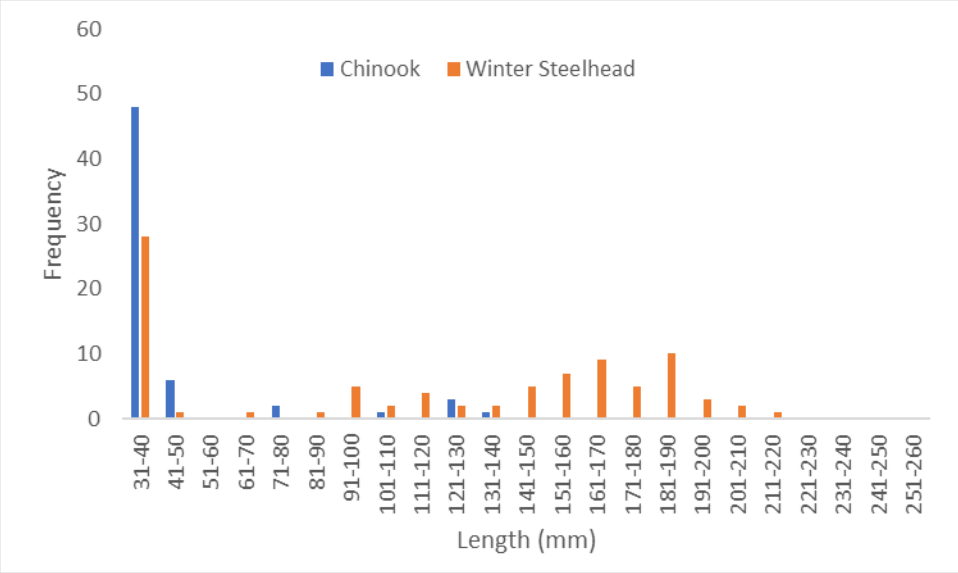


Figure 24. Length Frequency of Juvenile Chinook and Winter Steelhead Sampled Season To-Date (Foster Dam Head of Reservoir- South Santiam)

Trapping Efficiency

10 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 1.7%. Only fish large enough to be safely caudal clipped have been used for efficiency trials.

Table 12. Descriptive Statistics of Target Species Captured at the Foster Dam Head of Reservoir- South Santiam Site Season To-Date

To-Date										
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	54	32	49	35.7	N/A	N/A	N/A
		CHS	Parr	4	73	127	97	3.1	24.7	11.7
		CHS	Smolt	3	120	138	129	19.6	27.5	23.5
		STW	Fry	29	31	46	35.0	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
May 16-31, 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	0	0	0	N/A	N/A	N/A
		CHS	Parr	0	0	0	0	0	0	0
		CHS	Smolt	0	0	0	0	0	0	0
		STW	Fry	0	0	0	0	N/A	N/A	N/A
		STW	Parr	4	93	123	111	8.6	22.5	15.2
		STW	Smolt	0	0	0	0	0	0	0

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

Injuries and Copepod Infection

Partial descaling <20% was observed on 2 of the 4 Winter Steelhead captured (50%). Body injuries were present on 1 Winter Steelhead (25%) and 0 displayed eye injury (0%). No copepods were present on any of the Winter Steelhead captured (0%). A summary of injuries observed during the reporting period are provided in Table 13, 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 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	4	2	0	1	0	0	0	0

Collected DNA and Scale Samples

For the reporting period, scales and DNA were collected from 4 Winter Steelhead and no Spring Chinook.

Non-Target Species

One non-target species fish was captured during the reporting period; the data is summarized below in Table 14.

Table 14. Summary of Non-target Species (Foster Dam Head of Reservoir).

Species	PWR Capture	PWR Mortality	Season Total	Season Total Mortality
Bluegill	0	0	0	0
Brook Lamprey	0	0	0	0
Bullhead	0	0	0	0
Crappie	0	0	0	0
Longnose Dace	0	0	3	0
Kokanee	0	0	0	0
Red-Sided Shiner	0	0	0	0
Sculpin	1	0	1	0
Spotted Bass	0	0	0	0
Sucker	0	0	3	0
Whitefish	0	0	0	0
Cutthroat	0	0	28	0
O. mykiss	0	0	0	0
Pumpkinseed	0	0	0	0
Unknown	0	0	4	0
Totals	**1**	**0**	**39**	**0**

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 gage number 14185000. Discharge (cfs) and Gage height (feet) are available at this gage. During the reporting period, daily maximum values for instantaneous discharge ranged from 891.0 cfs to 2,800.0 cfs (mean: 1,537.2 cfs). Figure 23 shows instantaneous discharge.

Stream temperatures were recorded every 2 hours for the length of the report period for the 5-foot RST (Figure 26). Temperature probes operated normally throughout this reporting period.

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, Foster Dam Head of Reservoir- South Santiam.

	Chinook	Winter Steelhead
Description	**(5 ft)**	
Catch	0	4
Effort (hrs)	327.5	327.5
CPUE (fish/hr)	0.000	0.012

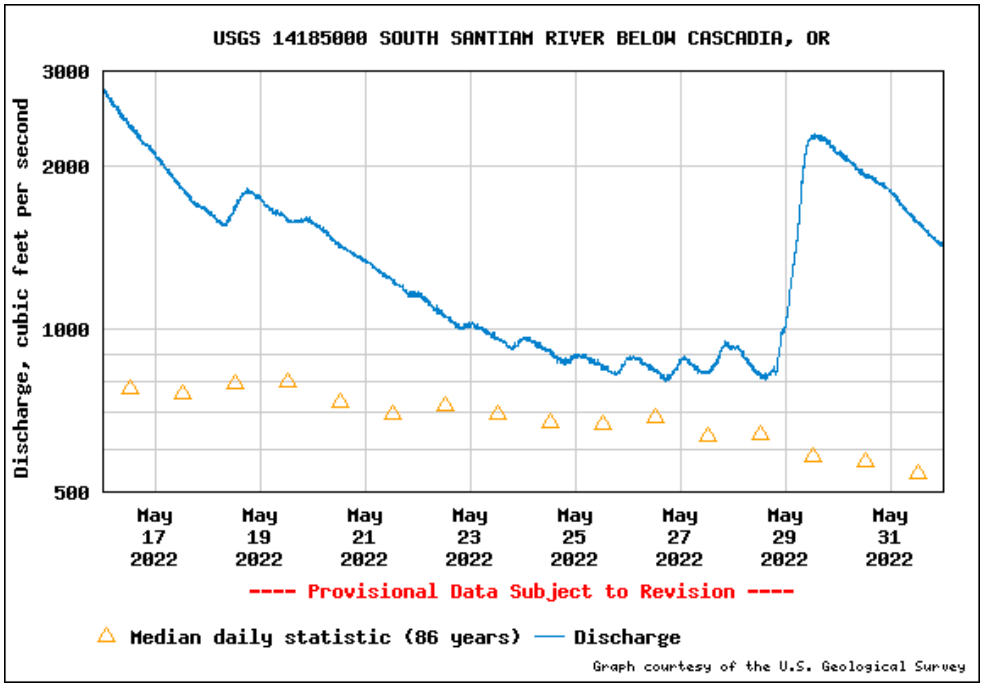


Figure 25. Discharge (cfs); Foster Dam Head of Reservoir – S. Santiam)

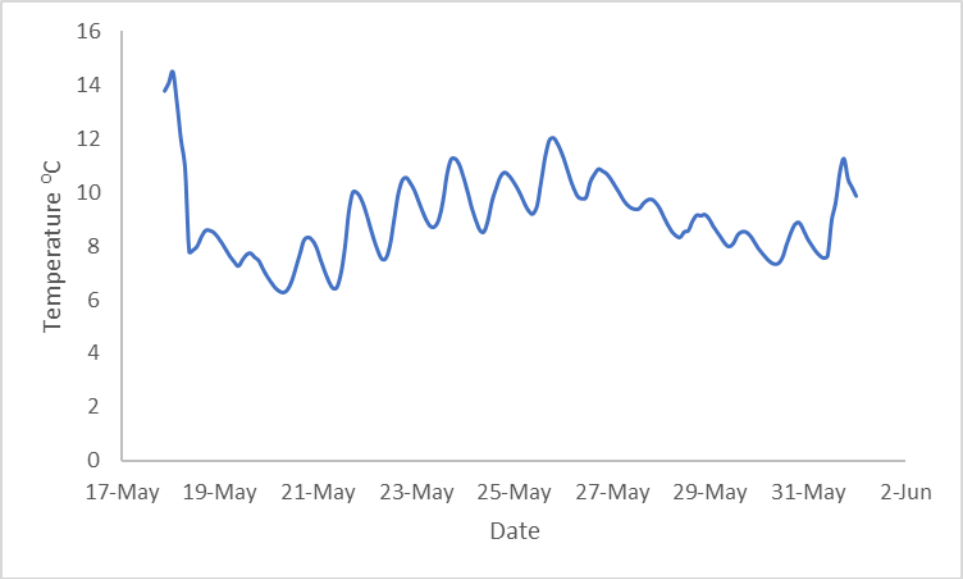
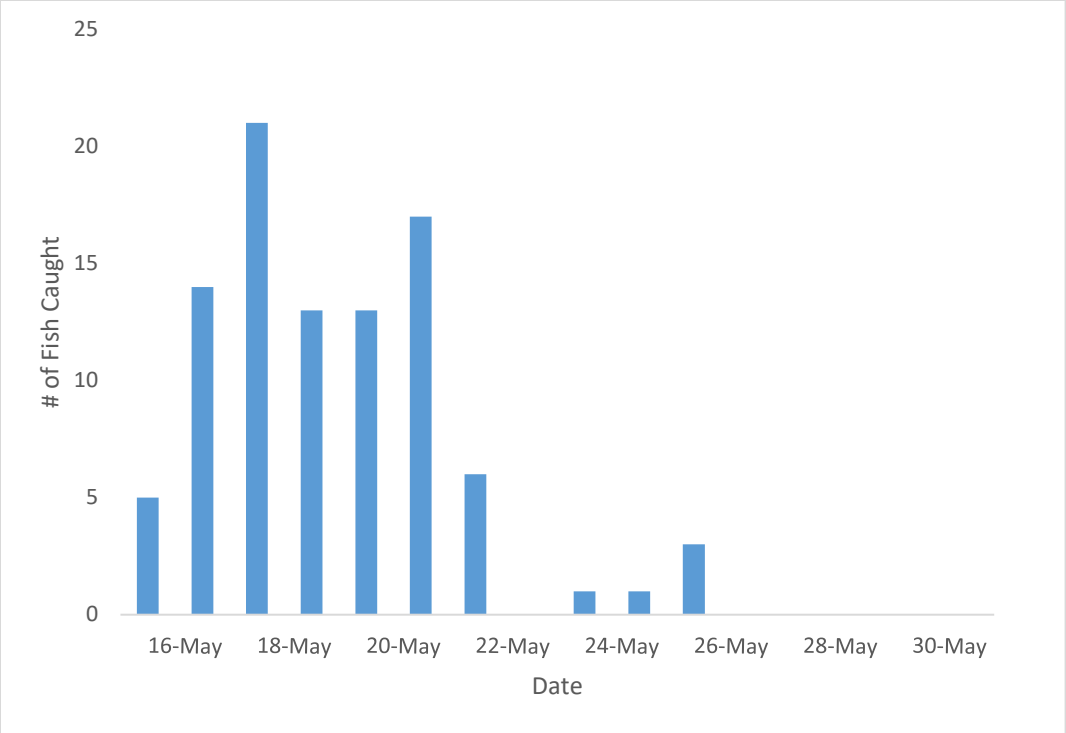


Figure 26. Temperature at RST (Foster Dam Head of Reservoir – S. Santiam)

South Fork McKenzie – Cougar Dam

Target Species

This reporting period began on May 16 and ended on May 31. There was a total of 94 Chinook Salmon (CHS) captured during the 16-day sampling period (Figure 27). Sampling duration was 100% for both Powerhouse RST and RO RSTs. Table 16 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 27 shows the daily capture numbers for chinook and Figure 28 shows length frequency data to-date.



*Recaptured fish for trapping efficiency trials not included.

Figure 27. Chinook Captured Per Day 05/16/2022 to 05/31/2022 (Cougar Dam)

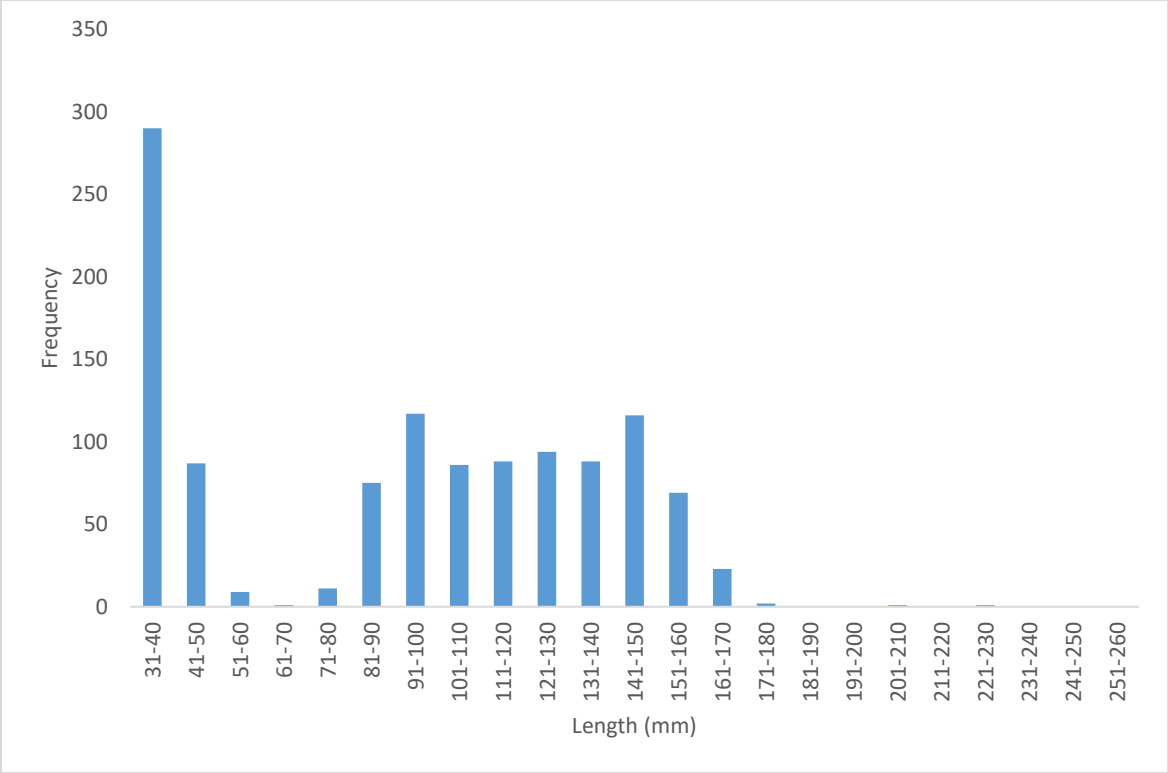


*Figure does not include fish without heads or fish used for trapping efficiency trials.

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

Trapping Efficiency

A total of 993 juvenile hatchery Chinook (sub-yearlings) were bismarck brown dyed, adipose clipped, left vent clipped and released on 05/15/2022. 63 fish were recaptured for an efficiency of 6.3%. 37 fish displayed injuries, primarily descaling and fin damage. 3 fish were dead displaying head injury. Mt. Hood staff noted that fish were in good condition at time of retrieval from the hatchery but displayed some fin damage and minor descaling.

Cougar Dam	Release #	Recapture #	Capture Efficiency
RO Route	993	63	5.56% (21/378)

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Table 16. Descriptive Statistics of Target Species Captured at the Cougar Dam Season To-Date

To-Date											
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*			
					Min	Max	Mean	Min	Max	Mean	
Cougar Dam	RO	CHS	Fry	15	34	48	39.6	N/A	N/A	N/A	
		CHS	Parr	129	56	164	108.2	1.2	41.1	14.6	
		CHS	Smolt	210	92	230	140.0	8.8	86.1	29.1	
Cougar Dam	PWR	CHS	Fry	331	27	47	37.5	N/A	N/A	N/A	
		CHS	Parr	224	58	165	100.3	1.6	41.0	10.9	
		CHS	Smolt	169	76	167	134.3	4.2	45.6	25.0	

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

May 16-31, 2022											
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*			
					Min	Max	Mean	Min	Max	Mean	
Cougar Dam	RO	CHS	Fry	6	39	49	43.8	N/A	N/A	N/A	
		CHS	Parr	6	61	144	114.7	2.2	30.9	19.9	
		CHS	Smolt	15	112	144	127.9	18.6	32.9	22.8	
Cougar Dam	PWR	CHS	Fry	40	29	52	41	N/A	N/A	N/A	
		CHS	Parr	7	54	132	106.3	1.6	27	16.2	
		CHS	Smolt	20	105	149	129.7	11.8	37.3	23.6	

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

24-Hour Post Collection Holding Trial

A total of 77 Chinook captured in the RSTs, 55 fish from the PWR RST and 22 from the RO RST, were held for ~24 hours in holding tanks and then evaluated for survival rates. In total, 3 of the fish (3.9%) held during this period died during holding. 1 of the 55 PWR RST captured fish (1.8%) died during holding and 2 of the 22 RO RST captured fish (9.1%) died during holding.

Injuries and Copepod Infection

Partial descaling <20% was observed on 13 of 27 Chinook collected at the RO RST (48.1%), and descaling >20% was observed on 6 of 27 Chinook collected at the RO RST (22.2%). Of the 27 Chinook captured in the RO RST 12 displayed body injuries (44.4%) and 3 had eye injuries (11.1%). Thirteen of

the RO RST Chinook had copepods present in the branchial cavity (48.1%) and 9 had copepods present on fins (33.3%). One RO RST Chinook displayed Gas Bubble Disease (level 2) (3.7%).

Partial descaling <20% was observed on 17 of the 67 Chinook collected at the PWR RST (25.4%). Descaling >20% was observed on 11 of the 67 Chinook collected at the PWR RST (16.4%). There were 9 PWR RST fish with bodily injuries (13.4%) and 1 had eye injuries (1.5%).10 fish from the PWR RST had copepods present in the branchial cavity (14.9%) and 16 had copepods present on fins (23.9%). One fish displayed Gas Bubble Disease (level 1) (1.5%). There were 3 chinook mortalities collected in the RO RST (11.1%) and 1 in the PWR RST (1.5%). Data is summarized below in Table 17. A summary of injuries observed during the reporting period, and for the duration of the season are provided in Appendix A.

Table 17. 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	27	13	6	12	3	13	9	3
Cougar	PWR	67	17	11	9	1	10	16	1

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

Non-Target Species

A total of 15 non-target species fish were captured during the reporting period; the data is summarized below in Table 18.

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

Species	RO Capture	RO Mortality	PWR Capture	PWR Mortality	Season Total Capture	Season Total Mortality
Bluegill	0	0	0	0	0	0
Lamprey	0	0	0	0	1	0
Bullhead	0	0	0	0	0	0
Crappie	0	0	0	0	0	0
Dace	3	0	4	0	12	1
Kokanee	0	0	0	0	0	0
Red-Sided Shiner	0	0	0	0	0	0
Sculpin	0	0	4	0	30	0
Spotted Bass	0	0	0	0	0	0
Sucker	0	0	0	0	1	0
Whitefish	0	0	0	0	1	0
Cutthroat	0	0	1	0	29	1
O. mykiss	1	0	2	0	85	1
Bull Trout	0	0	0	0	1	0
Unknown	0	0	0	0	20	1
Totals	**4**	**0**	**11**	**0**	**180**	**4**

Stream Statistics

Basic stream statistics at the Cougar Dam site were calculated from data downloaded from U.S. Geological Survey stream gage numbers 14159410 and 14181500. Gage height (feet) is the only metric provided at gage 14159410. Total dissolved gas saturation data was received from gage 14181500, 500 meters downstream of the trap. During the reporting period, daily maximum values for instantaneous gage height ranged from 1,252.9 feet to 1,255.1 feet (mean: 1,254.0 feet). Figure 29 shows instantaneous gage height.

Total dissolved gas saturation ranged from 102 to 118% (mean: 105.3%). Figure 30 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 31 and 32 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 612.1 and 711.8 cubic feet per second (cfs) respectively (Figure 33). 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 salmonid CPUE, Cougar Dam.

	Chinook	
Description	RO (5ft)	PWR(8ft)
Catch	27	67
Effort (hrs)	379.6	760.2
CPUE (fish/hr)	0.071	0.088

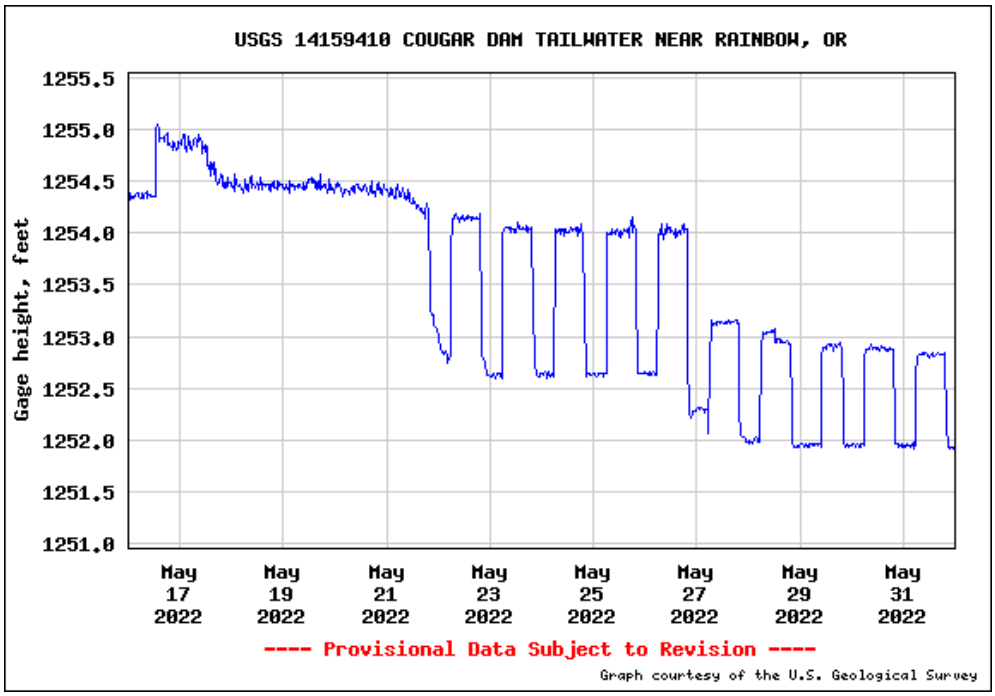


Figure 29. Gage Height (feet); below Cougar Dam, South Fork McKenzie River

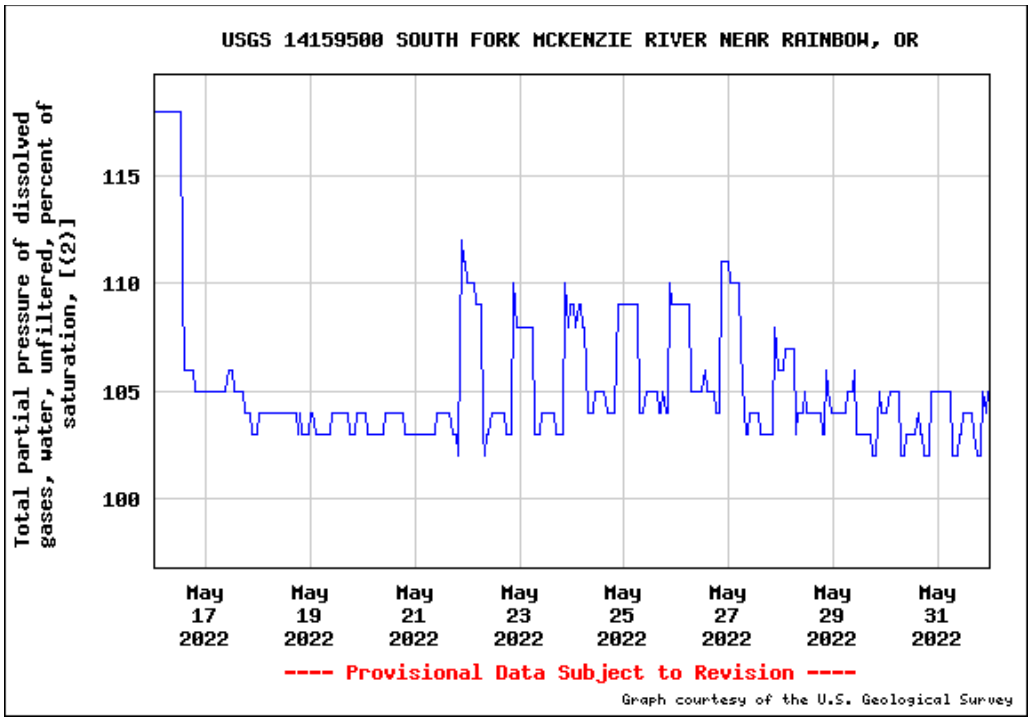


Figure 30. Total Dissolved Gas Saturation (%); below Cougar Dam, South Fork McKenzie River

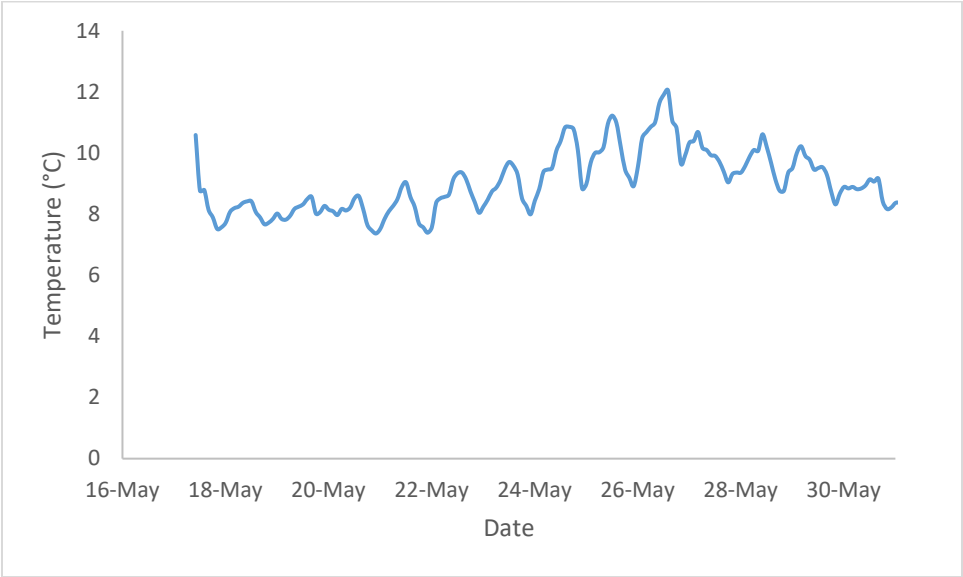


Figure 31. Temperature at RO RST (Cougar Dam)

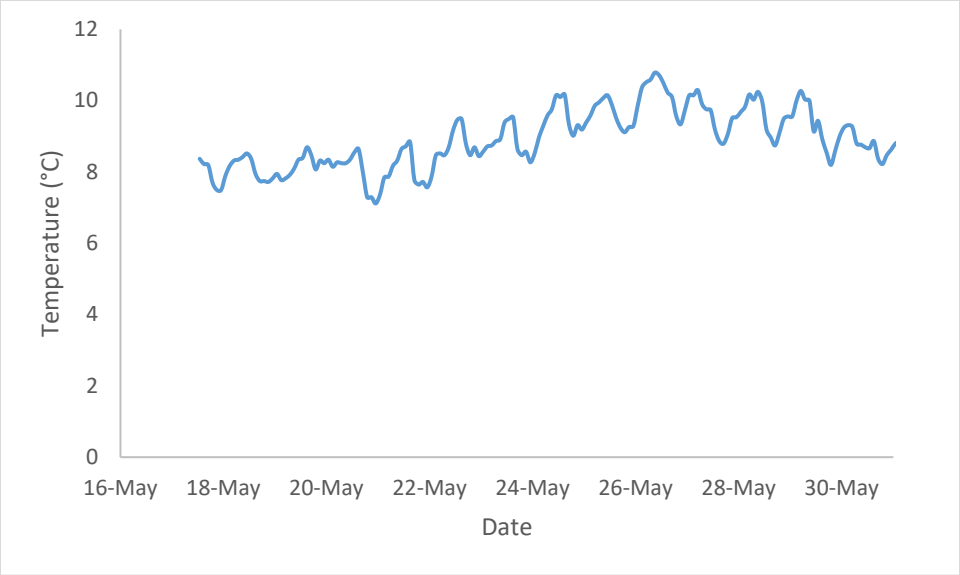


Figure 32. Temperature at PWR RST (Cougar Dam)

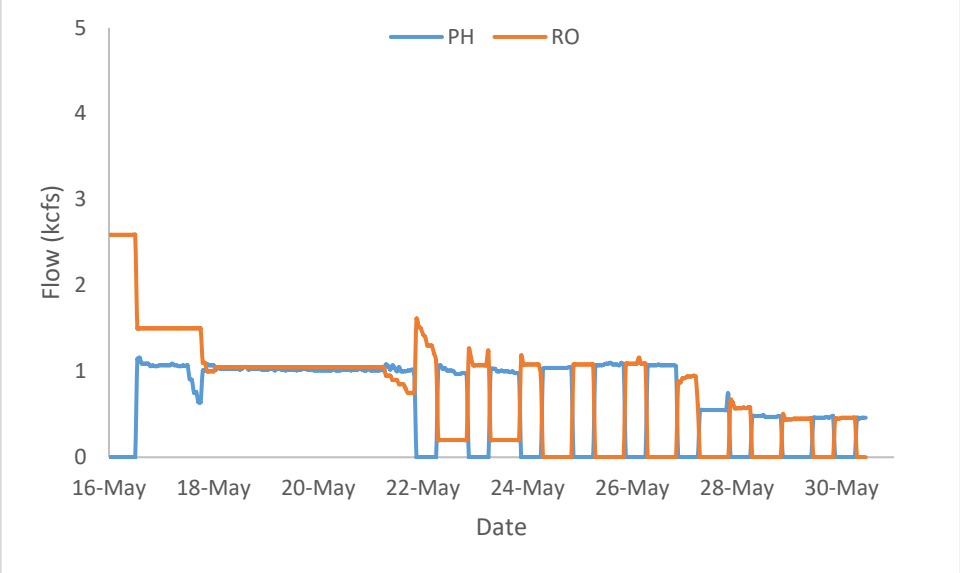


Figure 33. Hourly Flows PWR vs. RO (Cougar Dam)

South Fork of the McKenzie–Cougar Dam Head of Reservoir

Target Species

The reporting period began May 16 and ended May 31. There were 72 Chinook salmon captured during the 16-day sampling period (Figure 34). The trap was operated 94% of the reporting period. Table 20 provides life stage, length, and weight data for all Chinook salmon that have been caught at the site to-date and Figure 35 shows length frequency data to-date.

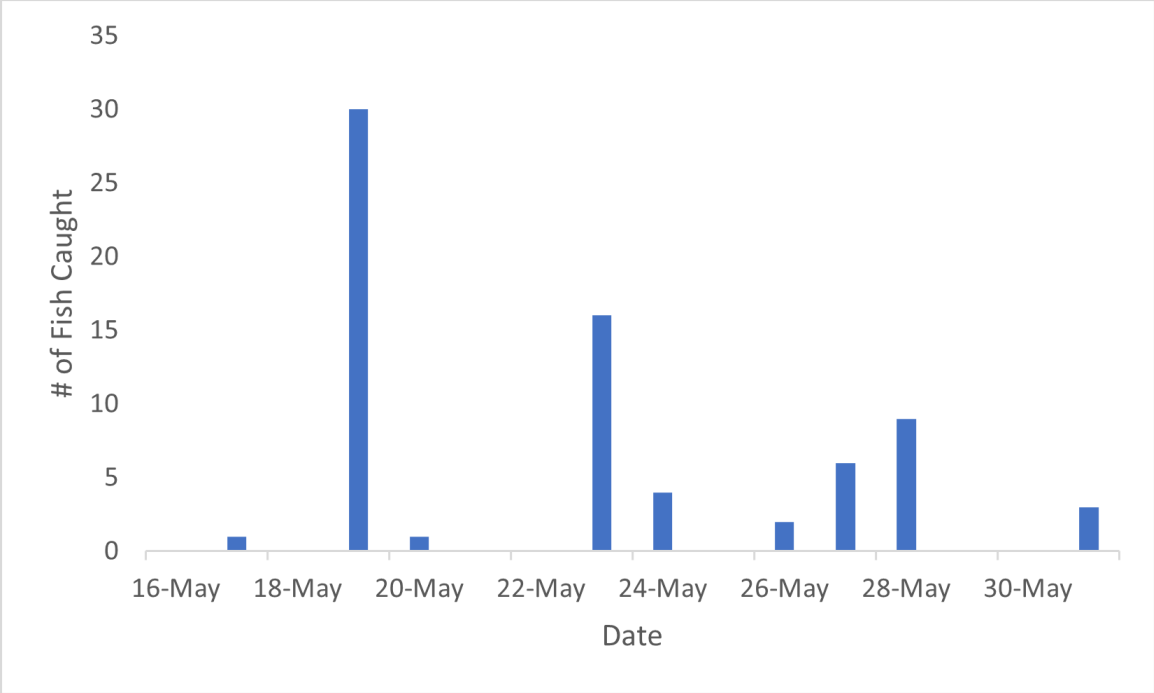


Figure 34. Chinook Captured Per Day 05/16/2022 to 05/31/2022 (Cougar Dam Head of Reservoir)

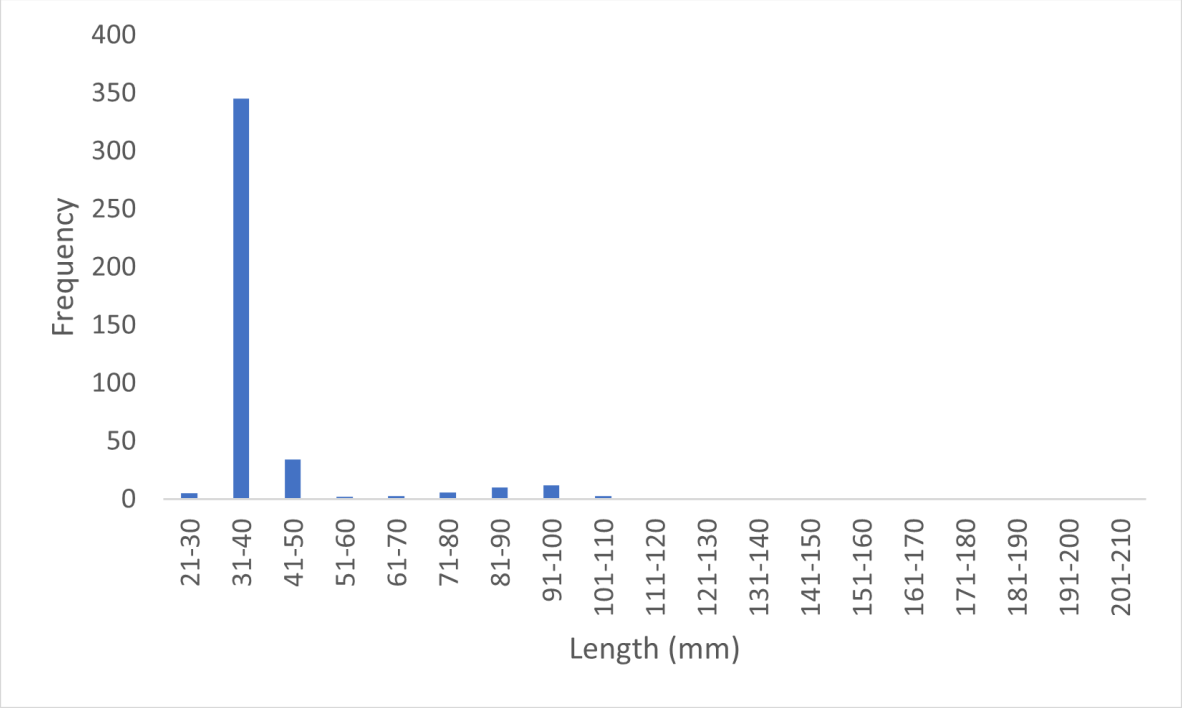


Figure 35. Length Frequency of Juvenile Chinook Sampled Season To-Date (Cougar Dam Head of Reservoir)

Table 20. Descriptive Statistics of Target Species Captured at Cougar Dam 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	
Cougar Dam Head of Reservoir	5 ft	CHS	Smolt	0	0	0	0	0	0	0	
		CHS	Parr	36	58	150	90.3	2.3	11.2	7.4	
		CHS	Fry	386	27	61	36.7	N/A	N/A	N/A	

May 16-31, 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	0	0	0	0	0	0	0	
		CHS	Parr	0	0	0	0	0	0	0	
		CHS	Fry	72	27	61	37.6	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 500 juvenile hatchery Chinook (smolt) were adipose clipped, left or right ventrally clipped and released on 05/19/2022 upstream of the Cougar Head of Reservoir trap site. A total of 23 fish were recaptured in the 5 ft trap. Trapping efficiency was 4.6%.

Of the 23 fish recaptured, 6 were dead and displayed body injuries. This was likely caused by a branch that got stuck in the throat of the trap. None of the other fish captured displayed injuries.

Cougar Dam Head of Reservoir	Release #	Recapture #	Capture Efficiency
5ft trap	500	23	4.6% (23/500)

Injuries and Copepod Infection

There were 72 Chinook were captured for the reporting period. Of the fish captured, partial descaling <20% was observed on 0 fish (0%), 0 had copepods (0%), and 3 had bodily injury (4.2%). There were 0 mortalities for this reporting period (0%). Injury data for the reporting period is summarized 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. (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	72	0	0	3	0	0	0	0

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

Collected DNA and Scale Samples

Scales and DNA were collected from 2 of the Chinook captured (2.7%). 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).

Non-Target Species

A total of 67 non-target fish were captured at the Cougar Dam Head of Reservoir RST during the reporting period; the data is summarized below in Table 22.

Table 22. Summary of Non-target Species (Cougar Dam Head of Reservoir)

Species	5ft Capture	5ft Mortality	Season Total	Season Total Mortality
Bluegill	0	0	0	0
Lamprey	0	0	0	0
Bullhead	0	0	0	0
Bull Trout	1	0	2	0
Crappie	0	0	0	0
Cutthroat Trout	1	0	41	1
Longnose Dace	1	0	4	0
Speckled Dace	0	0	1	0
Red-Sided Shiner	0	0	0	0
Sculpin	0	0	2	1
Spotted Bass	0	0	0	0
Sucker	0	0	0	0
Whitefish	0	0	0	0
O. mykiss	64	1	285	2
Unknown	0	0	8	0
Totals	**67**	**1**	**343**	**4**

Stream Statistics

Basic stream statistics at the site were calculated from data downloaded from the U.S. Geological Survey stream gage number 14159200. During the reporting period, daily maximum values for instantaneous

discharge ranged from 1,020.0 cfs to 2,060.0 cfs (mean: 1,341.9 cfs). Figure 36 shows instantaneous discharge.

Stream temperature was recorded every two hours with a temperature probe at the trap. The temperature probe operated normally during this period. Due to the restricted access above Cougar Dam from heavy snow, data from the temperature probe was not downloaded (Figure 37).

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 Chinook CPUE, Cougar Dam Head of Reservoir

	Chinook
Description	**5 ft**
Catch	72
Effort (hrs)	334.9
CPUE (fish/hr)	0.215

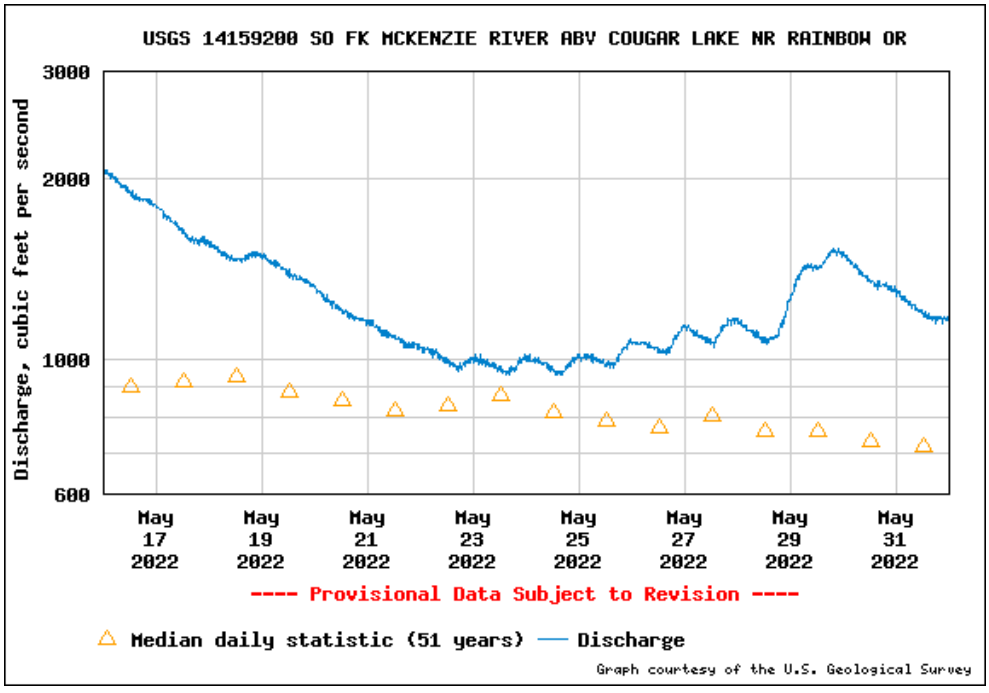


Figure 36. Gage Height (feet); South Fork McKenzie above Cougar Dam

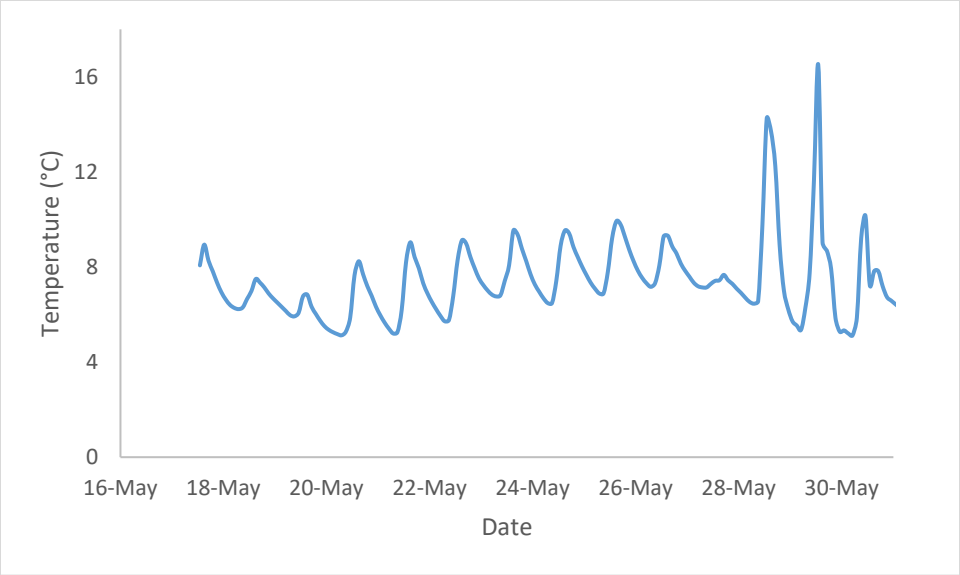


Figure 37. Temperature at RST (Cougar Dam Head of Reservoir)

Middle Fork Willamette – Fall Creek Dam Tailrace

Target Species

The reporting period began May 16 and ended May 31. No Chinook salmon were captured during the 16-day sampling period (Figure 38). The trap was operated 100% of the reporting period. Table 24 provides life stage, length, and weight data for all Chinook salmon that have been caught at the Fall Creek Dam Tailrace site to-date and Figure 39 shows length frequency data to-date.

Figure 38. Chinook Captured Per Day 05/16/2022 to 05/31/2022 (Fall Creek Dam Tailrace)

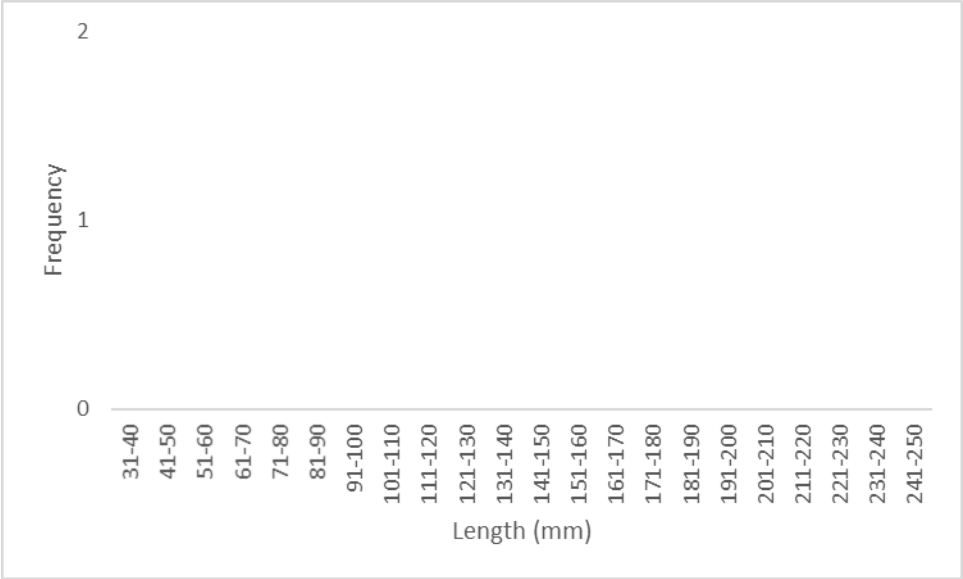


Figure 39. Length Frequency of Juvenile Chinook Sampled Season To-Date (Fall Creek Dam Tailrace)

Table 24. Descriptive Statistics of Target Species Captured at Fall Creek Dam Tailrace, 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	
Fall Creek Dam	RO	CHS	Smolt	0	0	0	0	0	0	0	
		CHS	Parr	0	0	0	0	0	0	0	

May 16-31,2022											
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*			
					Min	Max	Mean	Min	Max	Mean	
Fall Creek Dam	RO	CHS	Smolt	0	0	0	0	0	0	0	
		CHS	Parr	0	0	0	0	0	0	0	

Injuries and Copepod Infection

No Chinook were captured during this reporting period. The data is summarized in Table 25. To date injury data is listed in Appendix A.

Table 25. Number of Descaled, Bodily/Eye Injured, Copepod Infected and Dead Chinook Salmon for Sampling Period. (Fall Creek)

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

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

Trapping Efficiency

Trapping efficiency trials have not been conducted at the Fall Creek Dam Tailrace site to date.

Non-Target Species

Seven non-target fish were captured at the Fall Creek Dam Tailrace site during the reporting period; the data is summarized below in Table 26.

Table 26. Summary of Non-target Species (Fall Creek Dam Tailrace)

Species	8ft Capture	8ft Mortality	Season Total	Season Total Mortality
Bluegill	0	0	0	0
Lamprey	0	0	0	0
Bullhead	0	0	0	0
Bull Trout	0	0	0	0
Crappie	0	0	0	0
Cutthroat Trout	0	0	4	0
Dace	6	0	92	0
Red-Sided Shiner	0	0	3	0
Sculpin	1	0	1	0
Spotted Bass	0	0	0	0
Sucker	0	0	3	0
Whitefish	0	0	0	0
O. mykiss	0	0	5	1
Totals	**7**	**0**	**108**	**1**

Stream Statistics

Basic stream statistics at the site were calculated from data downloaded from U.S. Geological Survey stream gage numbers 14151000 and 1415000. Instantaneous discharge (cfs) data was collected from gage 1415100. Dissolved oxygen (mg/L) concentration data was received from gage 1415000, 1.2 rkms downstream of the trap. During the reporting period, daily maximum values for instantaneous discharge ranged from 235.0 cfs to 241.0 cfs (mean: 235.9 cfs). Figure 40 shows instantaneous discharge.

Dissolved oxygen concentrations ranged from 11.4 to 12.3 mg/L (mean: 11.9 mg/L) during the reporting period. Figure 41 shows dissolved oxygen concentrations.

Stream temperatures were recorded using temperature probes for the Fall Creek Dam Tailrace RST site during this reporting period. The temperature probe operated normally during this period (Figure 42).

Flows In and Out of reservoir during the reporting period averaged 786.6 cfs and 233.9 cfs respectively (Figure 43).

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, Fall Creek Dam Tailrace

Description	Chinook (8 ft)
Catch	0
Effort (hrs)	392.1
CPUE (fish/hr)	0

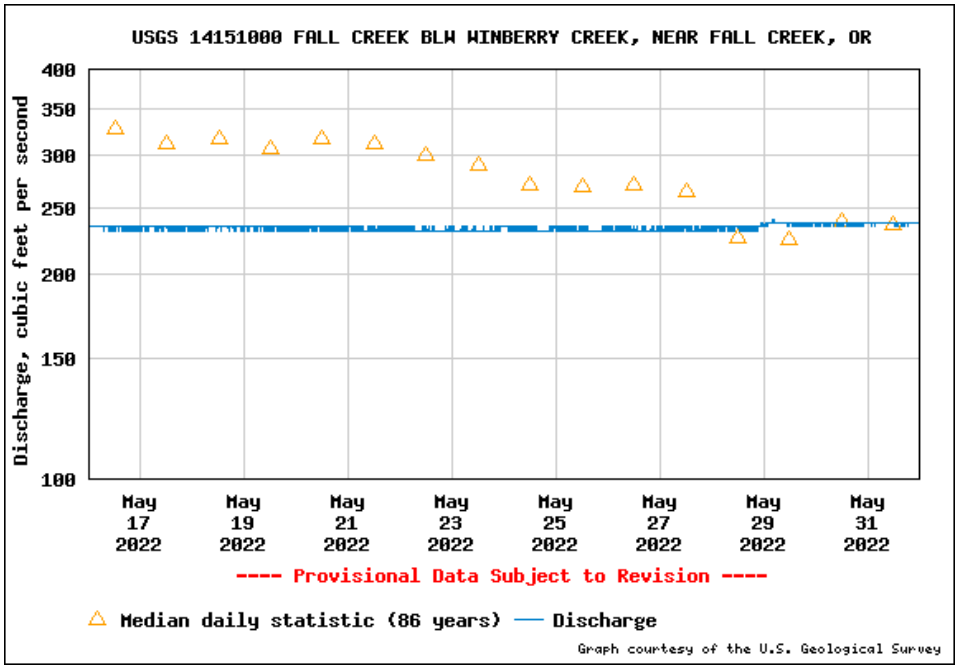


Figure 40. Discharge (cfs); Fall Creek Below Winberry Creek, Near Fall Creek, OR

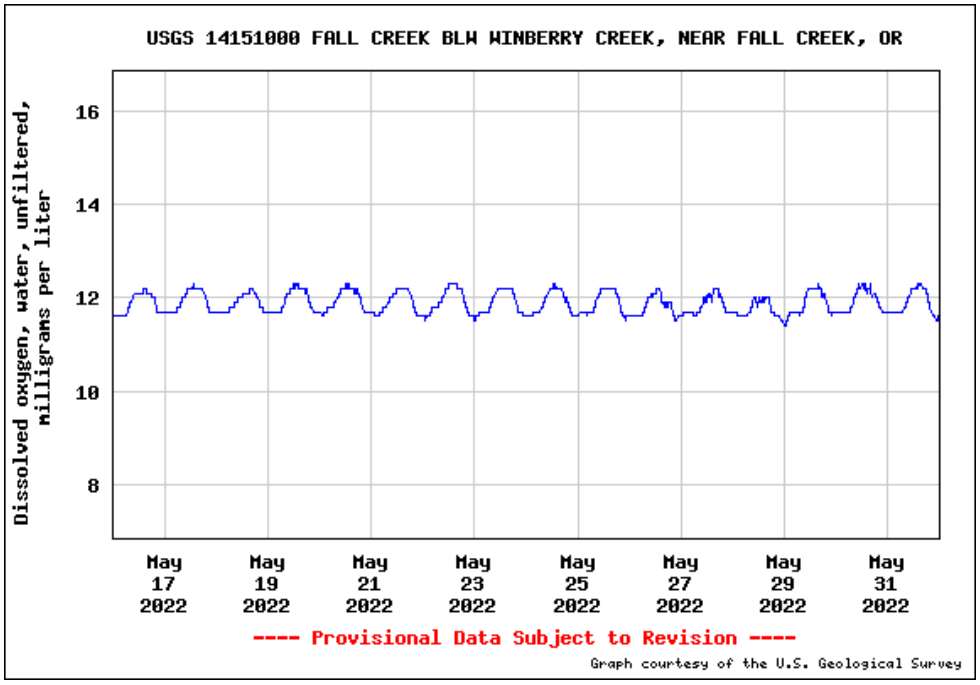


Figure 41. Dissolved Oxygen (mg/L); Fall Creek below Winberry Creek, Near Fall Creek, OR

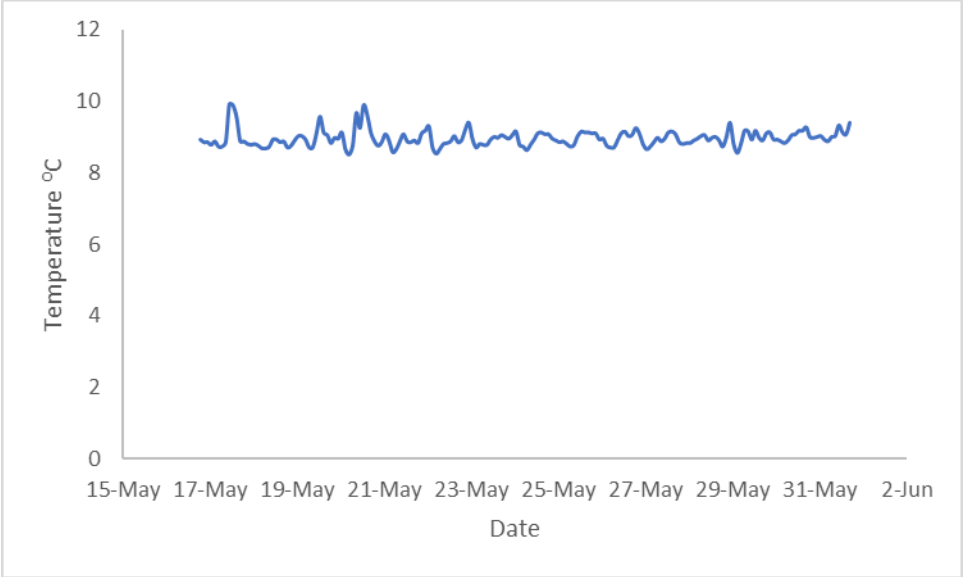


Figure 42. Temperature at RST (Fall Creek Dam Tailrace)

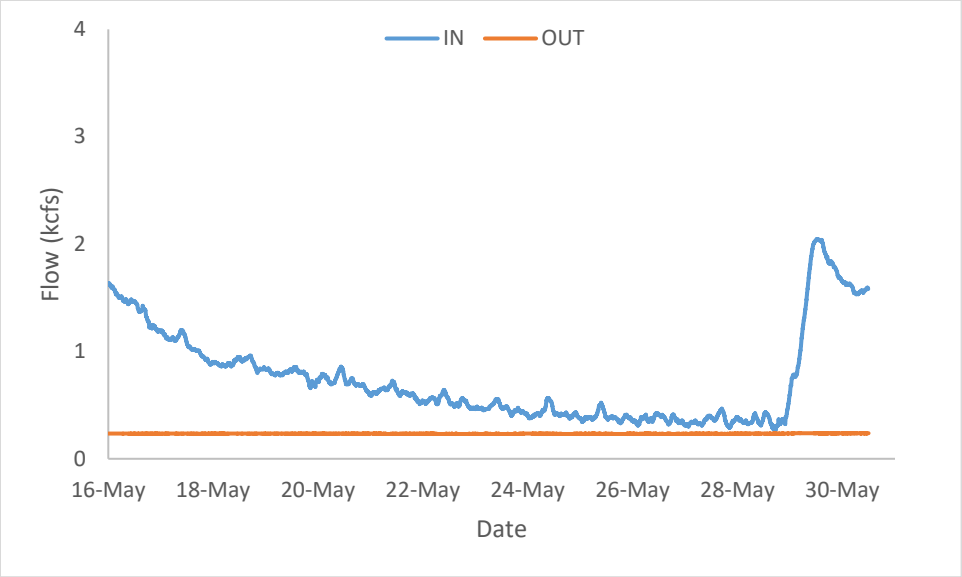


Figure 43. Hourly Flows PWR vs. RO (Fall Creek Tailrace)

Middle Fork Willamette – Fall Creek Head of Reservoir

Target Species

The reporting period began May 16 and ended May 31. No Chinook salmon was captured during the 16-day sampling period (Figure 44). The RST was put into the non-sampling position on the 28th due to high flows and debris loads. Sampling resumed on the 30th once debris load and flows returned to a safe level for operation and access. The trap was operated 94% of the reporting period. Table 28 provides life stage, length, and weight data for all Chinook salmon that have been caught at the Fall Creek Head of Reservoir site to-date and Figure 45 shows length frequency data to-date.

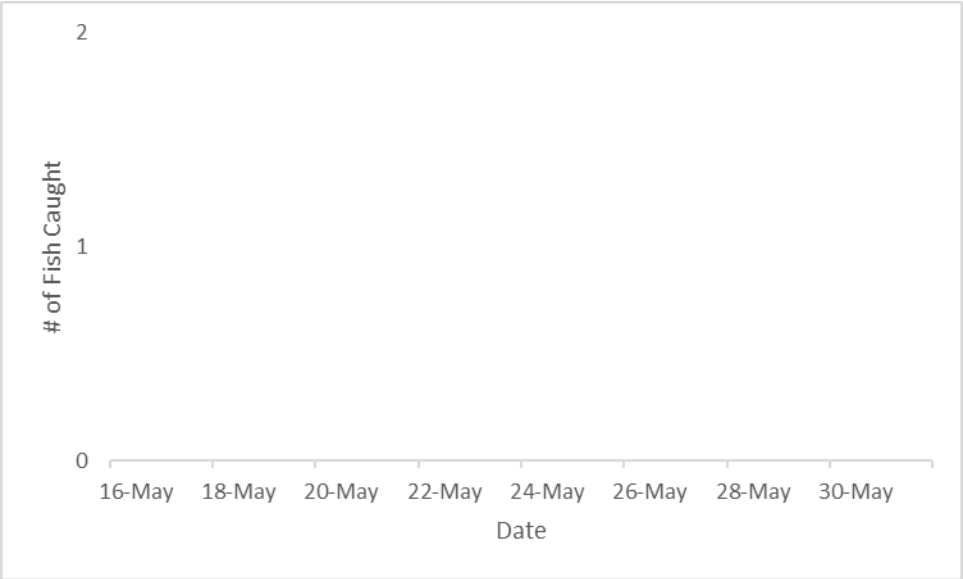


Figure 44. Chinook Captured Per Day 05/16/2022 to 05/31/2022 (Fall Creek Head of Reservoir)

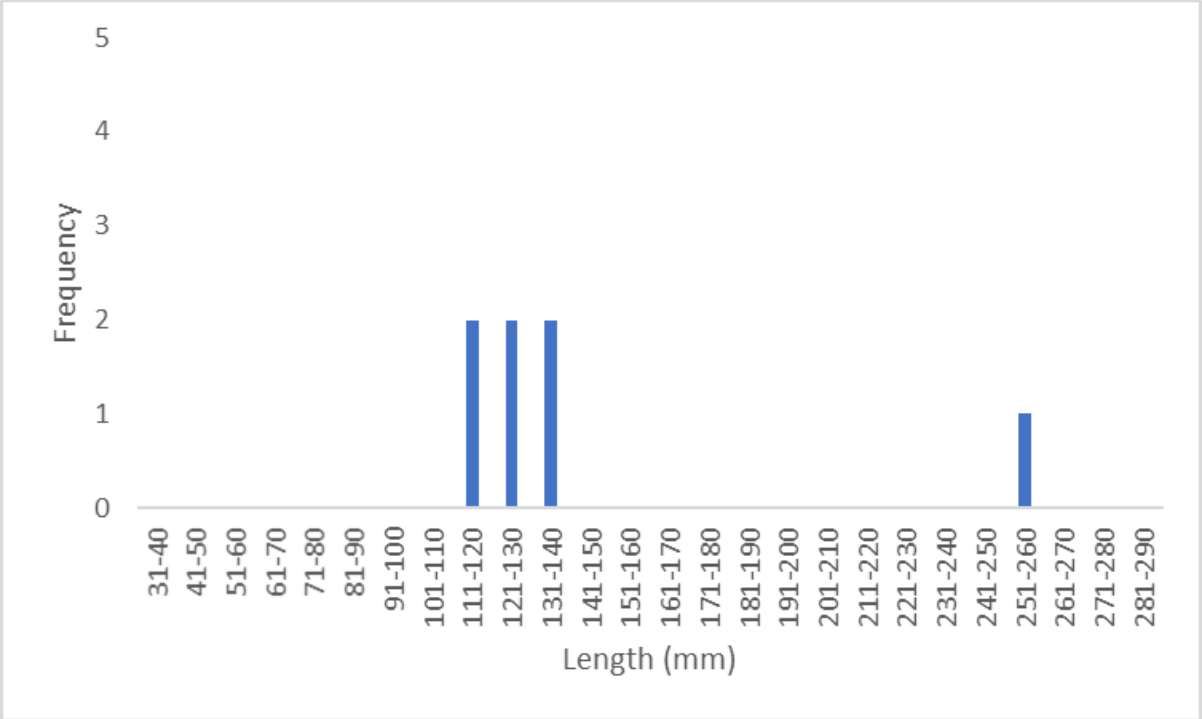


Figure 45. Length Frequency of Juvenile Chinook Sampled Season To-Date (Fall Creek Head of Reservoir)

Table 28. Descriptive Statistics of Target Species Captured at Fall Creek 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	
Fall Creek Head of Reservoir	8 ft	CHS	Smolt	5	127	255	157.2	21.5	108.5	214.3	
		CHS	Parr	2	119	120	119.5	16.1	19.8	18.0	

May 16-31, 2022										
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Fall Creek Head of Reservoir	8 ft	CHS	Smolt	0	0	0	0	0	0	0
		CHS	Parr	0	0	0	0	0	0	0

Injuries and Copepod Infection

No Chinook were captured during this reporting period. To date injury data can be found in Appendix A.

Table 29. Number of Descaled, Bodily/Eye Injured, Copepod Infected and Dead Chinook Salmon for Sampling Period. (Fall Creek 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
Fall Creek Head of Reservoir	0	0	0	0	0	0	0	0

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

Trapping Efficiency

0 Chinook were caudal clipped and released upstream to conduct a run of river trapping efficiency trial during this period. 7 fish have been released for efficiency testing to date. 1 fish was recaptured during a previous reporting period (released March 18 and recaptured March 22) for an efficiency of 14.3%.

Collected DNA and Scale Samples

No Chinook were captured during this reporting period.

Non-Target Species

A total of 103 non-target fish were captured at the Fall Creek Head of Reservoir site during the reporting period; the data is summarized below in Table 30.

Table 30. Summary of Non-target Species (Fall Creek Head of Reservoir)

Species	8ft Capture	8ft Mortality	Season Total	Season Total Mortality
Bluegill	0	0	0	0
Lamprey	35	0	284	3
Bullhead	0	0	0	0
Bull Trout	0	0	0	0
Crappie	0	0	0	0
Cutthroat Trout	21	0	73	0
Longnose Dace	36	0	46	0
Speckled Dace	8	0	10	0
Red-Sided Shiner	0	0	0	0
Sculpin	0	0	1	1
Spotted Bass	0	0	0	0
Sucker	0	0	0	0
Whitefish	0	0	0	0
O. mykiss	3	0	282	10
O. mykiss (clipped)	0	0	80	0
Totals	**103**	**0**	**776**	**14**

Stream Statistics

Basic stream statistics at the Fall Creek site were calculated from data downloaded from the U.S. Geological Survey stream gage number 14150290. During the reporting period, daily maximum values for instantaneous gage height ranged from 3.6 feet to 5.3 feet (mean: 4.3 feet). Figure 46 shows instantaneous gage height.

Stream temperatures were recorded every 2 hours for the Fall Creek RST (Figure 47). Temperature probes for the Fall Creek RST operated normally throughout this reporting period.

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, Fall Creek Head of Reservoir

	Chinook
Description	**8 ft**
Catch	0
Effort (hrs)	336.1

CPUE (fish/hr)	0

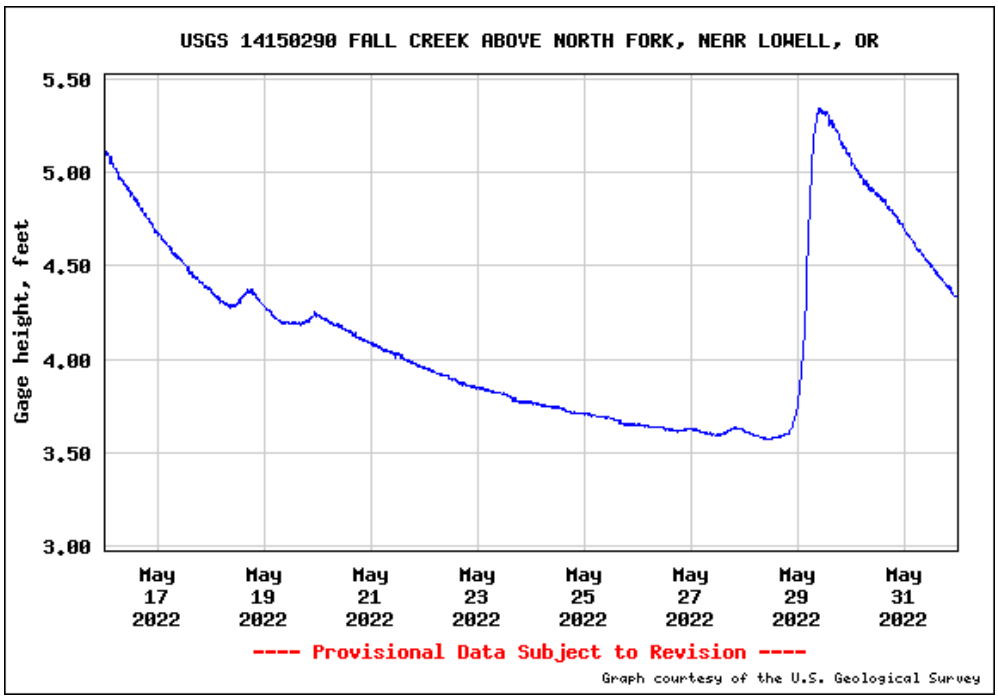
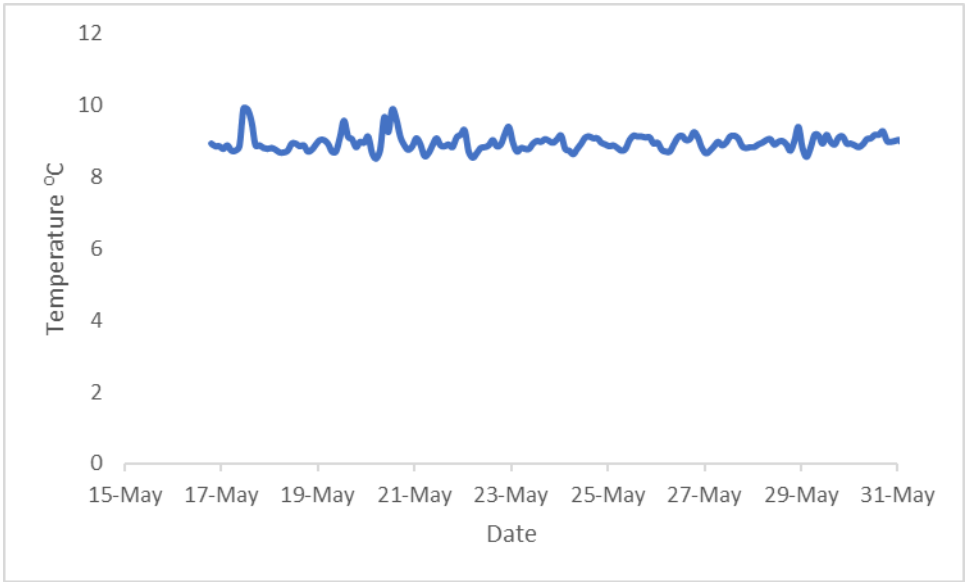


Figure 46. Gage Height (feet); Fall Creek Above North Fork, Near Lowell OR



Note: Hobo logger was missing when crew members attempted to download.

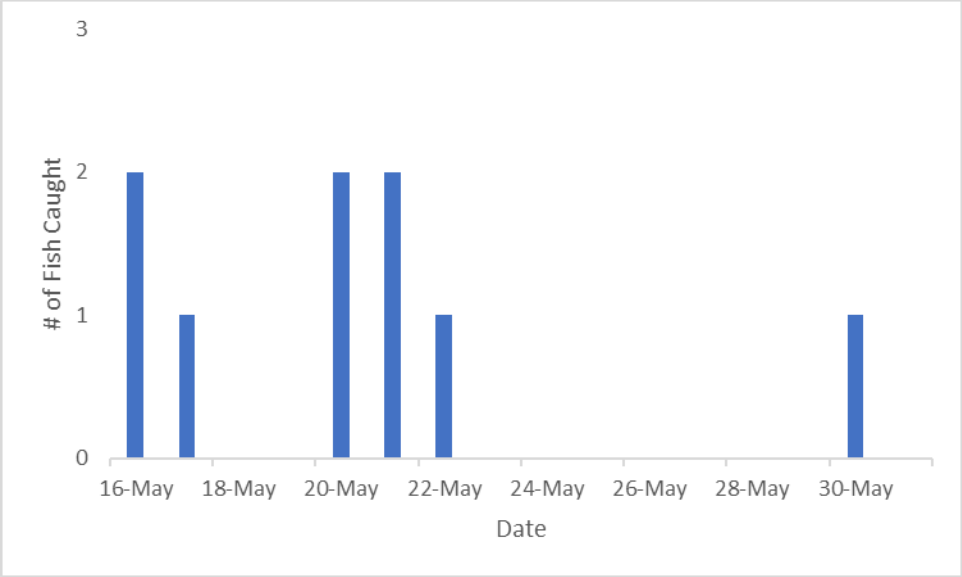
Temperature data supplemented with USGS gage site number 14150290, 1.2 rkm downstream.

Figure 47. Temperature at RST (Fall Creek Head of Reservoir)

Middle Fork Willamette– Dexter Dam

Target Species

This reporting period began on May 16 and ended on May 31. There were 9 Chinook salmon (CHS) captured during the 16-day sampling period (Figure 48). Sampling duration was 100% for the 5 ft RST. Table 32 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 44 shows the daily capture numbers for Chinook and Figure 49 shows length frequency data to-date.



*Recaptured fish for trapping efficiency trials not included.

Figure 48. Chinook Captured Per Day 05/16/2022 to 05/31/2022 (Dexter Dam)

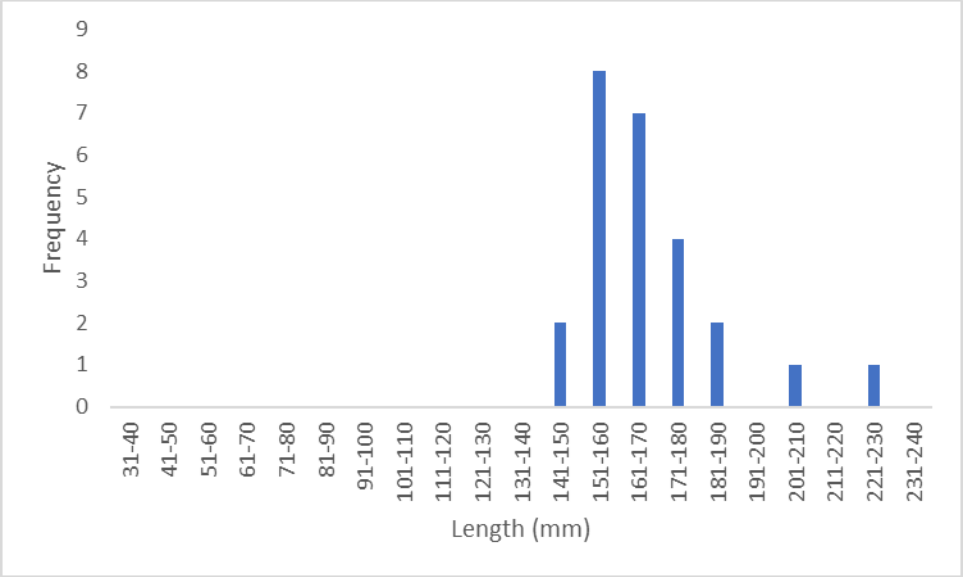


*Figure does not include fish without heads or fish used for trapping efficiency trials.

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

Table 32. Descriptive Statistics of Target Species Captured at the Dexter Dam RST Season To-Date

To-Date											
Site	Trap	Species	Life stage	Collected	Length (mm)*			Weight (g)*			
					Min	Max	Mean	Min	Max	Mean	
Dexter Dam	5 ft	CHS	Parr	1	159	159	159	48.3	48.3	48.3	
		CHS	Smolt	24	142	224	168.8	21.4	118.4	44.8	

May 16-31, 2022										
Site	Trap	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Dexter Dam	5 ft	CHS	Parr	1	159	159	159	48.3	48.3	48.3
		CHS	Smolt	8	154	179	165.1	21.4	64.8	39.7

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

Trapping Efficiency

A total of 1019 juvenile hatchery Chinook (parr) were bismarck brown dyed, adipose clipped, upper caudal clipped and released on 05/24/2022 below Dexter Dam. Fish were released in small groups into different locations in the spillway flow to evaluate the traps efficiency capturing fish passing through spill. 67 fish were recaptured in the 5-foot RST for an efficiency of 6.6%.

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	1019	67	6.6% (67/1000)
Powerhouse	N/A	N/A	N/A

24-Hour Post Collection Holding Trial

7 Chinook captured were held for 24 hours. 3 fish died in holding (42.9%) during this reporting period.

Injuries and Copepod Infection

9 Chinook were captured during this reporting period. Partial descaling <20% was observed in 5 of the 9 Chinook captured (55.6%) and 4 displayed descaling >20% (4.4%). 7 displayed body injury (63.6%) and 0 Chinook had eye injury (0%). 2 Chinook had copepods present in the branchial cavity (18.2%) and 0 had copepods on fins (0%). 2 displayed gas bubble disease (18.2%) (two at level 1). There were 2 mortalities this reporting period (18.2%). Injuries are displayed in Table 33. 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. (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	9	5	4	7	0	2	0	2

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

Non-Target Species

A total of 20 non-target species fish were captured during the reporting period; the data is summarized below in Table 34. 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.

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

Species	Capture	Mortality	Season Total	Season Total Mortality
Bluegill	0	0	1	0
Brook Lamprey	0	0	0	0
Bullhead	0	0	0	0
Crappie	0	0	7	2
Longnose Dace	3	3	28	5
Speckled Dace	0	0	1	0

Kokanee	0	0	0	0
Red-Sided Shiner	1	0	1	0
Sculpin	13	4	172	10
Spotted Bass	0	0	0	0
Sucker	0	0	2	0
Whitefish	0	0	0	0
Cutthroat	0	0	2	0
O. mykiss	0	0	6	0
O. mykiss (clipped)	2	0	16	0
Chinook (AD Clipped)	1	0	18	0
Totals	**20**	**7**	**254**	**17**

Stream Statistics

Basic stream statistics at the Dexter Dam site were calculated from data downloaded from the U.S. Geological Survey stream gage numbers 14149510 and 14150000. Gage height (feet) is the only metric provided at gage 14149510. Total dissolved gas saturation data was received from gage 14150000, 4.75 rkms downstream of the trap. During the reporting period, daily maximum values for instantaneous gage height ranged from 637.4 feet to 639.6 feet (mean: 638.2 feet). Figure 50 shows instantaneous gage height.

Total dissolved gas saturation ranged from 107 to 116% (mean: 111.3%) during the reporting period. Figure 51 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 52.

Flows through the Powerhouse and Spill during the reporting period averaged 0 and 3,104.6 cubic feet per second (cfs) respectively (Figure 53). Catch per unit of effort (CPUE) data are summarized in Table 35. Discharge and capture data for the duration of monitoring efforts at this location are provided in Appendix B.

Table 35. Summary of salmonid CPUE, Dexter Dam.

	Chinook
Description	**8 ft**
Catch	9
Effort (hrs)	383.3
CPUE (fish/hr)	0.023

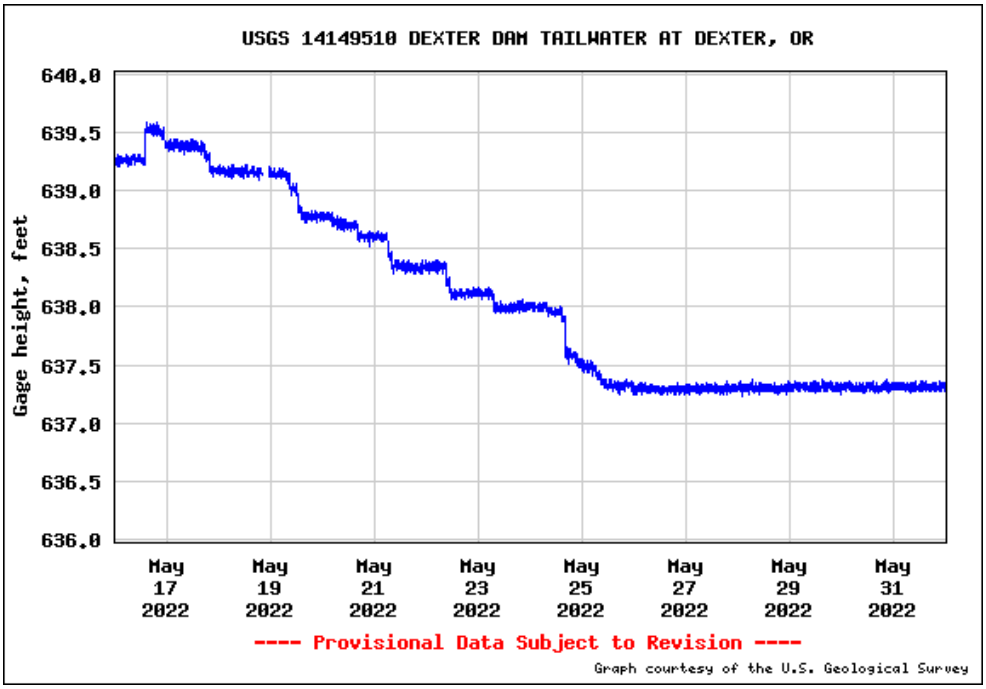


Figure 50. Gage Height (feet); below Dexter Dam, Middle Fork Willamette

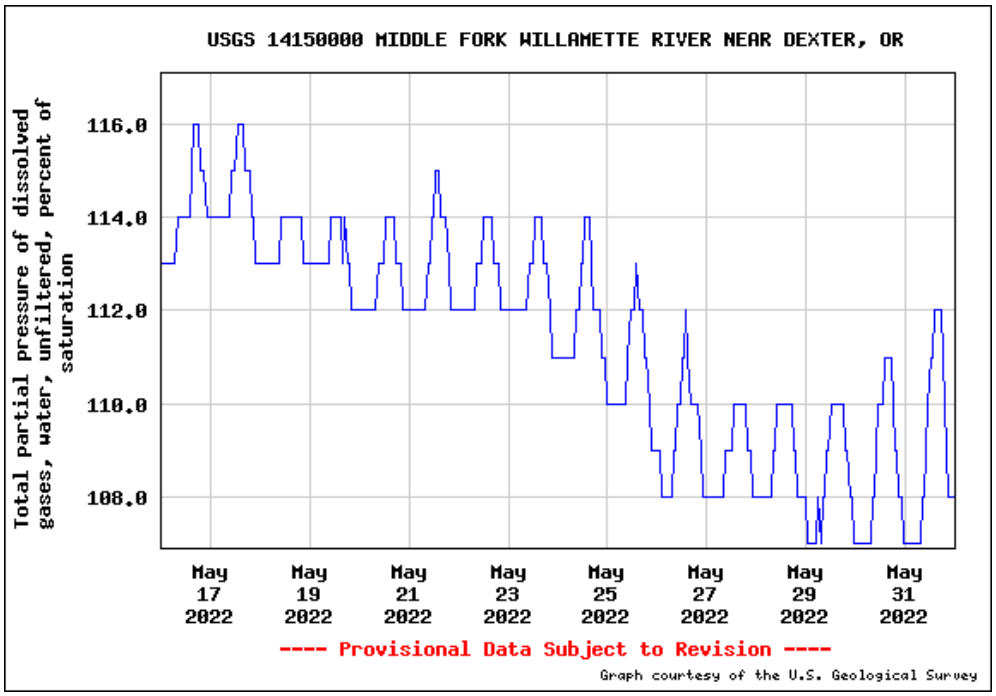


Figure 51. Total Dissolved Gas Saturation (%); Middle Fork Willamette River, Near Dexter, OR

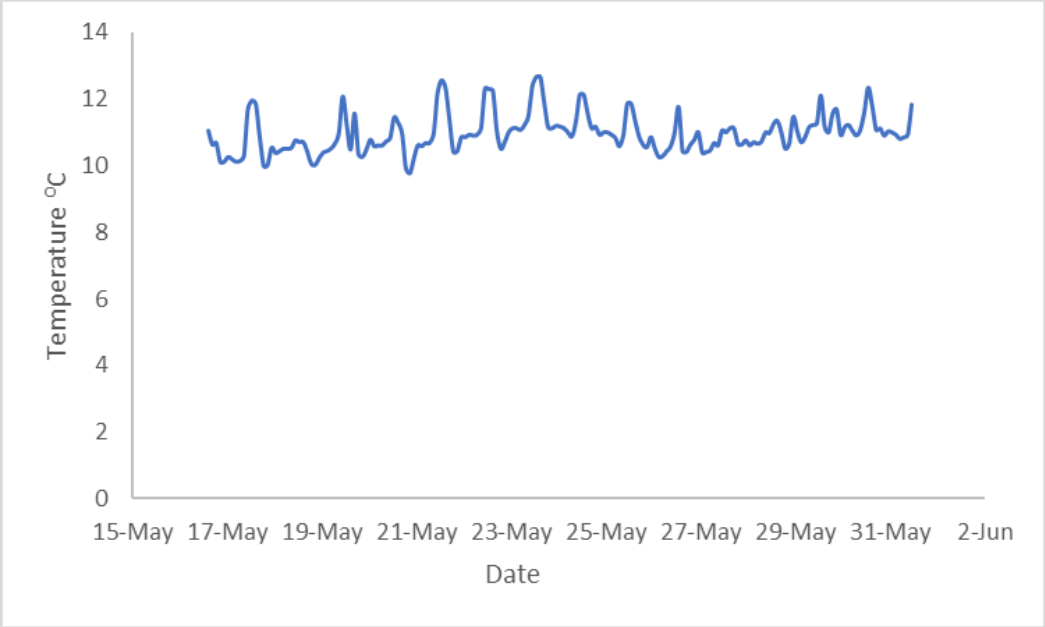


Figure 52. Temperature at RST (Dexter Dam)

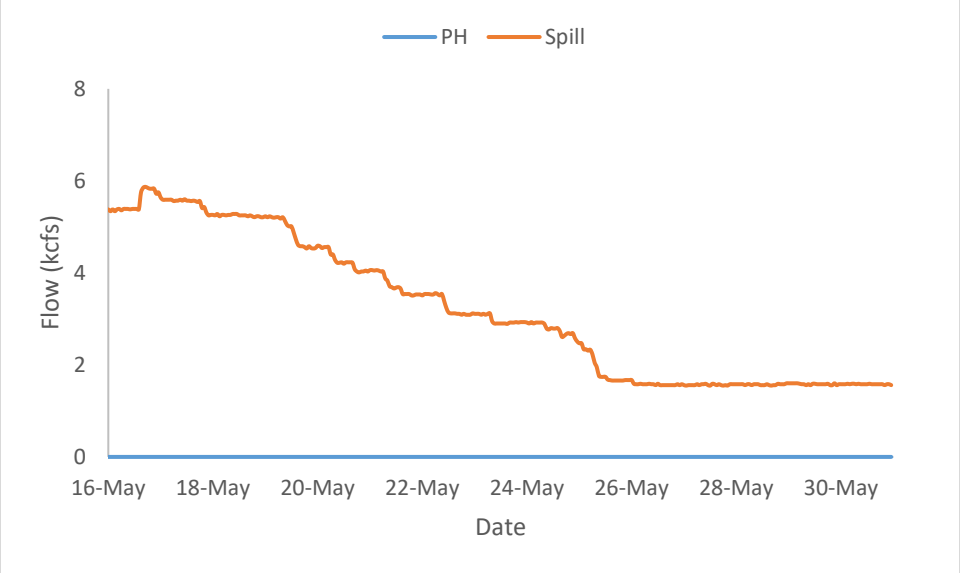


Figure 53. Hourly Flows PWR vs. Spill (Dexter Dam)

Middle Fork Willamette – Lookout Dam Tailrace

Target Species

The reporting period began May 16 and ended May 31. 7 Chinook salmon were captured during the 16-day sampling period (Figure 54). The traps were operated 100% of the reporting period. Table 36

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 55 shows length frequency data to-date.

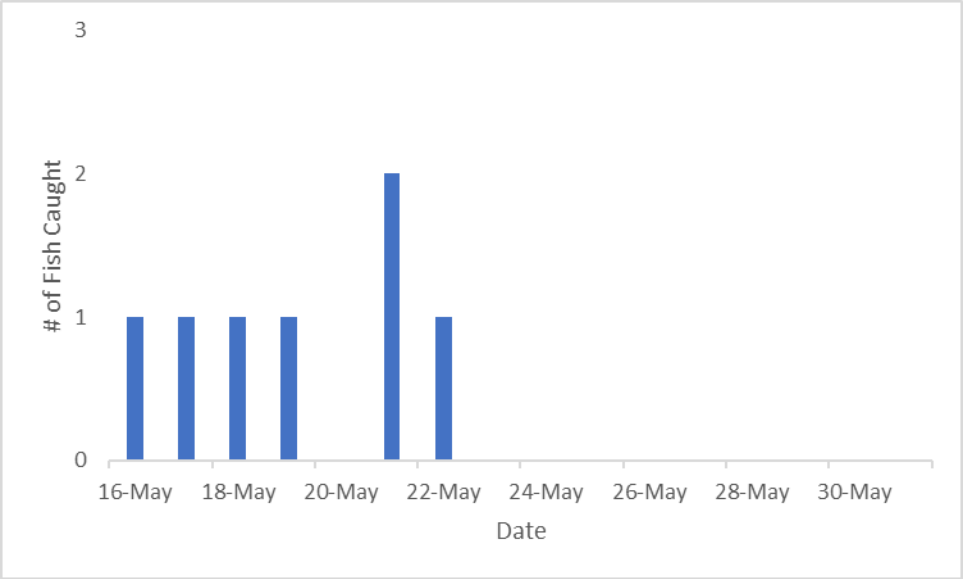


Figure 54. Chinook Captured Per Day 05/16/2022 to 05/31/2022 (Lookout Point Dam Tailrace)

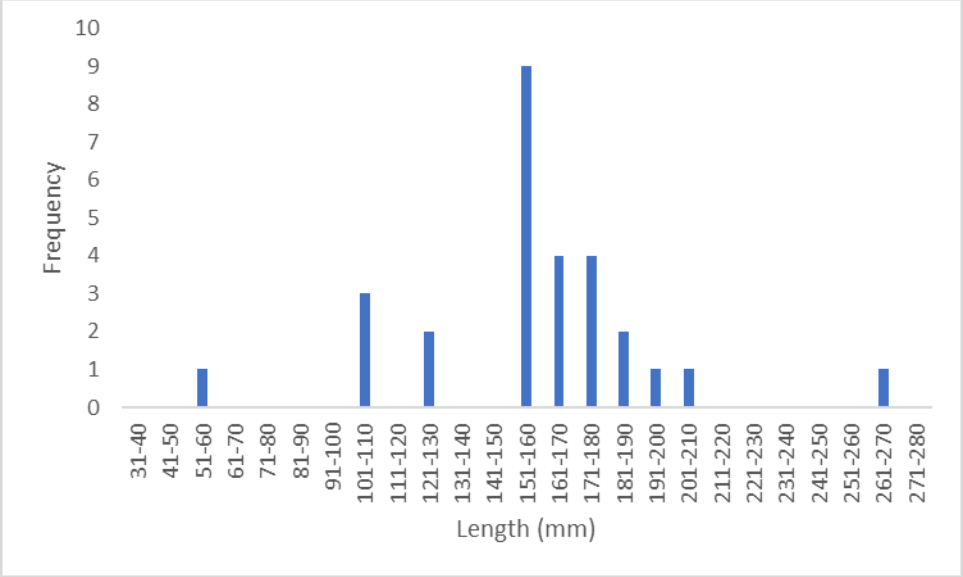


Figure 55. Length Frequency of Juvenile Chinook Sampled Season To-Date (Lookout Point Dam Tailrace)

Table 36. Descriptive Statistics of Target Species Captured at Lookout Point Dam Tailrace, 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 Dam	PH 1	CHS	Smolt	12	154	266	180.8	42.1	108.9	66.0	
		CHS	Parr	1	107	107	107	5.3	5.3	5.3	
		CHS	Fry	0	0	0	0	0	0	0	
	PH 2	CHS	Smolt	0	0	0	0	0	0	0	
		CHS	Parr	2	58	108	83.0	2.2	13.4	7.8	
		CHS	Fry	0	0	0	0	0	0	0	
	Spill	CHS	Smolt	12	124	194	157.4	19.7	63.0	43.1	
		CHS	Parr	1	104	104	104	13.5	13.5	13.5	
		CHS	Fry	0	0	0	0	0	0	0	

May 16-31, 2022											
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*			
					Min	Max	Mean	Min	Max	Mean	
Lookout Point Dam	PH 1	CHS	Smolt	2	160	176	168.0	42.1	53.3	47.7	
		CHS	Parr	0	0	0	0	0	0	0	
		CHS	Fry	0	0	0	0	0	0	0	
	PH 2	CHS	Smolt	0	0	0	0	0	0	0	
		CHS	Parr	2	58	108	83.0	2.2	13.4	7.8	
		CHS	Fry	0	0	0	0	0	0	0	
	Spill	CHS	Smolt	3	130	157	146.0	25.4	44.9	35.3	
		CHS	Parr	0	0	0	0	0	0	0	
		CHS	Fry	0	0	0	0	0	0	0	

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

24-Hour Post Collection Holding Trial

A total of 4 Chinook captured in the RSTs was held during this reporting period. 2 fish were held from the PWR RST and 2 fish were held from the Spill RST. 2 hold fish died from the PWR RSTs (1 from PH 1 and 1 from PH 2) (100%). 0 of the fish from Spill RST died during holding (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 3 Chinook captured in the Spill Channel RST. Partial descaling <20% was observed on 2 of 3 Chinook collected at the Spill RST (66.7%), and descaling >20% was observed on 1 of 3 Chinook collected at the Spill RST (33.3%). Of the 3 Chinook captured in the Spill RST all 3 displayed body injuries (100%) and 1 had eye injuries (33.3%). None of the Spill RST Chinook had copepods present in the branchial cavity (0%) and none had copepods present on fins (0%). None of the fish captured in the Spill RST displayed Gas Bubble Disease (0%).

There were 4 Chinook captured in the Powerhouse channel RST. Partial descaling <20% was observed on 2 of the 4 Chinook collected at the PWR RST (50%). Descaling >20% was observed on 1 of the 4 Chinook collected at the PWR RST (25%). All 4 PWR RST fish had bodily injury (100%) and 1 had eye injuries (25%). None of the fish had copepods present in the branchial cavity (0%) and none had copepods present on fins (0%). No fish displayed Gas Bubble Disease (0%). There was 1 chinook mortality collected in the Spill RST (33.3%) and 2 in the PWR RST (50%). Injuries are displayed in Table 37. To date injury data can be found in Appendix A.

Table 37. 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	4	2	2	4	1	0	0	2
	Spill	3	2	1	3	1	0	0	1

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

Non-Target Species

20 non-target species were captured during the reporting period; the data is summarized below in Table 38.

Table 38. Summary of Non-target Species (Lookout Point Dam Tailrace).

Species	PWR Capture	PWR Mortality	Spill Capture	Spill Mortality	Season Total	Season Total Mortality
Bluegill	0	0	0	0	1	0
Lamprey	0	0	0	0	0	0
Bullhead	0	0	0	0	1	0
Bull Trout	0	0	0	0	0	0
Crappie	0	0	0	0	4	1
Cutthroat Trout	0	0	0	0	1	0
Longnose Dace	0	0	0	0	0	0
Red-Sided Shiner	0	0	0	0	0	0
Sculpin	7	1	1	0	11	1
Smallmouth Bass	3	0	1	1	41	11
Sucker	5	2	1	0	14	5
Whitefish	0	0	0	0	0	0
O. mykiss	2	1	0	0	3	1
O. mykiss (clipped)	0	0	0	0	1	1
Chinook (clipped)	1	0	0	0	4	0
Totals	**18**	**4**	**3**	**1**	**81**	**20**

Stream Statistics

Basic stream statistics at Lookout Dam Tailrace site were calculated from data downloaded from the U.S. Geological Survey stream gage number 14149010. Total dissolved gas saturation or dissolved oxygen concentration measurements are not available at this stream gage site, or any nearby stream gages. Gage height (feet) is the only metric provided at this gage. During the reporting period, daily maximum values for instantaneous gage height ranged from 692.0 feet to 694.4 feet (mean: 693.0 feet). Figure 56 shows instantaneous gage height.

Stream temperatures were recorded using both temperature probes and daily with handheld thermometers for the Lookout Dam Tailrace RST site during this reporting period. Temperature was taken during daily site visits and was used to formulate figure data for PWR and Spill until the 28th when probes were deployed (figures 57 and 58).

Flows through the Powerhouse and Spill during the reporting period averaged 607.4 and 2,434.3 cubic feet per second (cfs) respectively (Figure 59). Catch per unit of effort (CPUE) data are summarized in Table 39. Discharge and capture data for the duration of monitoring efforts at this location are provided in Appendix B.

Table 39. Summary of Chinook CPUE at Lookout Point Dam Tailrace.

	Chinook		
Description	**PH 1**	**PH 2**	**Spill**
Catch	2	2	3
Effort (hrs)	384.9	385.0	385.1
CPUE (fish/hr)	0.005	0.005	0.008

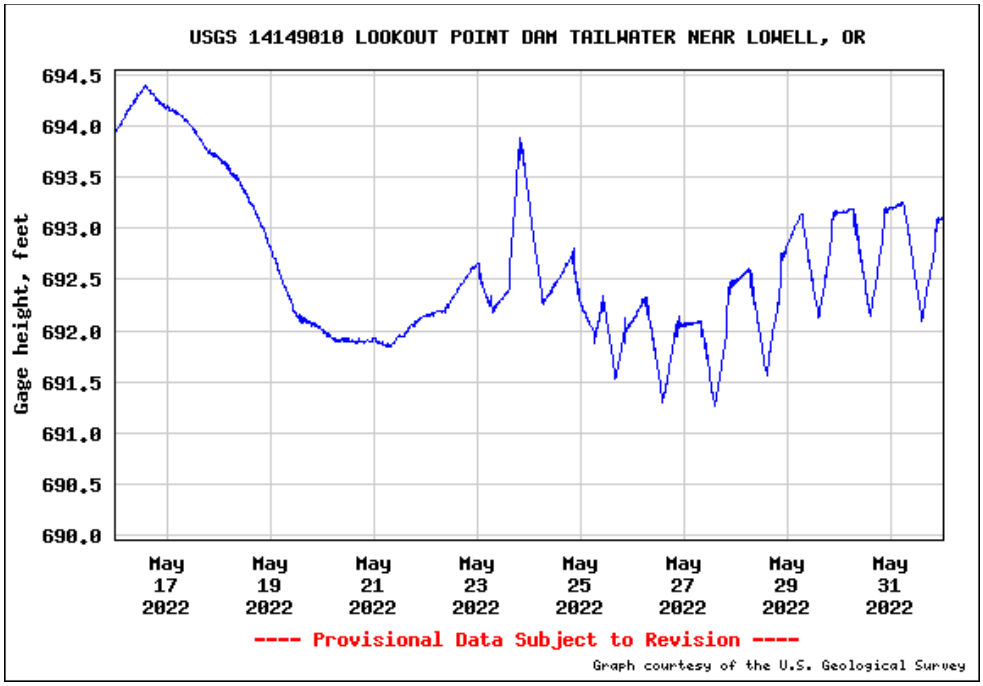


Figure 56. Gage Height (feet); below Lookout Dam

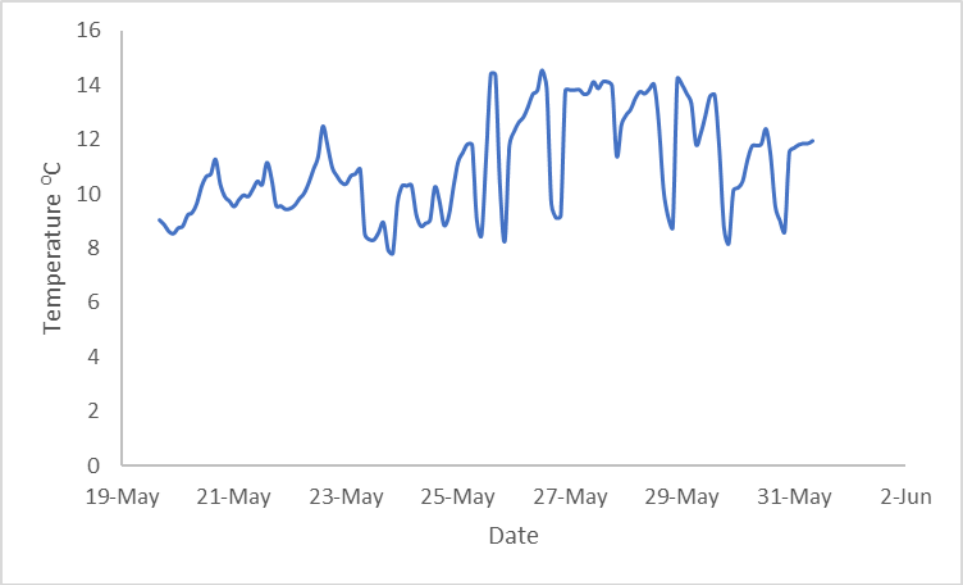


Figure 57. Temperature at RST (Lookout Dam PWR)

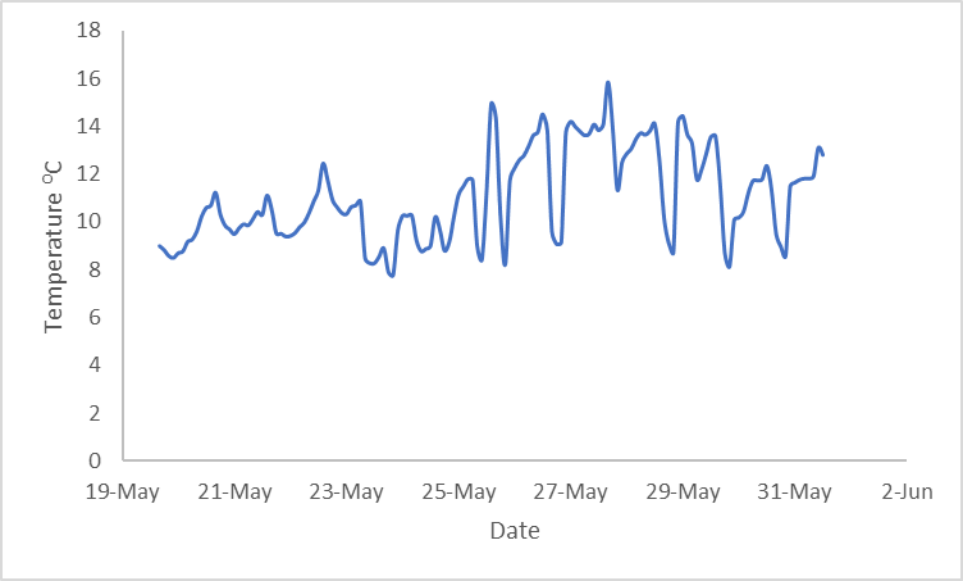


Figure 58. Temperature at RST (Lookout Dam Spill)

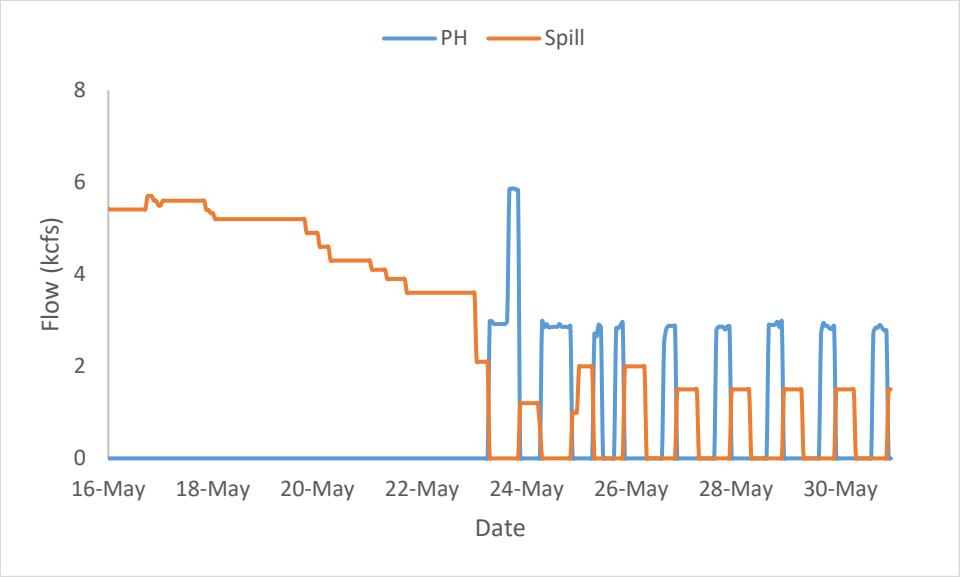


Figure 59. Hourly Flows PWR vs. Spill (Lookout Dam Tailrace)

Middle Fork Willamette – Lookout Point Head of Reservoir

Target Species

The reporting period began May 16 and ended May 31. 8 Chinook salmon were captured during the 16-day sampling period (Figure 60). The trap was put into the non-sampling position from the 14th to the 16th and the 28th to the end of the reporting period due to high flows and debris load causing trap and fish safety concerns. The trap was operated 81% of the reporting period. Table 40 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 61 shows length frequency data to-date.

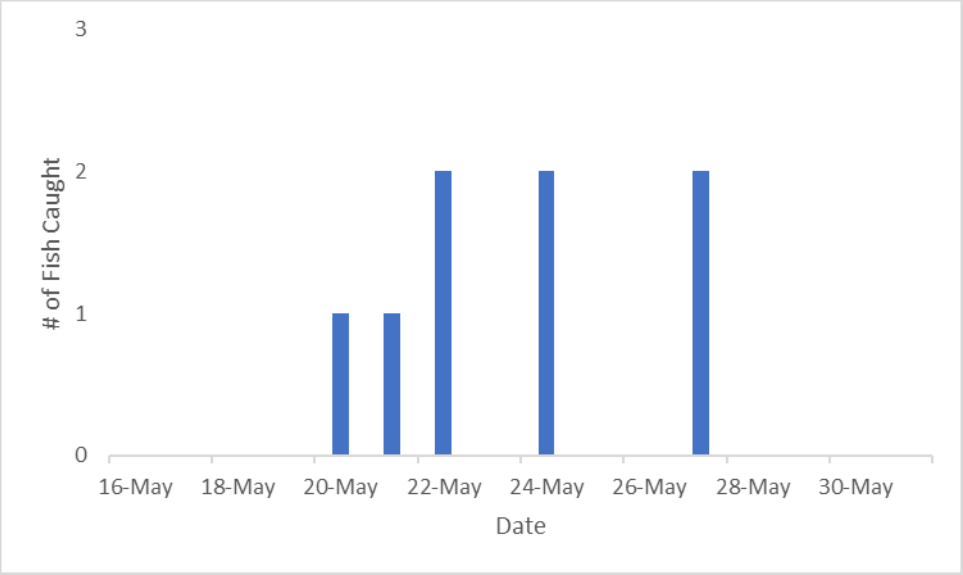


Figure 60. Chinook Captured Per Day 05/16/2022 to 05/31/2022 (Lookout Point Head of Reservoir)

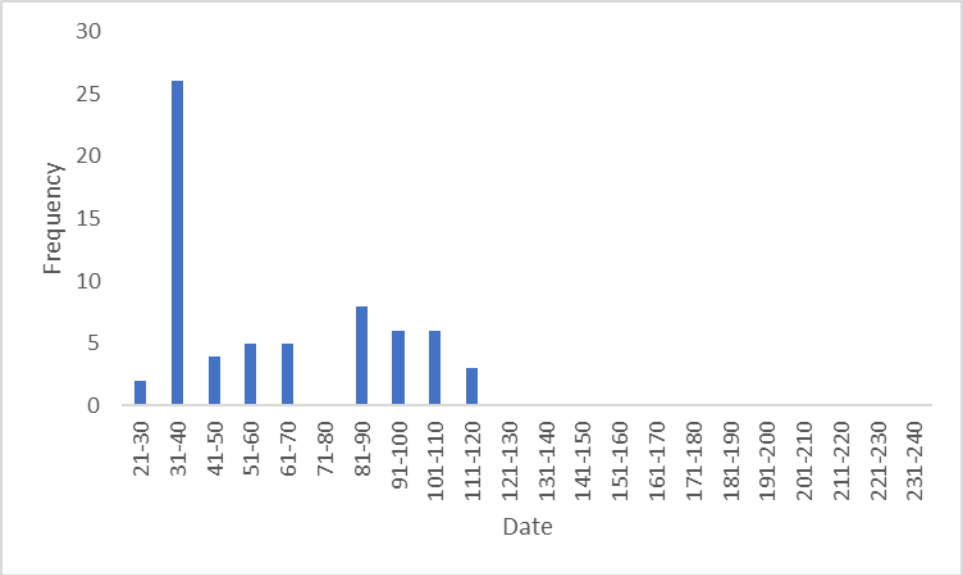


Figure 61. Length Frequency of Juvenile Chinook Sampled Season To-Date (Lookout Point Head of Reservoir)

Table 40. 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	0	0	0	0	0	0	0	
		CHS	Parr	31	51	115	87.6	1.0	19.8	7.5	
		CHS	Fry	34	28	69	37.4	N/A	N/A	N/A	
May 16-31, 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	0	0	0	0	0	0	0	
		CHS	Parr	5	51	68	59.6	1.0	3.2	1.8	
		CHS	Fry	3	38	69	55.3	1.2	3.3	2.4	

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

Trapping Efficiency

A total of 1007 juvenile hatchery Chinook (parr) were bismarck brown dyed and adipose clipped and released on 05/24/2022 above the Lookout Point Head of Reservoir trap. Fish were released in small groups to evaluate the traps efficiency capturing fish migrating downstream. 125 fish were recaptured in the 5-foot RST for an efficiency of 12.4%.

Of the 125 fish recaptured, 2 were dead. Injuries were descaling, body injury, and fin damage.

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

Injuries and Copepod Infection

There were 8 Chinook captured during this reporting period. Of these 8 fish, 1 had partial descaling <20% (12.5%) and 1 had body injuries (12.5%). No other injuries were observed. Injury data for the reporting period is shown in table 41. To date data can be found in Appendix A.

Table 41. 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	8	1	0	1	0	0	0	0

Head of Reservoir								

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

Collected DNA and Scale Samples

Scales and DNA were collected from five Chinook captured for the reporting period. All other target fish were under sampling minimum thresholds (45 mm FL for DNA and 50 mm FL for scales).

Non-Target Species

21 non-target species were captured during the reporting period; the data is summarized below in Table 42.

Table 42. Summary of Non-target Species (Lookout Point Head of Reservoir).

Species	8ft Capture	8ft Mortality	Season Total	Season Total Mortality
Bluegill	0	0	1	0
Lamprey	0	0	0	0
Bullhead	0	0	0	0
Bull Trout	0	0	0	0
Crappie	0	0	0	0
Cutthroat Trout	2	0	7	0
Longnose Dace	6	0	9	0
Red-Sided Shiner	0	0	2	0
Sculpin	4	1	5	2
Smallmouth Bass	1	0	6	0
Sucker	2	0	9	1
Whitefish	0	0	0	0
Pikeminnow	1	0	1	0
O. mykiss	5	0	39	1
O. mykiss (clipped)	0	0	1	0
Totals	**21**	**1**	**80**	**4**

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 gage number 14148000. During the reporting period, daily maximum values for instantaneous discharge ranged from 2,850.0 cfs to 7,030.0 cfs (mean: 4,762.5 cfs). Figure 62 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 63)

Flows into Lookout Point Reservoir averaged 4,352.4 cfs (Figure 64). Catch per unit of effort (CPUE) data are summarized in Table 43. Discharge and capture data for the duration of monitoring efforts at this location are provided in Appendix B.

Table 43. Summary of Chinook CPUE at Lookout Point Head of Reservoir.

	Chinook
Description	5 ft
Catch	8
Effort (hrs)	287.5
CPUE (fish/hr)	0.028

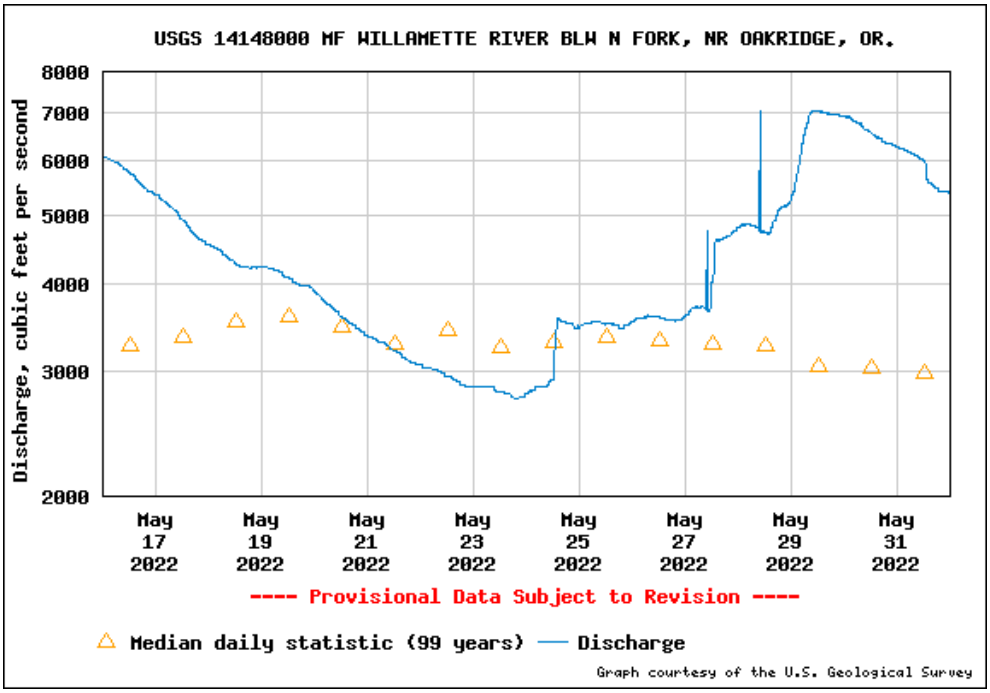


Figure 62. Discharge (cfs); above Lookout Point Reservoir, Below Oakridge, OR

Note: Hobo logger was ripped off trap during reporting period. Temperature supplemented with USGS stream gage number 14148000, 5.4 rkms downstream.

Figure 63. Temperature at RST (Lookout Point Head of Reservoir)

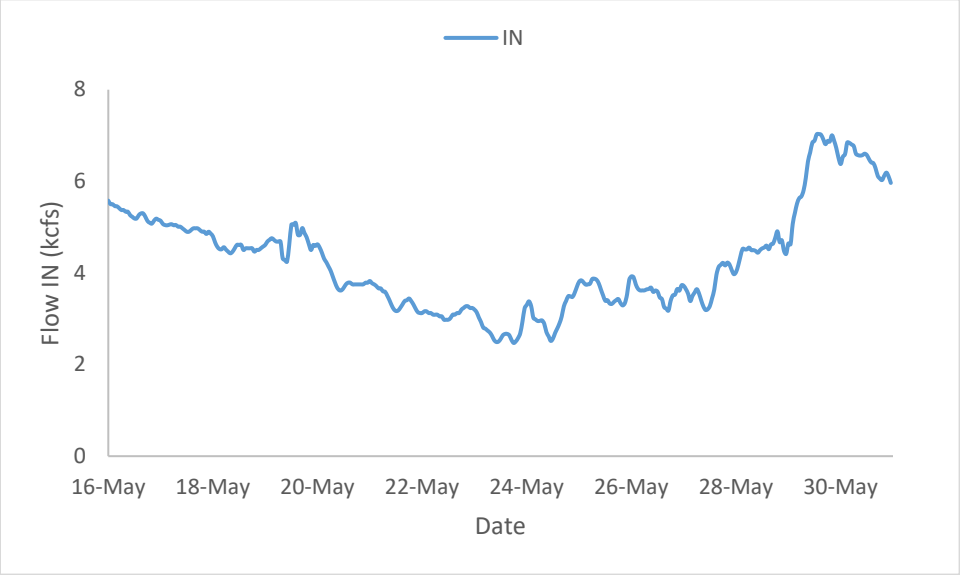


Figure 64. Hourly Flows (Lookout Point Head of Reservoir site)

Issues Encountered

A significant rain event resulted in very high flows at most sites that resulted in sampling outages.

Upcoming USACE Support Services

None at this time.

Appendix A

Chinook (CHS)

Injuries During Reporting Period (5-16-2022 to 5-31-2022)																							
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	45		31		7			33	5		16		1		1		4	1	5	4	2	3	3
8 ft	45		31		7			33	5		16		1		1		4	1	5	4	2	3	3
Smolt	41		31		6			33	5		16		1		1		4	1	5	4	2	3	3
Fry	4				1																		
Cougar Dam HOR	72										1								1	1			
5 ft	72										1								1	1			
Fry	72										1								1	1			
Cougar Dam	94	7	29	1	3			33	16		14						2	5	3	3	1	1	2
RO	27		13		3			17	6		9						1		2	3			1
Parr	6		2					3	3		5								2				
Smolt	15		11		2			14	3		4						1			2			1
Fry	6				1															1			
PH	67	7	16	1				16	10		5						1	5	1		1	1	1
Parr	7		4					5	2		1								1				
Smolt	20		11	1				11	6		3						1	2			1	1	1
Fry	40	7	1						2		1							3					
Dexter Dam Tail.	9		5					2	4		7							1	2	1	1		2
5 ft	9		5					2	4		7							1	2	1	1		2
Parr	1							1	1		1								1	1			
Smolt	8		5					1	3		6							1	1		1		2
Lookout Dam Tail.	7		7		2				3		7						1	1	1	1			
PH 1	2		2						1		2								1				
Smolt	2		2						1		2								1				
PH 2	2		2		1				1		2						1	1		1			
Parr	2		2		1				1		2						1	1		1			
Spill	3		3		1				1		3												
Smolt	3		3		1				1		3												
Lookout Point HOR	8		1								1												
5 ft	8		1								1												
Parr	5		1								1												
Fry	3																						

Chinook (CHS)

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	446		250	1	61	2		379	120	1	232	5	10	2	21	5	39	14	58	42	17	10	14
8 ft	446		250	1	61	2		379	120	1	232	5	10	2	21	5	39	14	58	42	17	10	14
Parr	19		5			1		13	1		3					2			1				
Smolt	419		245	1	60	1		366	119	1	229	5	10		21	3	39	14	57	42	17	9	14
Unknown	2													2								1	
Fry	6				1																		
Foster Dam HOR	61		6		1						1												
5 ft	61		6		1						1												
Parr	4		2																				
Smolt	3		3								1												
Fry	54		1		1																		
Cougar Dam	1174	10	464	3	81	5	3	486	129	3	256	2	4	2	17	2	32	25	66	39	21	7	24
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	793	10	252	1	21	3		234	50		105		4	2	11		13	16	24	14	12	4	3
Parr	231		127		11	1		96	19		51		1		5		3	3	10	5	5		
Smolt	189		123	1	6	2		138	25		49		3		5		8	6	11	6	7	1	3
Unknown	2													2									
Fry	371	10	2		4				6		5				1		2	7	3	3		3	
Cougar Dam HOR	422		22					3			11								5	4	1		
5 ft	422		22					3			11								5	4	1		
Parr	36		21					3			6										1		
Fry	386		1								5								5	4			
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.	25		17		3			4	8		18						3	2	3	3	3		5
5 ft	25		17		3			4	8		18						3	2	3	3	3		5
Parr	1							1	1		1								1	1			
Smolt	24		17		3			3	7		17						3	2	2	2	3		5
Lookout Dam Tail.	28		12	1	7			6	14		19				2	1	6	1	4	2	2		3
PH 1	13		3	1	4			5	9		10				2	1	4		4				
Parr	1																						
Smolt	12		3	1	4			5	9		10				2	1	4		4				
PH 2	2		2		1				1		2						1	1		1			
Parr	2		2		1				1		2						1	1		1			
Spill	13		7		2			1	4		7						1			1	2		3
Parr	1								1														
Smolt	12		7		2			1	3		7						1			1	2		3
Lookout Point HOR	65		14					1			6						1						
5 ft	65		14					1			6						1						
Parr	31		14					1			6						1						
Fry	34																						

Steelhead (O. mykiss)

Injuries During Reporting Period (5-16-2022 to 5-31-2022)																							
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		1					1	1		2				1		1	2	1	2			
8 ft	2		1					1	1		2				1		1	2	1	2			
Smolt	2		1					1	1		2				1		1	2	1	2			
Foster Dam HOR	4		2								1												
5 ft	4		2								1												
Parr	4		2								1												

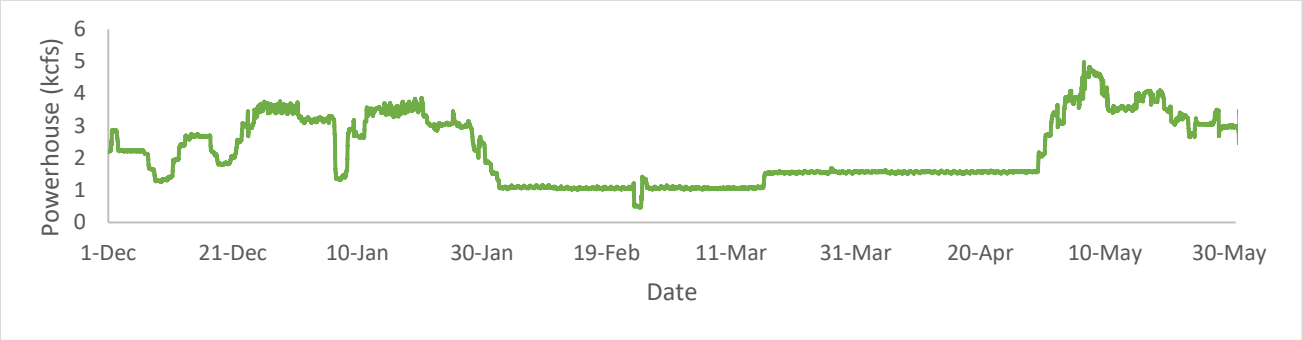
Steelhead (O. mykiss)

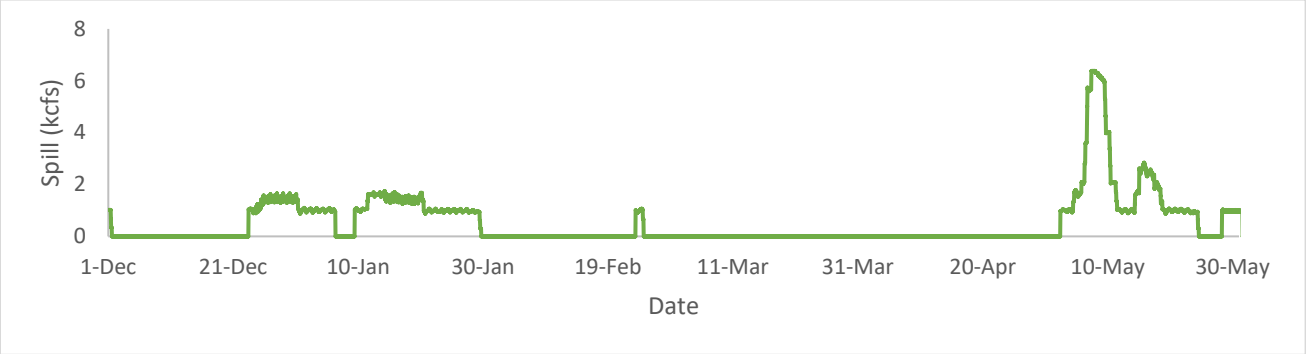
Injuries to-date																							
Site/Trap/Life Stage	Total Fish	MUNK	DS<2	BLO	EYB	FUN	BKD	COP	DS>2	PRD	FID	HBO	BO	HO	BVT	HBP	BRU	TEA	OPD	HIN	FVB	POP	GBD
Big Cliff Dam	12		7					8	3		6				1		3	2	3	4			
8 ft	12		7					8	3		6				1		3	2	3	4			
Parr	1																						
Smolt	11		7					8	3		6				1		3	2	3	4			
Green Peter Tail.	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 HOR	88		25					1			11							1					
5 ft	88		25					1			11							1					
Adult	7		1								2												
Parr	17		7					1			2												
Smolt	35		17								7							1					
Fry	29																						

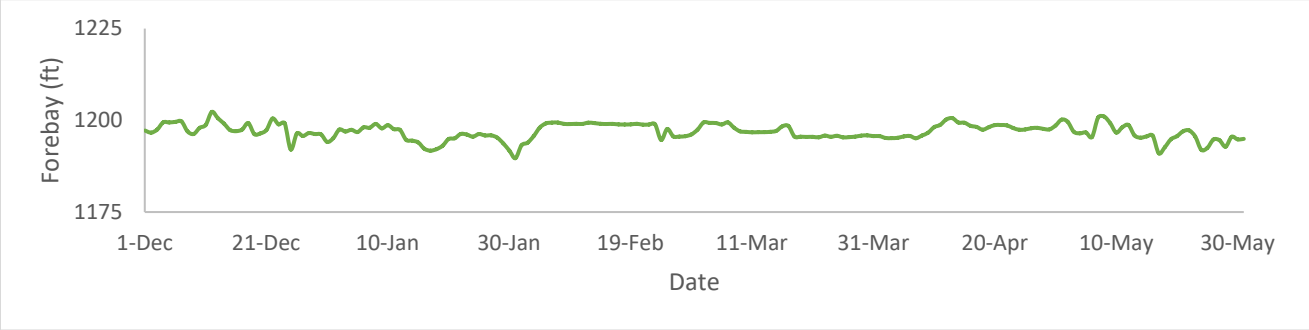
Injury Code	Description of Injury/Condition
NXI	Live fish with no external injuries
MUNK	Mortality with no external injuries
DS<2	Descaling <20%
BLO	Bloated
EYB	Bloody Eye (hemorrhage)
BVT	Bleeding from Vent
FVB	Fin Blood Vessels Broken
GBD	Gas Bubble Disease (fin ray/eye inclusions)
POP	Pop Eye (eye popping out of head)
HIN	Head Injury
OPD	Opercle 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

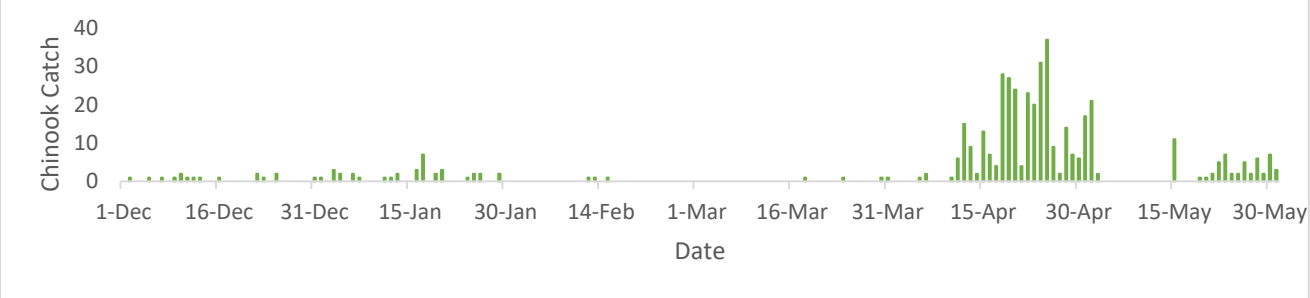
Appendix B

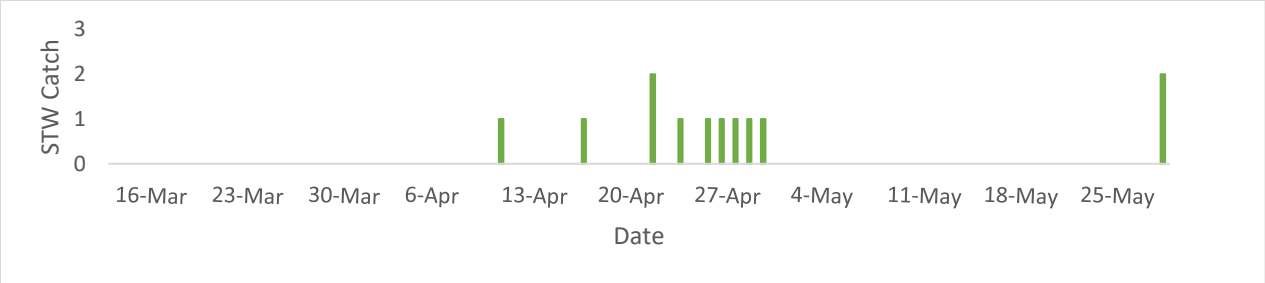
Big Cliff Dam Operational and Capture Data Since Start of Monitoring



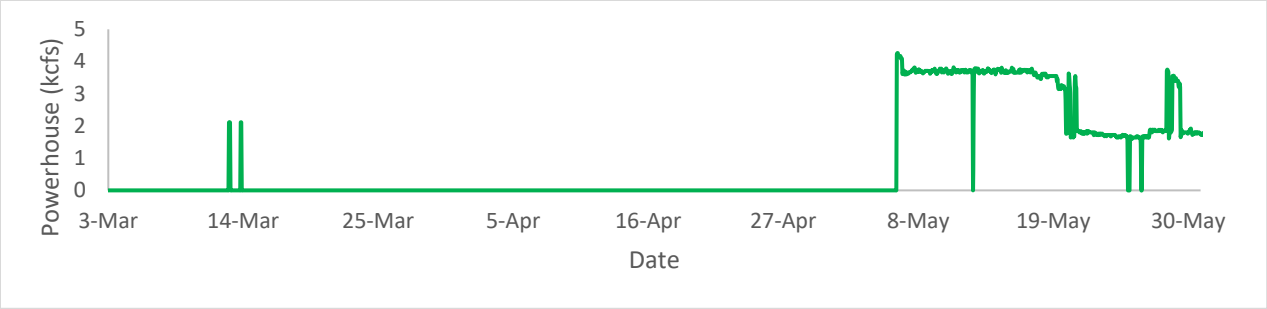


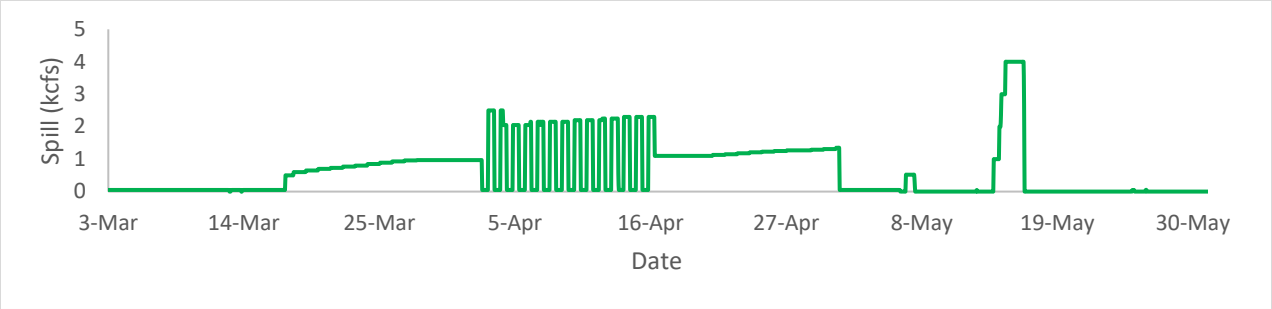


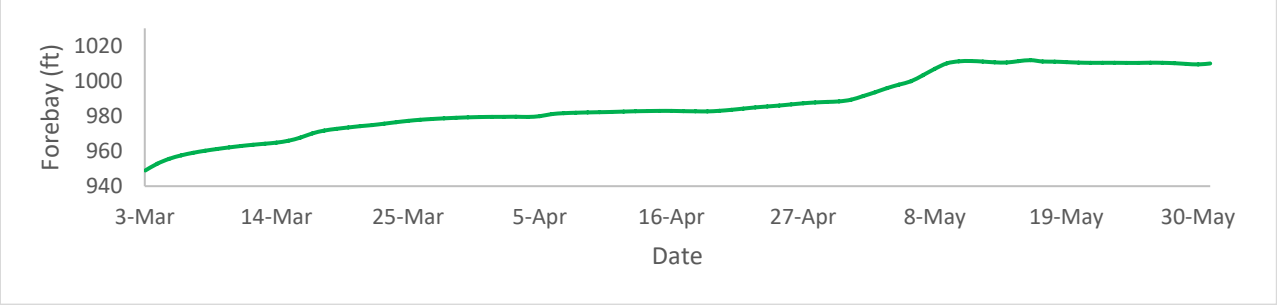


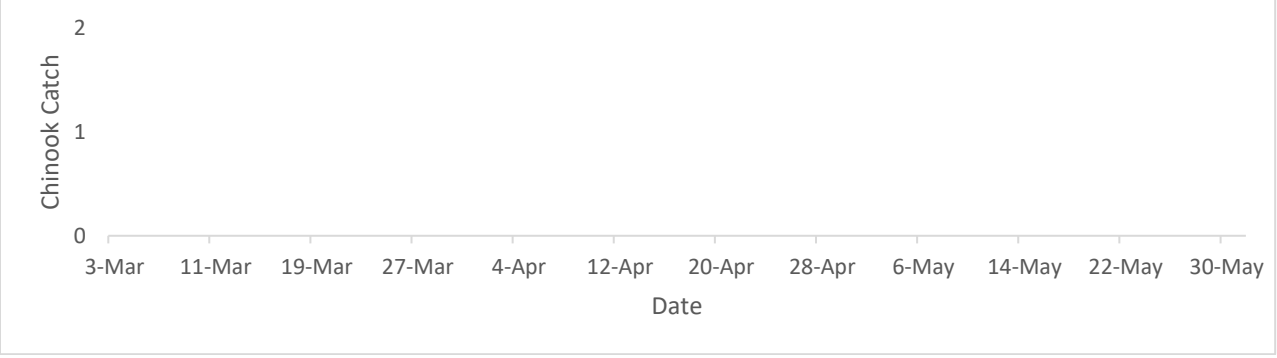


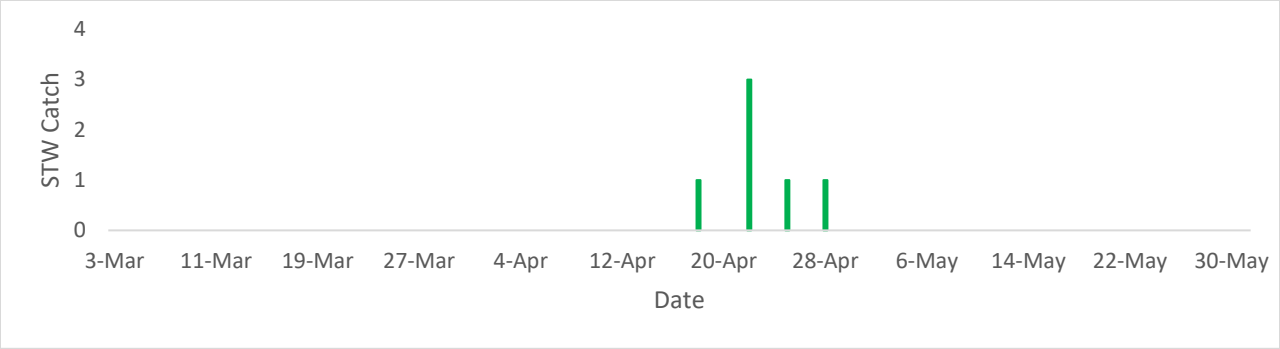
Green Peter Dam Operational and Green Peter Tailrace- Middle Santiam River Capture Data Since Start of Monitoring



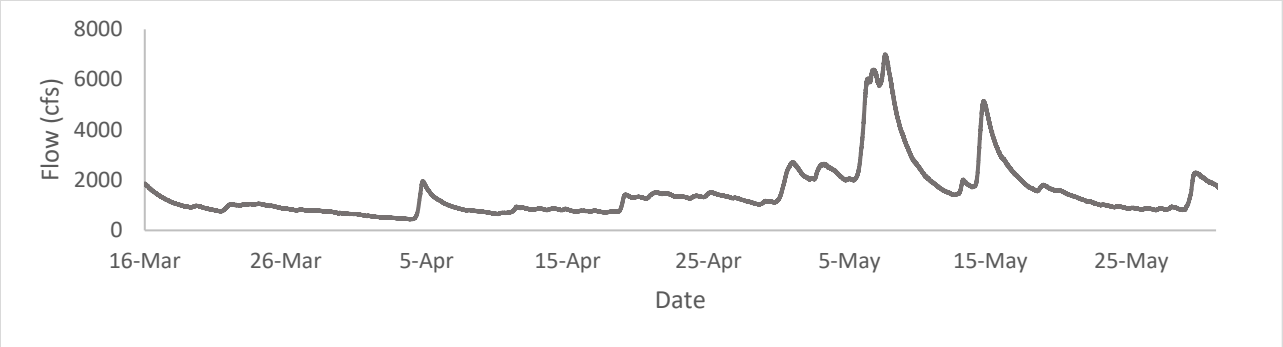




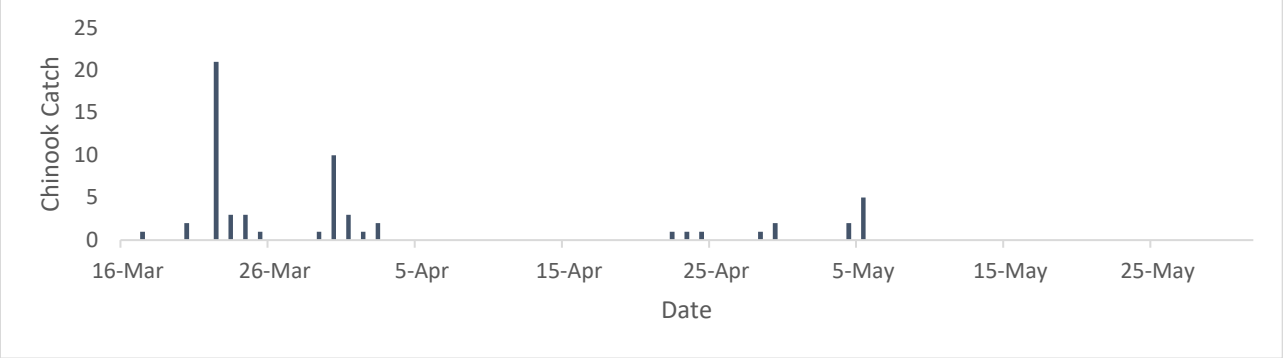


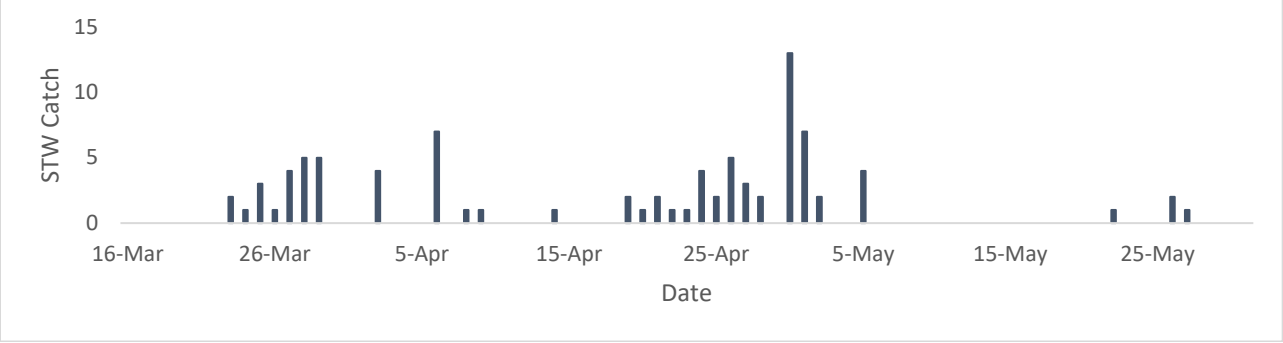


South Santiam River Above Foster Dam Discharge and Foster Dam Head of Reservoir Capture Data

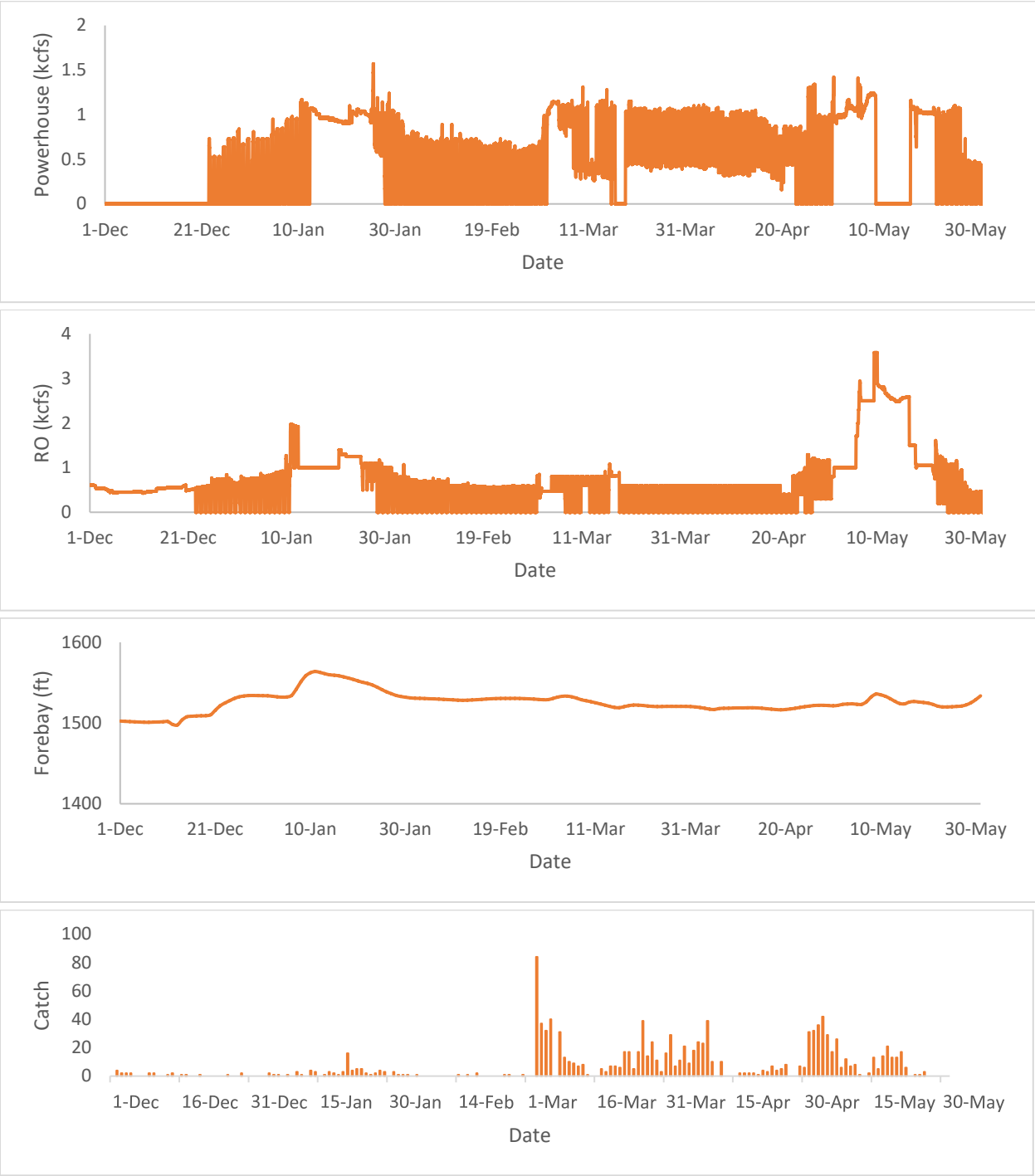


Note: Discharge data was taken from USGS gage site number 14185000, 250 meters upstream.

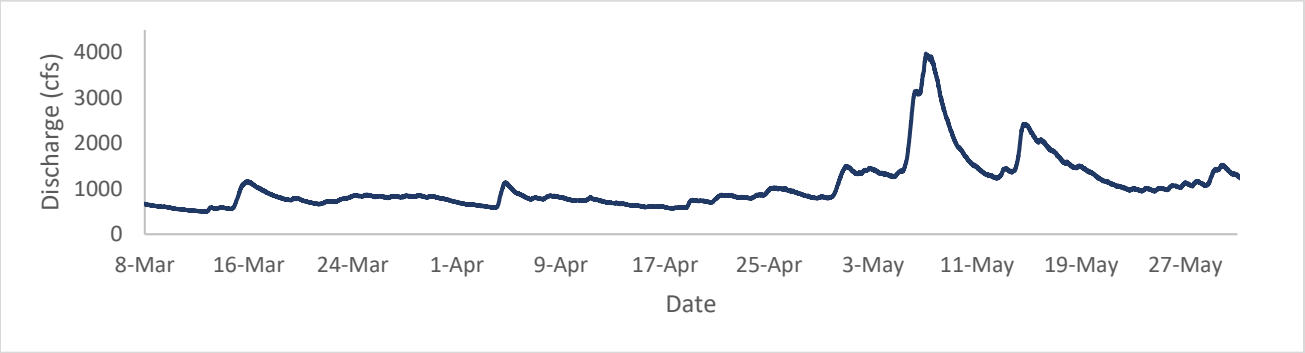




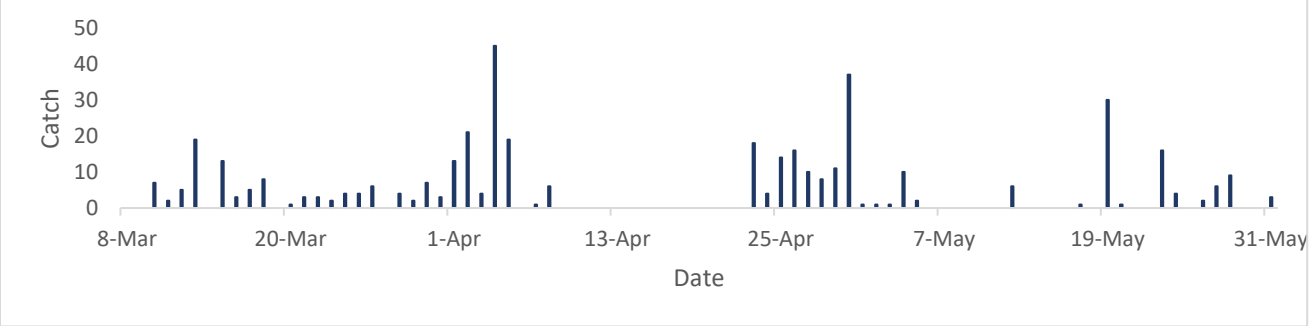
Cougar Dam Operational and Capture Data Since Start of Monitoring



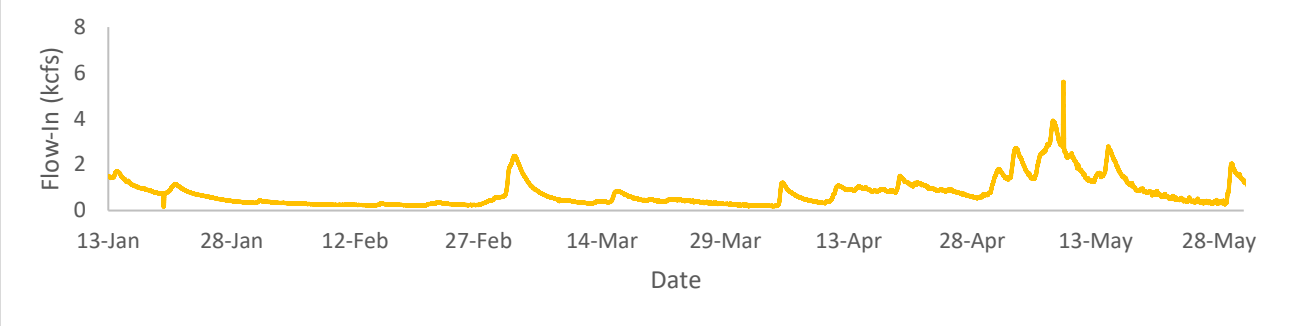
South Fork McKenzie above Cougar Dam Discharge and Cougar Dam Head of Reservoir Capture Data Since Start of Monitoring

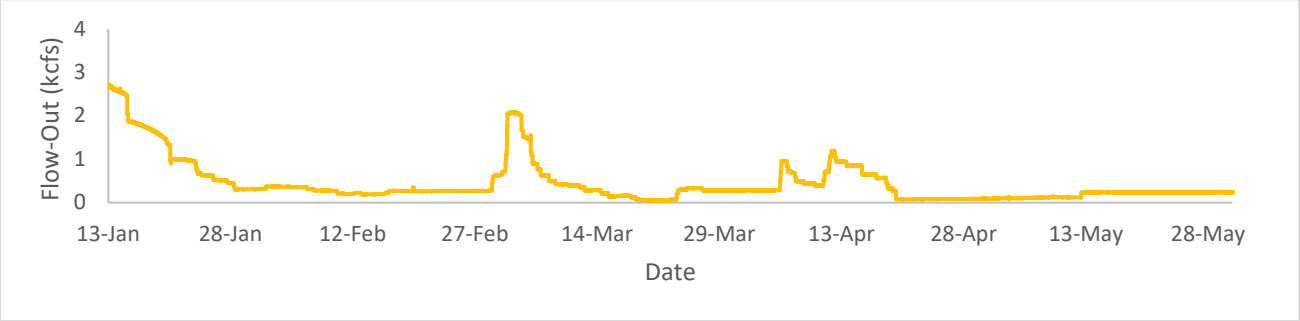


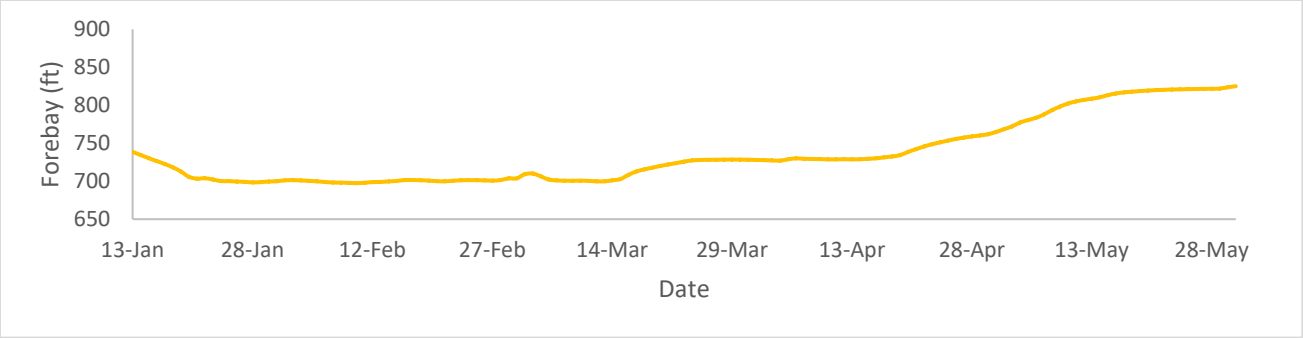
Note: Discharge data was taken from USGS gage site number 14159200, 250 meters upstream.



Fall Creek Dam Operational and Capture Data Since Start of Monitoring

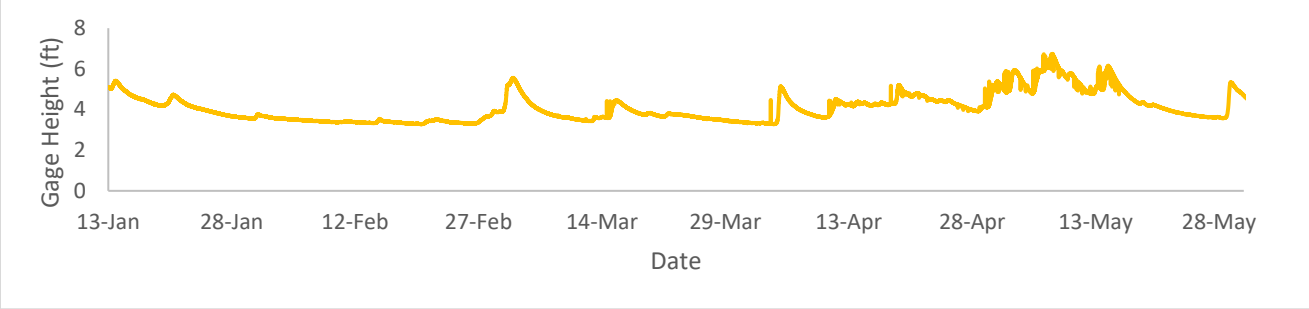




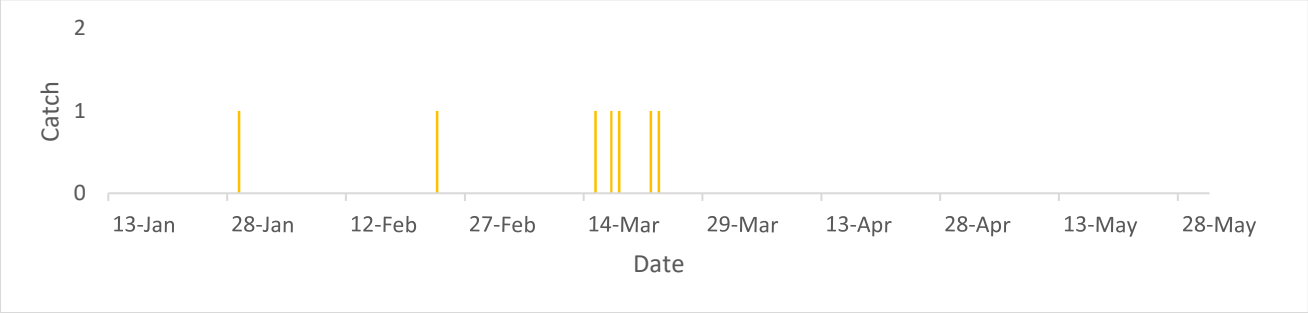


Note: Operational data was being tracked for Fall Creek Head of Reservoir site prior to initiation of Fall Creek Dam monitoring.

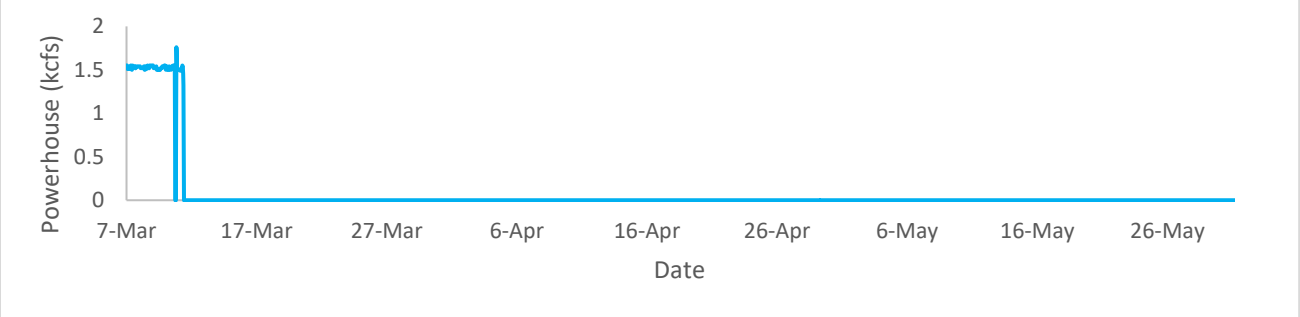
Fall Creek Head of Reservoir Operational and Capture Data Since Start of Monitoring

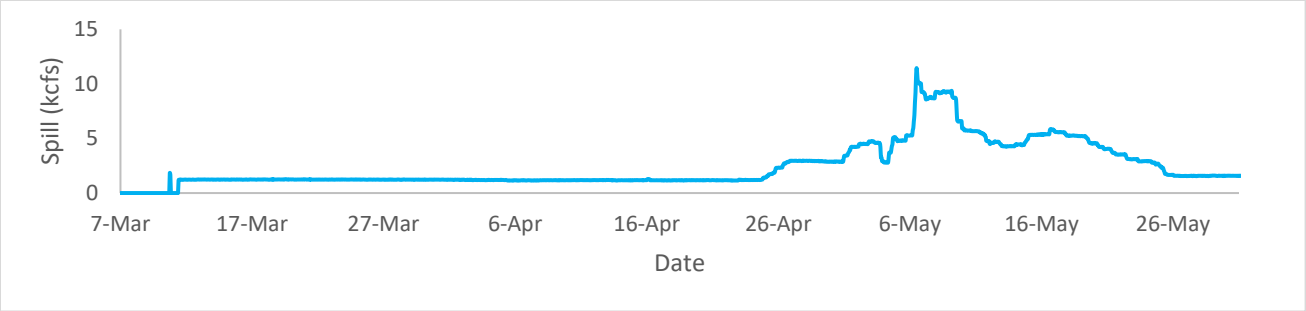


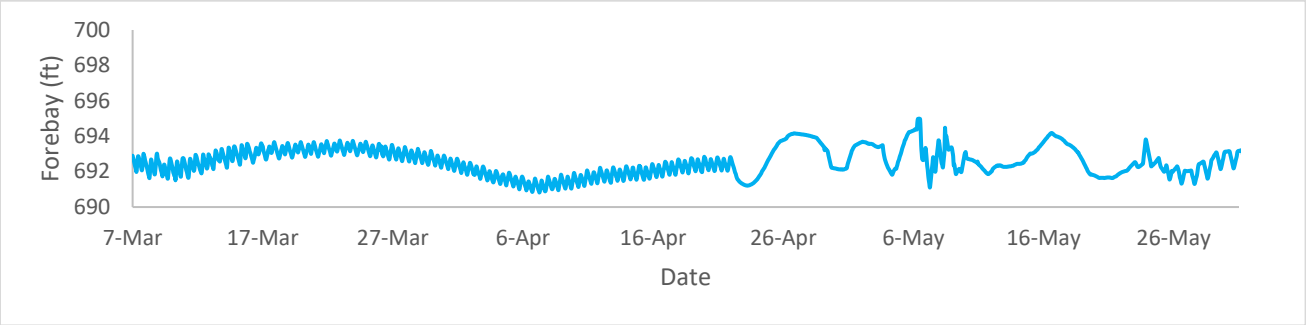
Note: Gage height data was taken from USGS stream gage number 14150290, 1.2 rkms downstream.

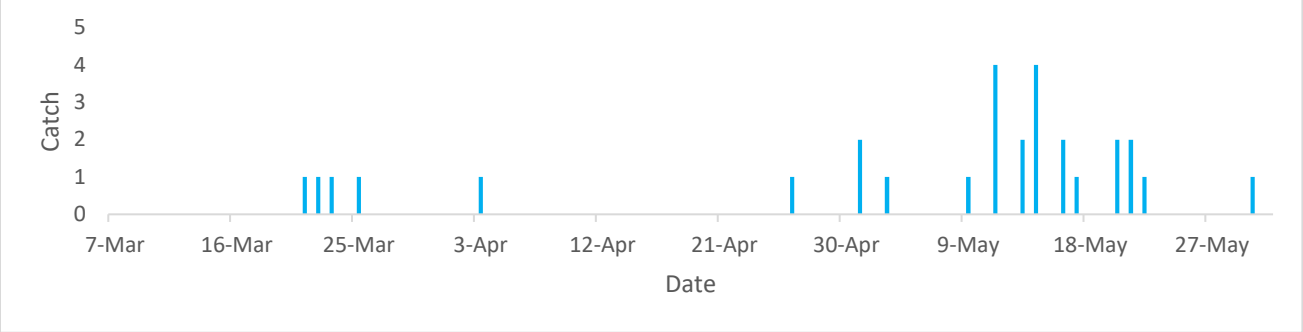


Dexter Dam Operational and Capture Data Since Start of Monitoring

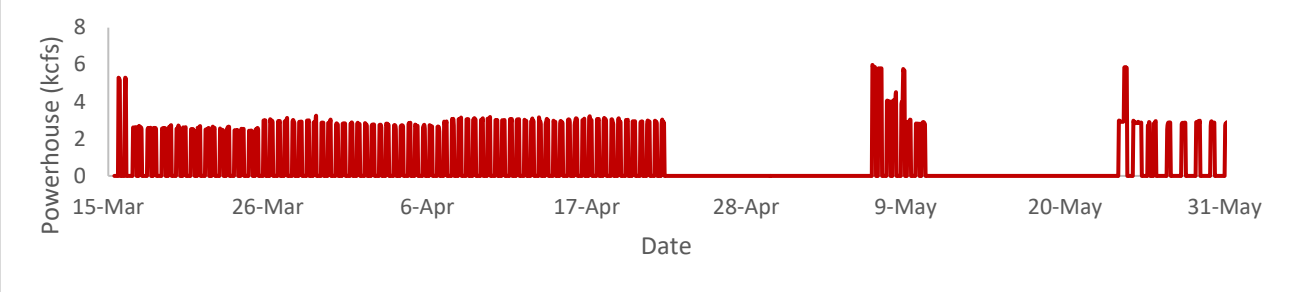


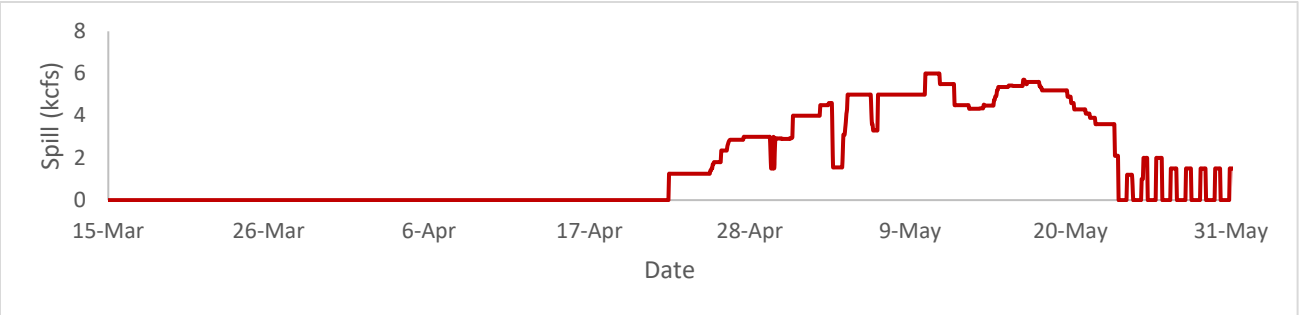


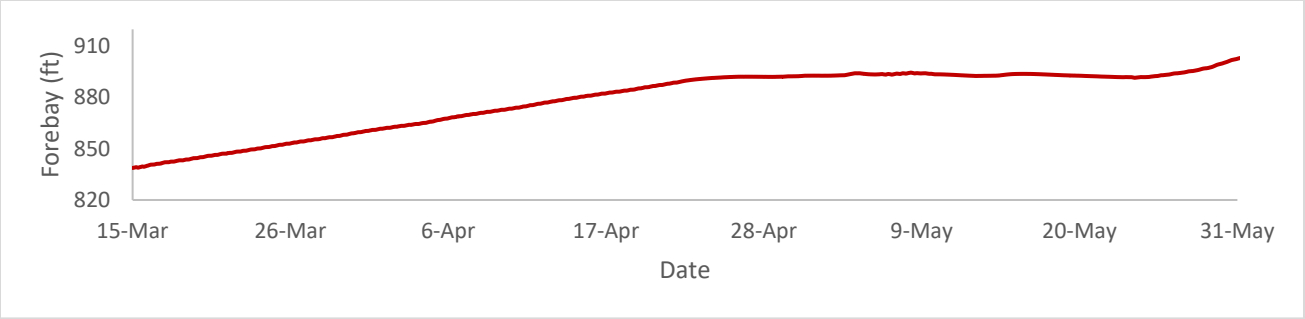


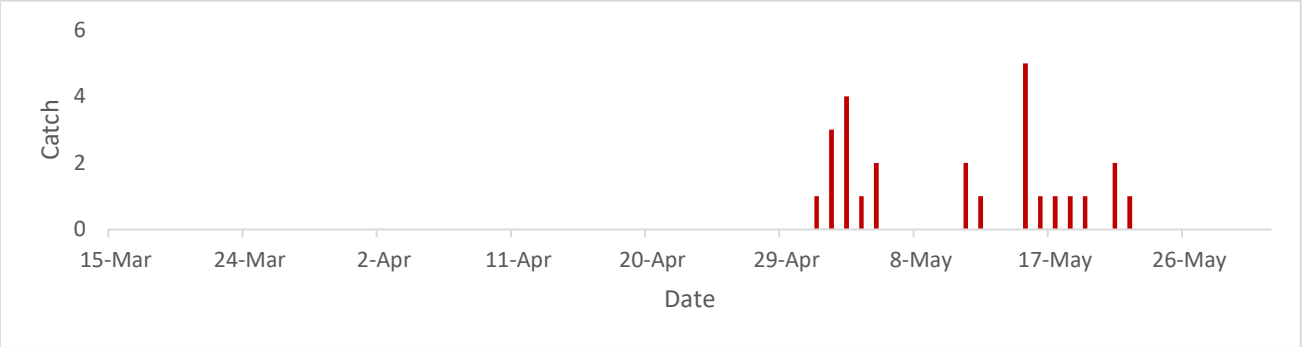


Lookout Dam Tailrace Operational and Capture Data

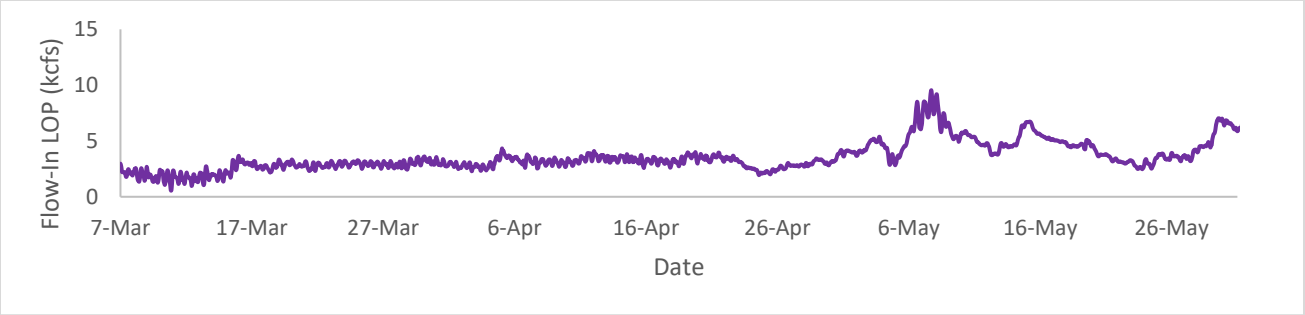


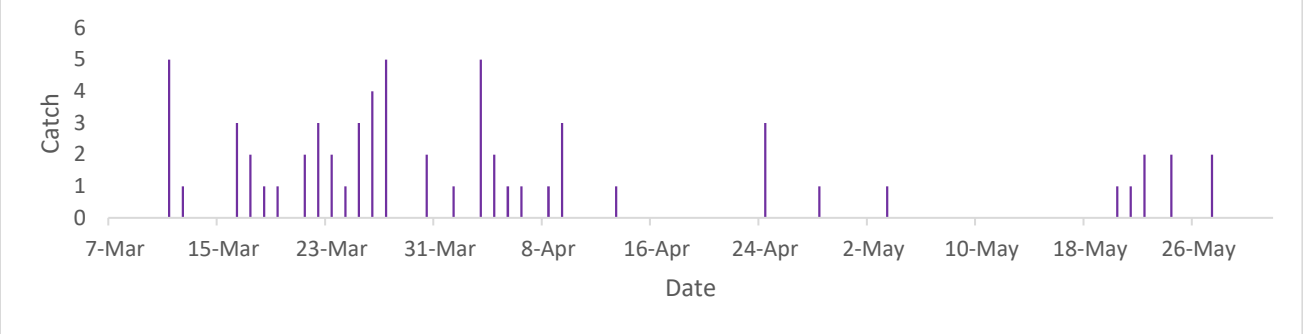




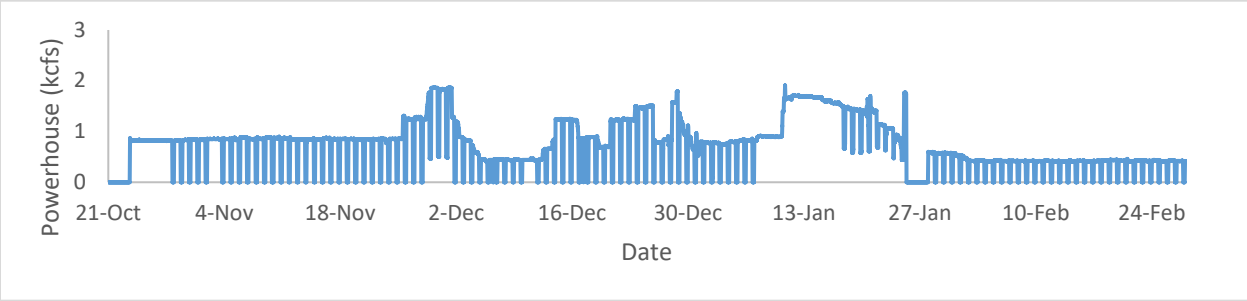


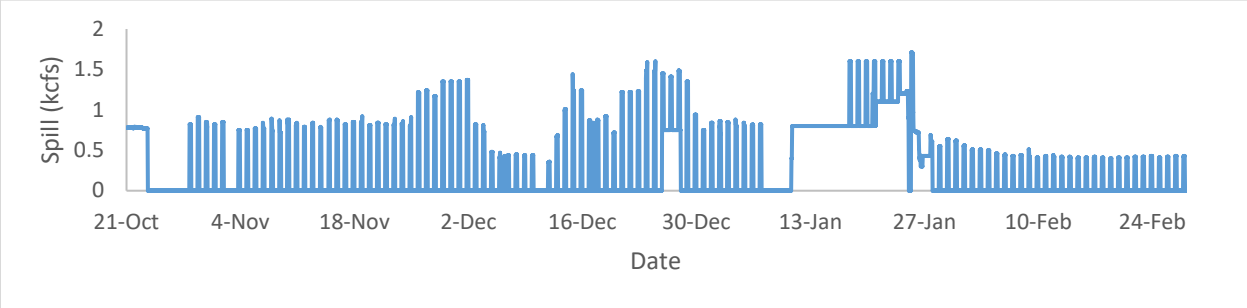
Lookout Point Head of Reservoir Operational and Capture Data Since Start of Monitoring

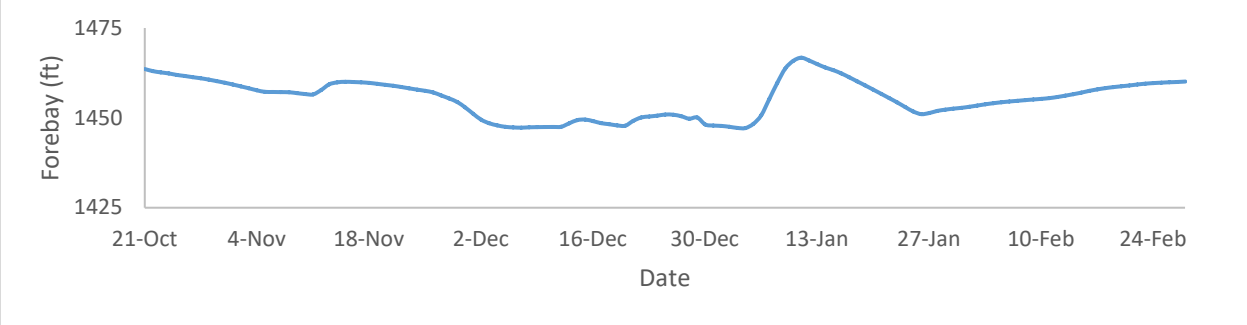


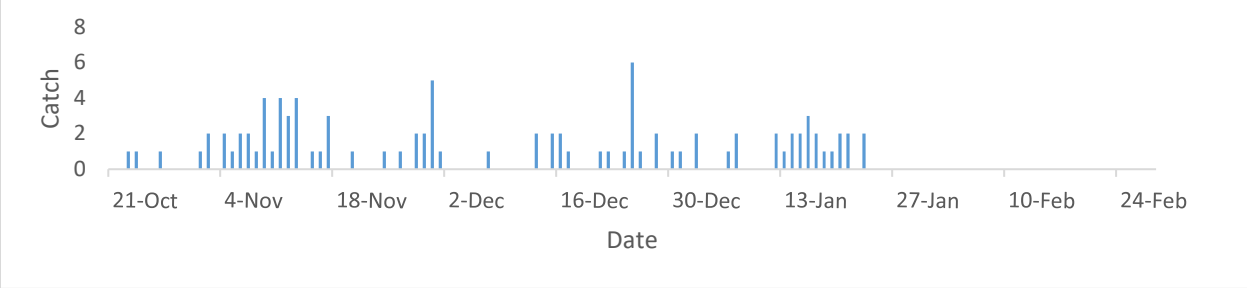


Hills Creek Dam Operational and Capture Data Since Start of Monitoring









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 Trapping Efficiency (01/19/22)

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

Dexter Dam Tailrace Trapping Efficiency (03/23/2022)

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 Trapping Efficiency (03/29/22)

Green Peter Dam Tailrace- Middle Santiam	Release #	Recapture #	Capture Efficiency
8ft Trap	643	4	0.62% (4/643)

Big Cliff Dam Trapping Efficiency (12/23/2021)

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

Cougar Dam Head of Reservoir Trapping Efficiency (03/18/2022)

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

Cougar Dam Trapping Efficiency (04/20/2022)

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

Dexter Dam Tailrace Trapping Efficiency (05/04/2022)

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 Trapping Efficiency Releases

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)

Appendix D

Summary of Project PIT Tagged Fish for Reporting Period

Site	Trap	# of PIT Tagged Fish
Big Cliff Dam	8 foot	161
Foster Dam Head of Reservoir- South Santiam	5 foot	25
Cougar Dam	PWR	4
Cougar Dam	RO	34
Green Peter Tailrace- Middle Santiam	8 foot	1
Dexter Dam Tailrace	5 foot	1
Lookout Point Head of Reservoir	5 foot	2
Lookout Dam Tailrace	Spill	1

To Date Summary of Captured Fish Containing PIT Tags

Site	Date	Trap	Species	PIT Tag #
Cougar Dam	4/7/2022	RO	Chinook	3DD.003BD59645
Cougar Dam	3/3/2022	PH	Chinook	3DD.003DA4DC74
Cougar Dam	3/4/2022	PH	Chinook	3DD.003E14CA70
Cougar Dam	3/4/2022	PH	Chinook	384.36F2B2C5D2
Cougar Dam	3/5/2022	PH	Chinook	3DD.003E14CC20
Cougar Dam	3/8/2022	PH	Chinook	3DD.003E14CD8D
Cougar Dam	3/6/2022	RO	Chinook	3DD.003E14C9D6
Cougar Dam	1/8/2022	RO	Chinook	3DD.0077780789
Cougar Dam	1/14/2022	RO	Chinook	384.36F2B2C55F

List of EAS PIT Tagged Fish for Reporting Period with site, tagging date, trap, species, and PIT Tag #

Site	Date	Trap	Species	PIT Tag #
Cougar Dam	5/20/2022	PH	Chinook	3DD.003BEE2637
Cougar Dam	5/20/2022	PH	Chinook	3DD.003BEE261B
Cougar Dam	5/20/2022	PH	Chinook	3DD.003BEE2626
Cougar Dam	5/20/2022	PH	Chinook	3DD.003BEE262D
Cougar Dam	5/21/2022	RO	Chinook	3DD.003E1BC7C1
Cougar Dam	5/21/2022	RO	Chinook	3DD.003E1BC7CE
Foster Dam Head of Reservoir- South Santiam River	5/22/2022	5 ft	O. mykiss	3DD.003BEE2628
Foster Dam Head of Reservoir- South Santiam River	5/26/2022	5 ft	O. mykiss	3DD.003BEE16AA
Foster Dam Head of Reservoir- South Santiam River	5/26/2022	5 ft	O. mykiss	3DD.003BEE1672
Foster Dam Head of Reservoir- South Santiam River	5/27/2022	5 ft	O. mykiss	3DD.003BEE25F8
Lookout Point Head of Reservoir	5/27/2022	5 ft	Chinook	3DD.003BEE2634