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Report Period: July 1 to July 15, 2022

Report No.: 2022 Willamette RST Bi-Weekly Report 07/01 to 07/15 by EAS

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

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## 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
Foster Dam Head of Reservoir-South Santiam River RST	Trap Removal	07/01/2022	07/01/2022	1
Cougar Dam RST	Operation	11/30/2021	11/30/2022	366
Cougar Dam	Trap Efficiency Release (1,200 Fish, 600 per route)	01/19/2022	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
Cougar Dam Head of Reservoir	Trap Efficiency Release (515 Fish)	06/23/2022	06/23/2022	1

Cougar Dam Head of Reservoir	Trap Removal	07/01/2022	07/01/2022	1
Dexter Dam Tailrace RST	Highline Install	03/02/2022	03/02/2022	1
Dexter Dam Tailrace RST	Trap Install	03/03/2022	03/03/2022	1
Dexter Dam Tailrace RST	Operation	03/07/2022	12/16/2022	285
Dexter Dam Tailrace RST	Trap Efficiency Release (988 Fish)	03/23/2022	03/23/2022	1
Dexter Dam Tailrace RST	Trap Efficiency Release (1000 Fish)	05/04/2022	05/04/2022	1
Dexter Dam Tailrace RST	Trap Efficiency Release (1019 Fish)	05/24/2022	05/24/2022	1
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 Dam Tailrace RST	Trap Efficiency Release (518 fish)	06/08/2022	06/08/2022	1
Fall Creek Dam Tailrace RST	Trap Efficiency Release (513 fish)	06/30/2022	06/30/2022	1
Fall Creek Dam Tailrace RST	Trap Efficiency Release (500 fish)	07/13/2022	07/13/2022	1
Fall Creek Head of Reservoir RST	Trap and Highline Install	01/11/2022	01/11/2022	1
Fall Creek Head of Reservoir RST	Operation	01/02/2022	05/31/2022	150
Fall Creek Head of Reservoir RST	Removal	06/02/2022	06/02/2022	1
Hills Creek Dam RO and PWR	Deployment	10/12/2021	10/12/2021	1
Hills Creek Dam RO	Operation	10/15/2021	03/01/2022	138
Hills Creek Dam PWR	Operation	10/15/2021	03/01/2022	138
Hills Creek Dam	Trap Efficiency Release (1,200 fish, 600 per route)	01/6/2022	01/6/2022	1
Hills Creek Dam	Trap Efficiency Release (1,200 fish, 600 per route)	02/16/2022	02/16/2022	1
Hills Creek Dam	Trap Efficiency Release (1,200 fish, 600 per route)	02/23/2022	02/23/2022	1
Hills Creek Dam RSTs	Trap Removal	03/01/2022	03/01/2022	1

## 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 six locations: Big Cliff Dam, Cougar Dam, Fall Creek Dam Tailrace, Dexter Dam Tailrace, Lookout Dam Tailrace, and Lookout Point Head of Reservoir. The Green Peter Dam Tailrace- Middle Santiam trap was removed on May 12<sup>th</sup> due to damage incurred to the highline. Traps at Cougar Dam Head of Reservoir and Foster Dam Head of Reservoir- South Santiam were removed after sampling concluded at these sites on June 30<sup>th</sup>.

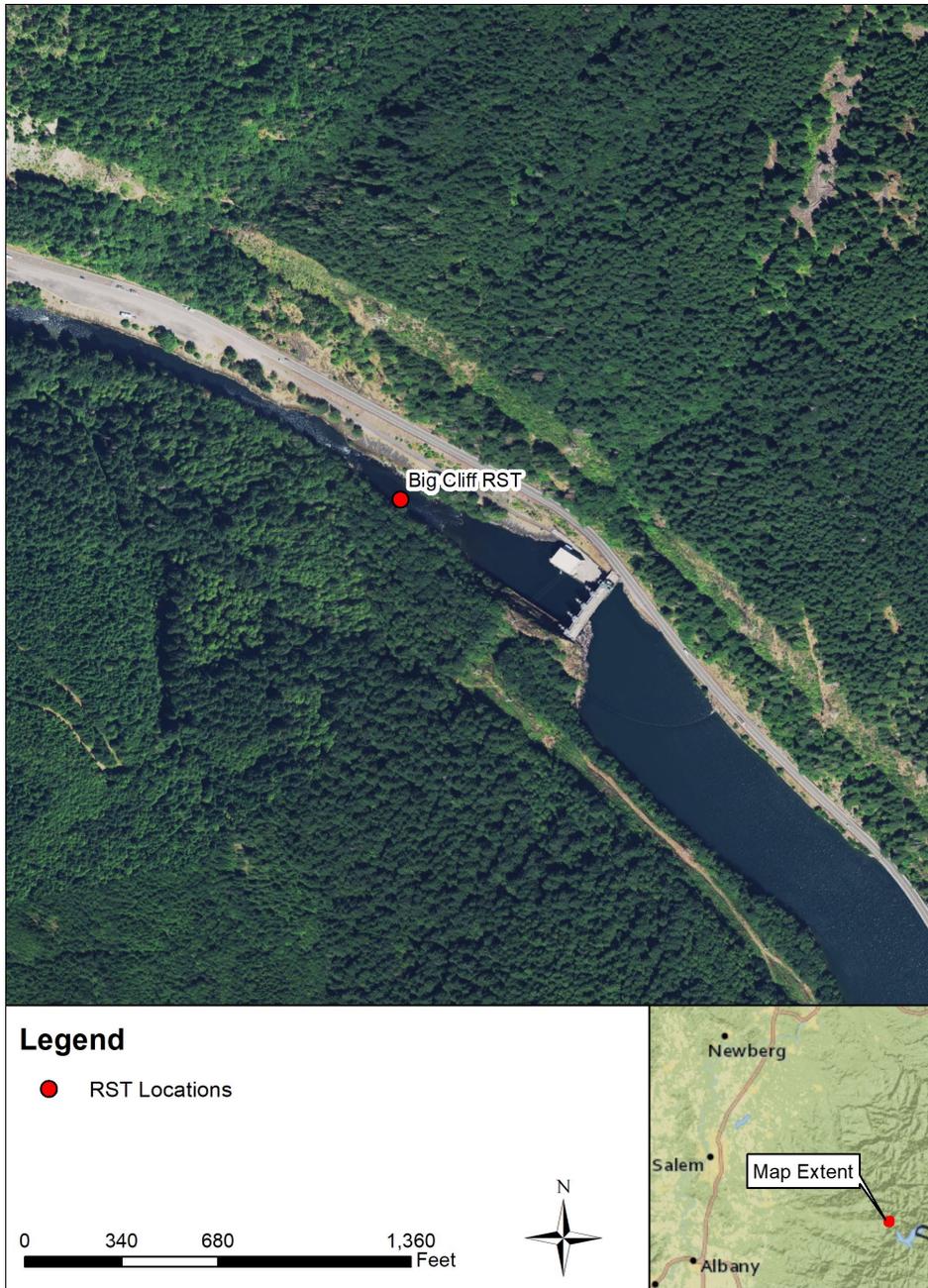
The RST's at Big Cliff Dam and Lookout Dam Tailrace started sampling on March 15<sup>th</sup>. On March 1<sup>st</sup> the Middle Fork Willamette River below Hills Creek Dam RST's were removed for the sampling season in conjunction with the end of RO spill and to prioritize the limited number of screw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

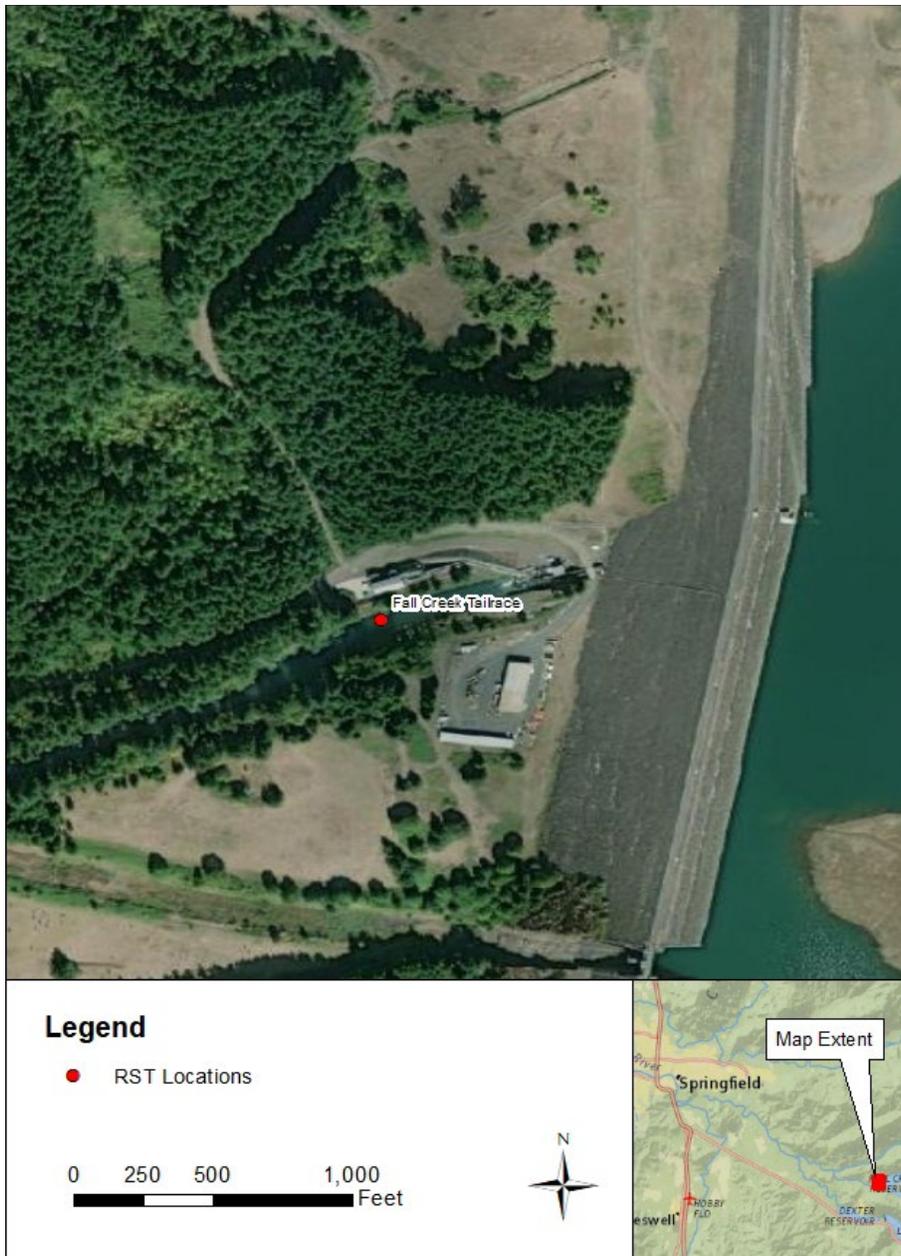
Sampling start dates are included in Table 2, and season total collection numbers are displayed in Table 3. The locations of the RST's are depicted in Figures 1 through 10.



**Figure 1. Big Cliff RST Location**



**Figure 2. Cougar Dam RST Locations**



**Figure 3. Fall Creek Dam Tailrace RST Location**



**Figure 4. Dexter Dam RST Location**



**Figure 5. Lookout Point Dam Tailrace RST Location**



**Figure 6. 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	7/1/2022	7/15/2022	15	184
Green Peter Tailrace- Middle Santiam River	3/2/2022	7/1/2022	7/15/2022	0	67
Foster Dam Head of Reservoir- South Santiam	3/16/2022	7/1/2022	7/15/2022	0	100
Cougar Dam PH	12/1/2021	7/1/2022	7/15/2022	15	227
Cougar Dam RO	12/1/2021	7/1/2022	7/15/2022	15	226
Cougar Dam Head of Reservoir	3/7/2022	7/1/2022	7/15/2022	0	100
Fall Creek Dam Tailrace*	3/15/2022	7/1/2022	7/15/2022	15	123
Dexter Dam Tailrace	3/7/2022	7/1/2022	7/15/2022	15	130
Lookout Point Dam PH	3/15/2022	7/1/2022	7/15/2022	15	117
Lookout Point Dam Spill	3/15/2022	7/1/2022	7/15/2022	15	117
Lookout Point Head of Reservoir	3/10/2022	7/1/2022	7/15/2022	15	124

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

**Table 3. Willamette Valley Rotary Screw Trap Monitoring Catch Summary**

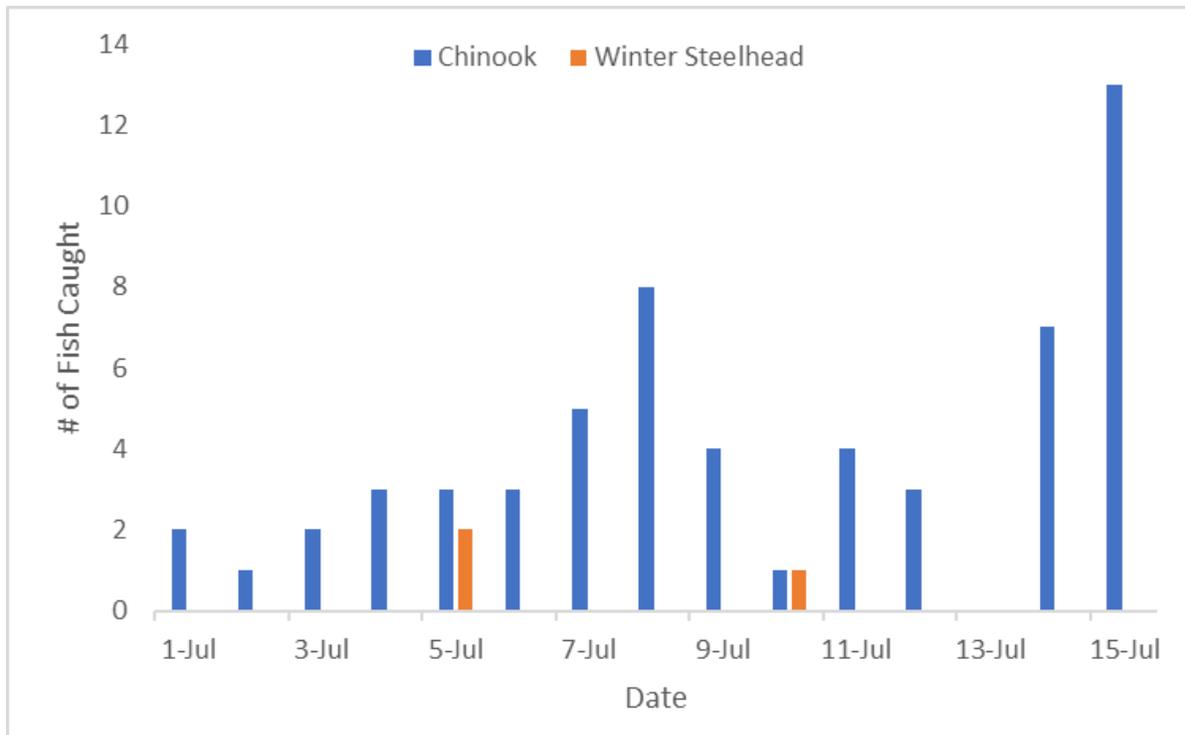
Site	Species	Catch (Reporting Period)	Recaptures (Reporting Period)	Total Catch	Total Recaptures
Big Cliff Dam	CHS	59	0	555	61
Big Cliff Dam	STW	3	0	22	0
Green Peter Tailrace- Middle Santiam	CHS	0	0	0	13
Green Peter Tailrace- Middle Santiam	STW	0	0	6	0
Foster Dam Head of Reservoir- South Santiam	CHS	0	0	66	0
Foster Dam Head of Reservoir- South Santiam	STW	0	0	90	1
Cougar Dam	CHS	12	0	1204	215
Cougar Dam Head of Reservoir	CHS	0	0	576	71
Fall Creek Dam Tailrace	CHS	0	0	0	11
Dexter Dam Tailrace	CHS	11	0	95	112
Lookout Point Dam	CHS	19	0	78	2
Lookout Point Head of Reservoir	CHS	3	0	99	197

## North Santiam – Big Cliff Dam

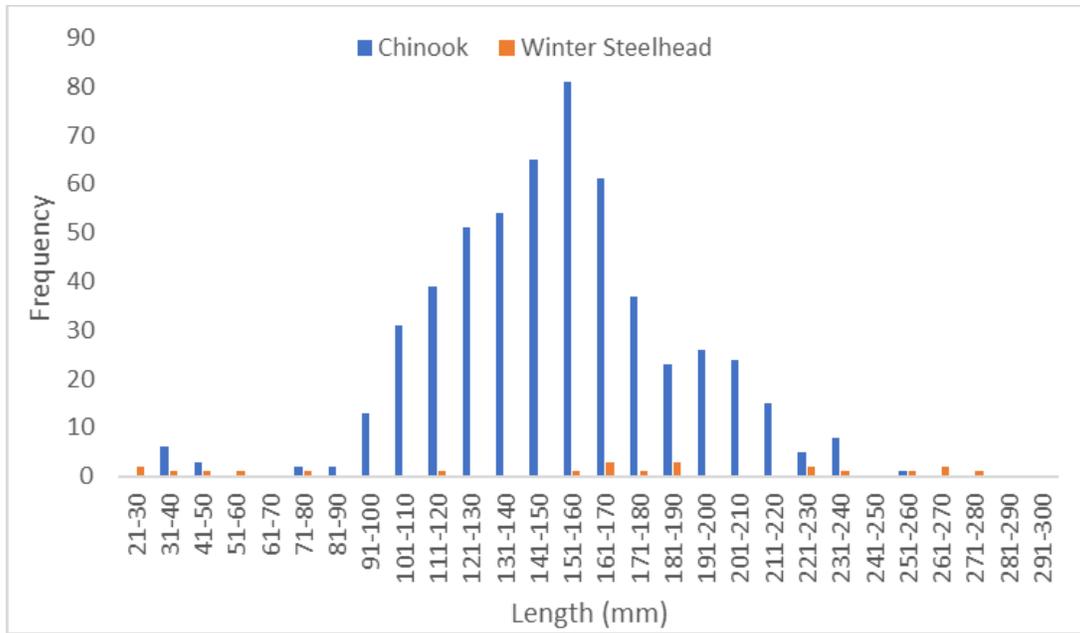
The RST on the North Santiam River below Big Cliff Dam was not sampled while fish passage measures were not being implemented from 16 February 2022 to 14 March 2022. Sampling resumed on 15 March 2022 in accordance with Task 2.2. The RST had to be temporarily removed from 6 May 2022 to 13 May 2022 due to high flows at the site that could have damaged the trap.

### Target Species

This reporting period began on July 1 and ended on July 15. There were a total of 59 Chinook salmon (CHS) and 3 Winter Steelhead (STW) captured during the 15-day sampling period (Figure 7). Sampling duration was 100% for the RST. Table 4 provides life stage, length, and weight data for all Chinook salmon and Winter Steelhead that have been caught at the Big Cliff Dam site to-date and for the reporting period. Figure 8 shows length frequency data to-date.



**Figure 7. Chinook and Winter Steelhead Captured per day 07/01/2022 to 07/15/2022 (Big Cliff)**



\*Figure does not include fish without heads (10)

**Figure 8. 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 (Since Dec. 01, 2021)										
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
		CHS	Fry	9	31	48	37.5	1.2	1.4	1.4
		CHS	Parr	21	78	130	100.3	4.8	20.1	11.6

Big Cliff	PWR	CHS	Smolt	524	91	260	155.4	8.9	180.6	41.1
		STW	Fry	5	27	52	37.0	1.2	1.9	1.6
		STW	Parr	2	75	75	93	5.2	14.3	9.8
		STW	Smolt	13	157	280	216.2	36.1	230.5	100.0

\*Fish that were missing heads are not included in length and weight calculations (10).

July 1-15, 2022										
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Big Cliff	PWR	CHS	Fry	0	N/A	N/A	N/A	N/A	N/A	N/A
		CHS	Parr	1	104	104	104.0	13.6	13.6	13.6
		CHS	Smolt	58	104	153	119.2	12.9	40.6	20.2
		STW	Fry	3	27	52	41.7	1.2	1.9	1.6
		STW	Parr	0	N/A	N/A	N/A	N/A	N/A	N/A
		STW	Smolt	0	N/A	N/A	N/A	N/A	N/A	N/A

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

## 24-Hour Post Collection Holding Trial

58 Spring Chinook and 3 Winter Steelhead were captured during the current reporting period and held for 24 hours. 4 Chinook (6.9%) and 1 Winter Steelhead (33.3%) died in holding.

## Injuries and Copepod Infection

Partial descaling <20% was observed in 38 of the 59 Chinook captured (64.4%), 6 displayed descaling >20% (10.2%), 23 displayed body injury (39.0%), 0 had eye injury (0.0%), 15 had copepods present in the branchial cavity (25.4%) and 17 had copepods on fins (28.8%). No Chinook displayed gas bubble disease (0.0%). There was 1 mortality (1.7%).

Partial descaling <20% was observed in 0 of the 3 Winter Steelhead captured (0.0%) and 0 displayed descaling >20% (0.0%), 0 displayed body injury (0.0%), 0 had eye injury (0.0%), 0 had copepods present in the branchial cavity (0%) and 0 had copepods on fins (0.0%). There were no mortalities (0.0%).

**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	59	38	6	23	0	15	17	1
Big Cliff Dam	Winter Steelhead	3	0	0	0	0	0	0	0

## Non-Target Species

9 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	6	1	54	10
Brook Lamprey	0	0	0	0
Bullhead	0	0	3	0
Crappie	0	0	0	0
Longnose Dace	0	0	0	0
Kokanee	0	0	120	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
Chinook (clipped)	0	0	8	0
<i>O. mykiss</i> (clipped)	1	0	4	2
Pumpkinseed	2	0	69	5
Unknown	0	0	1	0
<b>Totals</b>	<b>9</b>	<b>1</b>	<b>260</b>	<b>56</b>

## 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 1,109.1 feet to 1,110.3 feet (mean: 1,109.5 feet). Figure 9 shows instantaneous gage height.

Total dissolved gas saturation ranged from 104 to 112% during the reporting period (mean: 107.7%). Figure 10 shows total dissolved gas saturation.

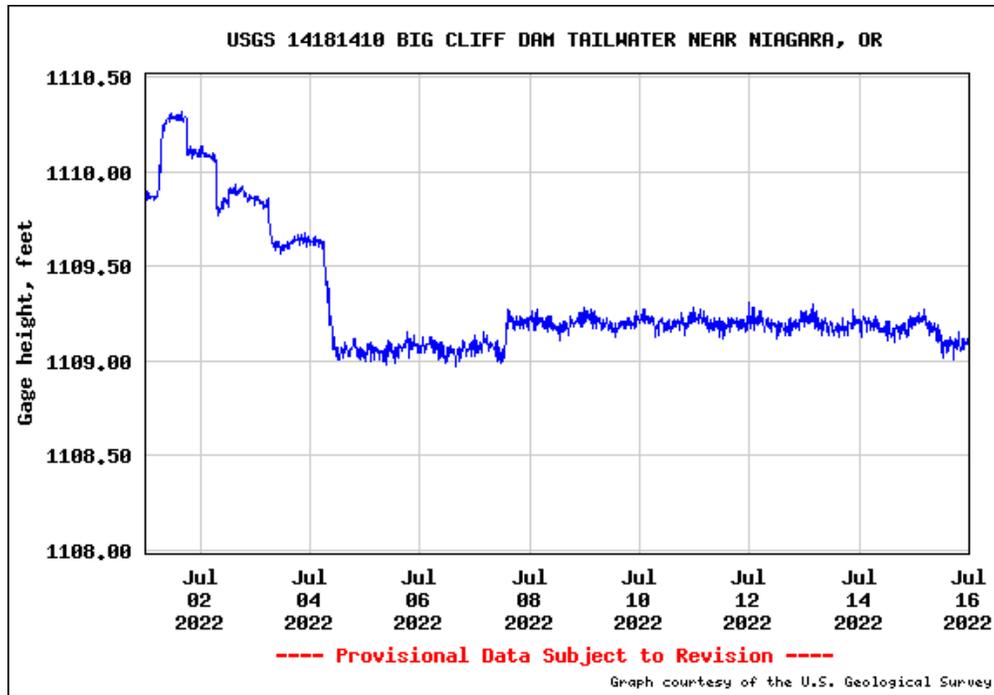
Stream temperatures were recorded every 2 hours for the length of the report period at the RST (Figure 11). Temperature probes operated normally throughout this reporting period.

Flows through the Powerhouse and Spill during the reporting period averaged 1,451 and 0 cubic feet per second (cfs), respectively (Figure 12). Catch per unit of effort (CPUE) data are summarized in Table 7.

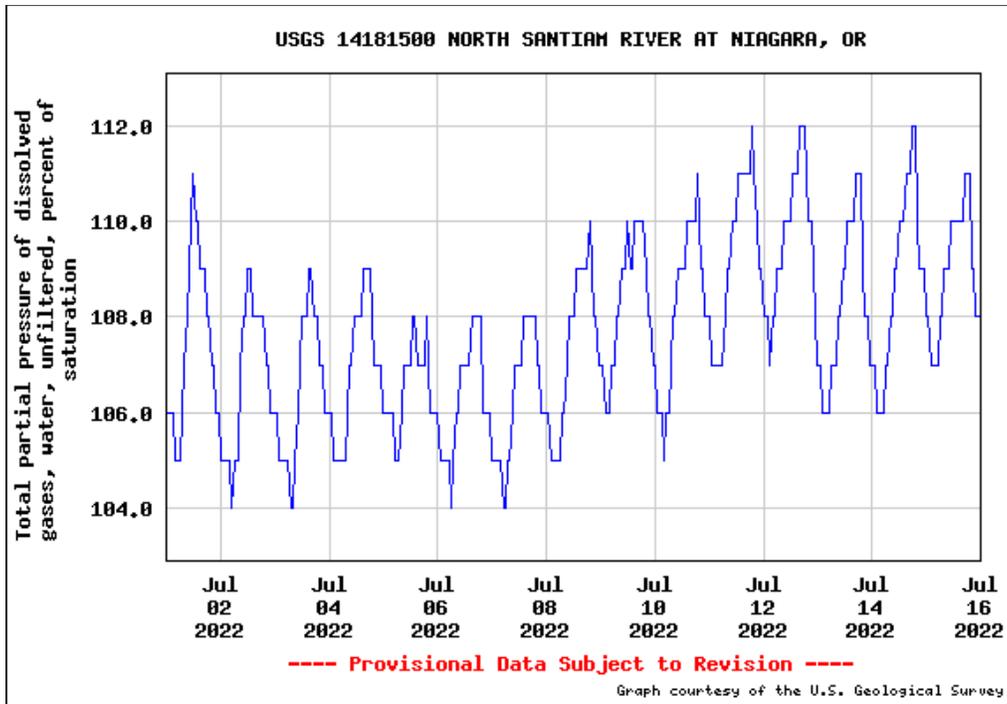
Discharge and capture data for the duration of monitoring efforts at this location are provided in Appendix B.

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

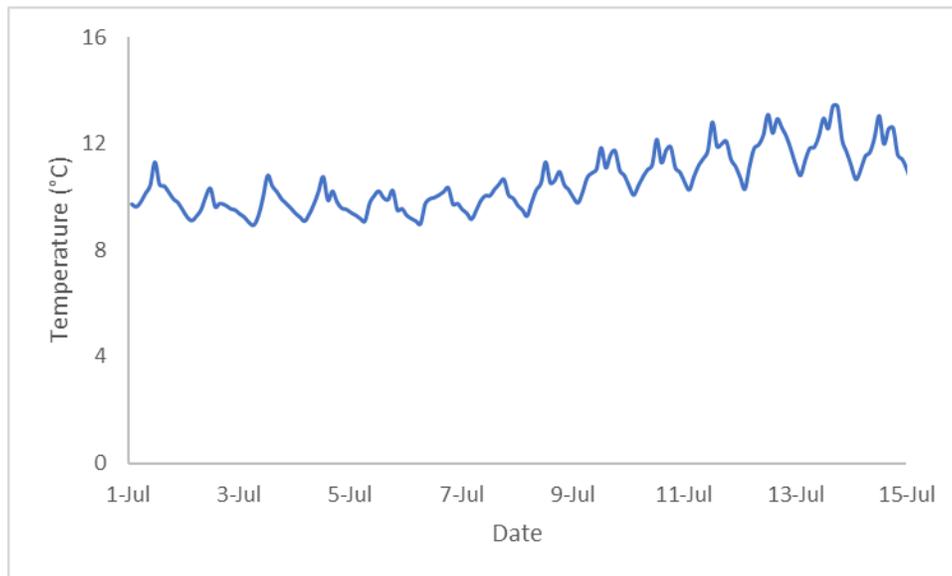
	Chinook	Winter Steelhead
Description	(8 ft)	(8 ft)
Catch	59	3
Effort (hrs)	358.9	358.9
CPUE (fish/hr)	0.164	0.008



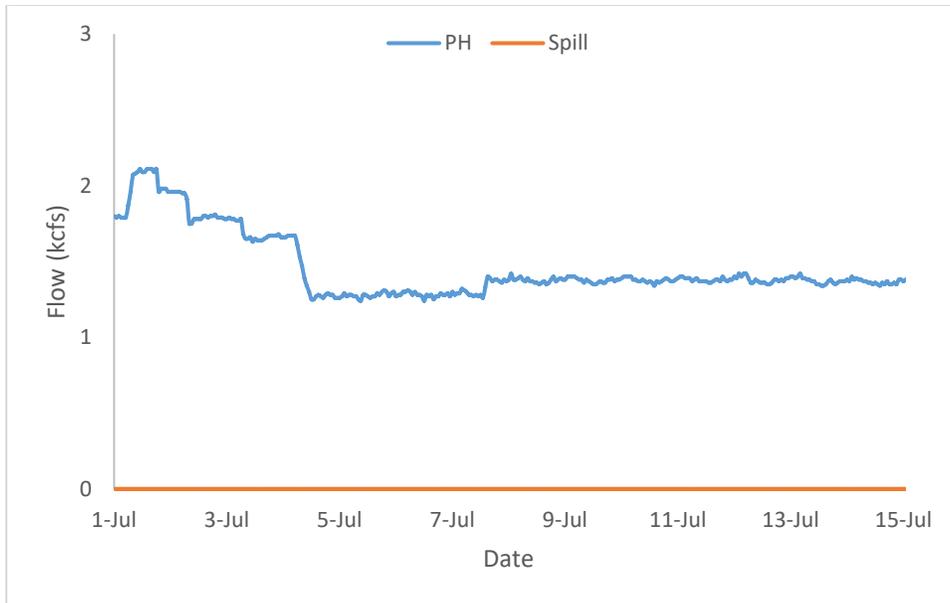
**Figure 9. Gage height (ft); below Big Cliff Dam**



**Figure 10. Total Dissolved Gas Saturation (%); below Big Cliff Dam**



**Figure 11. Temperature at RST (Big Cliff Dam)**

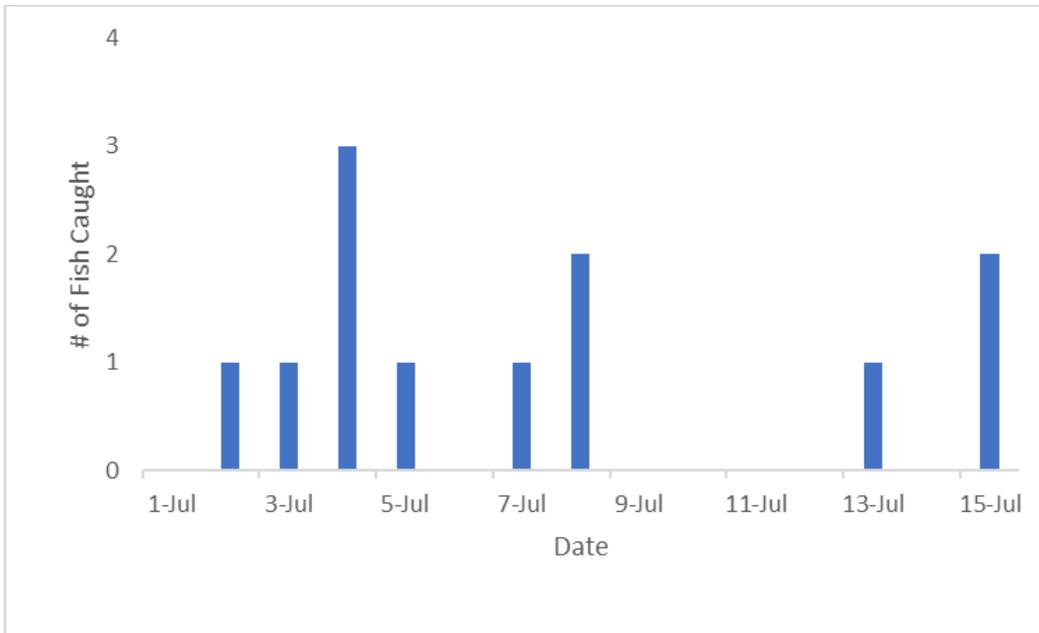


**Figure 12. Hourly Flows PWR vs. RO (Big Cliff Dam)**

## South Fork McKenzie – Cougar Dam

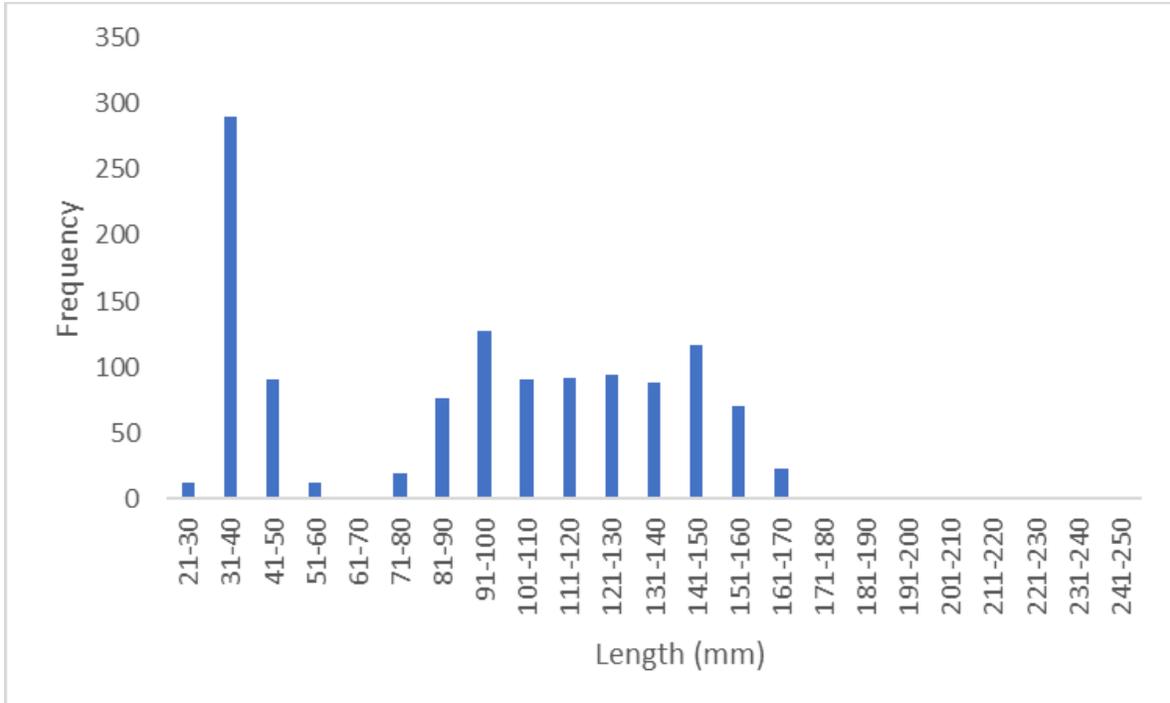
### Target Species

This reporting period began on July 1 and ended on July 15. There was a total of 12 Chinook Salmon (CHS) captured during the 15-day sampling period (Figure 13). 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 14 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 13. Chinook Captured Per Day 07/01/2022 to 07/15/2022 (Cougar Dam)**



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

**Figure 14. 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	6.34% (63/993)

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

To-Date (Since Dec. 01, 2021)										
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Cougar Dam	RO	CHS	Fry	21	34	48	40.8	N/A	N/A	N/A
		CHS	Parr	135	56	164	108.5	1.2	41.1	14.8
		CHS	Smolt	225	92	230	139.2	8.8	86.1	29.1
Cougar Dam	PWR	CHS	Fry	381	25	55	38.0	1.0	1.8	1.2
		CHS	Parr	242	54	165	99.5	1.6	41.0	10.8
		CHS	Smolt	209	76	167	131.2	4.2	45.6	23.9

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

July 1-15, 2022										
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Cougar Dam	RO	CHS	Fry	0	N/A	N/A	N/A	N/A	N/A	N/A
		CHS	Parr	0	N/A	N/A	N/A	N/A	N/A	N/A
		CHS	Smolt	0	N/A	N/A	N/A	N/A	N/A	N/A
Cougar Dam	PWR	CHS	Fry	0	N/A	N/A	N/A	N/A	N/A	N/A
		CHS	Parr	4	72	79	76.5	2.0	5.8	4.4
		CHS	Smolt	8	91	119	103.1	7.8	20.6	13.7

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

### 24-Hour Post Collection Holding Trial

A total of 10 Chinook captured in the RSTs, 10 fish from the PWR RST and 0 from the RO RST, were held for ~24 hours in holding tanks and then evaluated for survival rates. In total, 1 of the fish (10.0%) held during this period died during holding. 1 of the 10 PWR RST captured fish (10.0%) died during holding and 0 of the 0 RO RST captured fish (0.0%) died during holding.

### Injuries and Copepod Infection

No fish were captured in the RO RST, therefore, no injuries are associated with the trap during the reporting period.

Partial descaling <20% was observed on 6 of the 12 Chinook collected at the PWR RST (50.0%). Descaling >20% was observed on 3 of the Chinook (25.0%). There were 5 PWR RST fish with bodily injuries (41.7%) and 0 had eye injuries (0.0%). 3 fish from the PWR RST had copepods present in the

branchial cavity (25.0%) and 2 had copepods present on fins (16.7%). No fish displayed Gas Bubble Disease (0.0%). There were 0 chinook mortalities collected in the RO RST (0.0%) and 1 in the PWR RST (16.7%). 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	0	0	0	0	0	0	0	0
Cougar	PWR	12	6	3	5	0	3	2	2

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

### Non-Target Species

A total of 1160 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	2	0	3	0
Bullhead	0	0	0	0	0	0
Crappie	0	0	0	0	0	0
Dace	0	0	992	1	1915	3
Kokanee	0	0	0	0	0	0
Red-Sided Shiner	0	0	0	0	0	0
Sculpin	0	0	71	0	138	1
Spotted Bass	0	0	0	0	0	0
Smallmouth Bass	0	0	0	0	2	0
Largescale Sucker	0	0	0	0	1	0
Mountain Whitefish	0	0	21	0	38	0
Cutthroat	0	0	15	0	45	1
<i>O. mykiss</i>	0	0	59	0	192	2
Bull Trout	0	0	0	0	1	0
Unknown	0	0	0	0	20	1
<b>Totals</b>	<b>0</b>	<b>0</b>	<b>1160</b>	<b>1</b>	<b>2276</b>	<b>8</b>

### 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 1,252.7 feet to 1,252.9 feet (mean: 1,252.8 feet). Figure 15 shows instantaneous gage height.

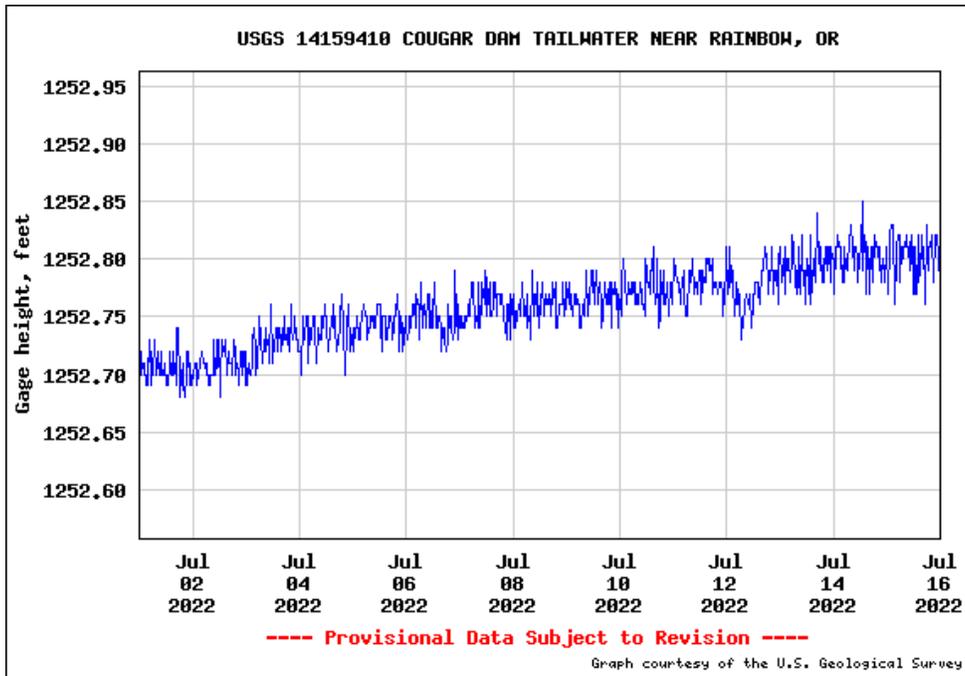
Total dissolved gas saturation ranged from 102 to 107% (mean: 104.3%). Figure 16 shows total dissolved gas saturation.

Stream temperatures were recorded every 2 hours for the length of the report period for the RO and PWR RST's (Figure 17 and 18 respectively). Temperature probes for the RO and PWR RST operated normally throughout this reporting period.

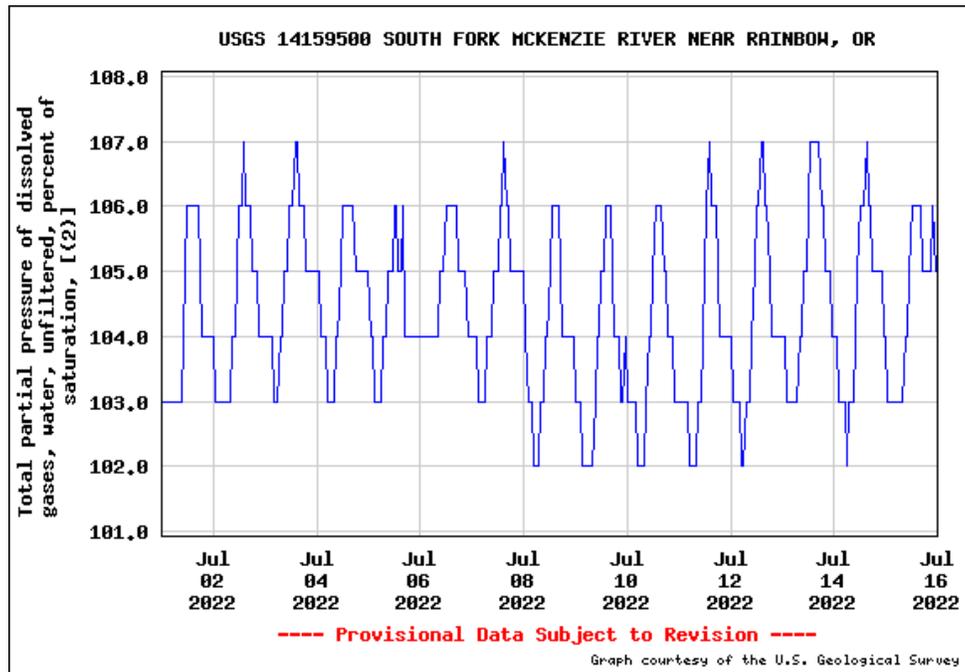
Flows through the Powerhouse and RO during the reporting period averaged 305.5 and 0 cubic feet per second (cfs) respectively (Figure 19). Catch per unit of effort (CPUE) data are summarized in Table 19. Discharge and capture data for the duration of monitoring efforts at this location are provided in Appendix B.

**Table 19. Summary of salmonid CPUE, Cougar Dam.**

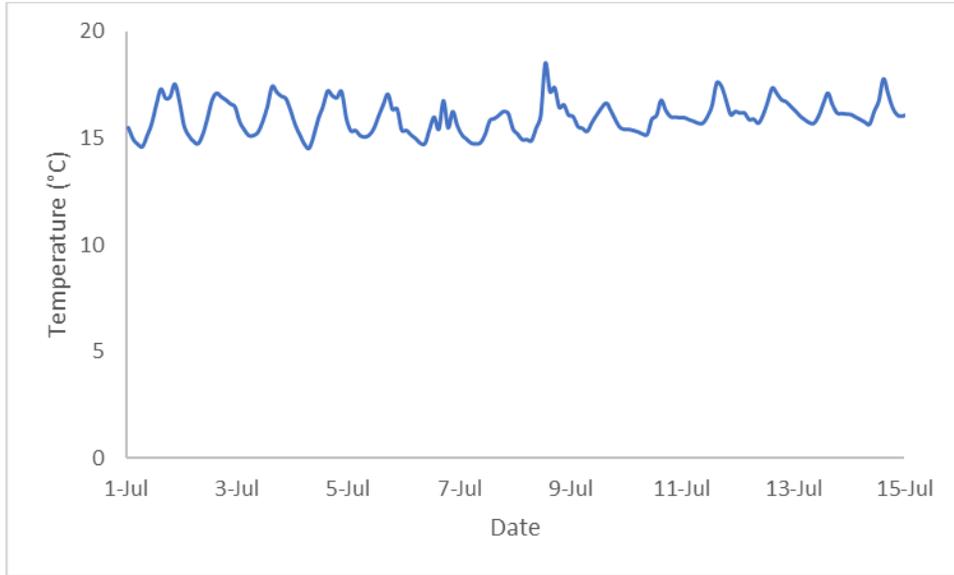
	Chinook	
Description	RO (5ft)	PWR(8ft)
Catch	0	12
Effort (hrs)	358.1	717.6
CPUE (fish/hr)	0	0.017



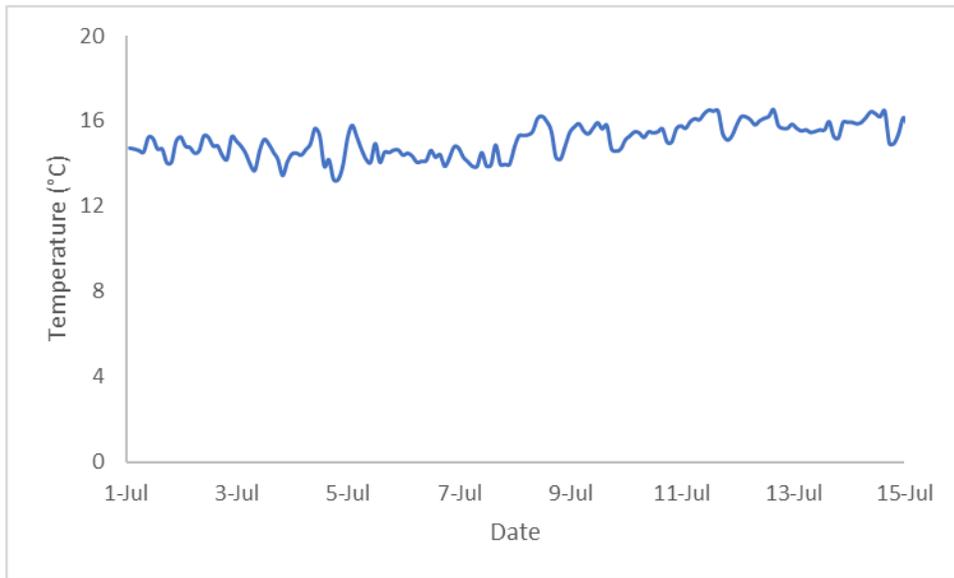
**Figure 15. Gage Height (feet); below Cougar Dam, South Fork McKenzie River**



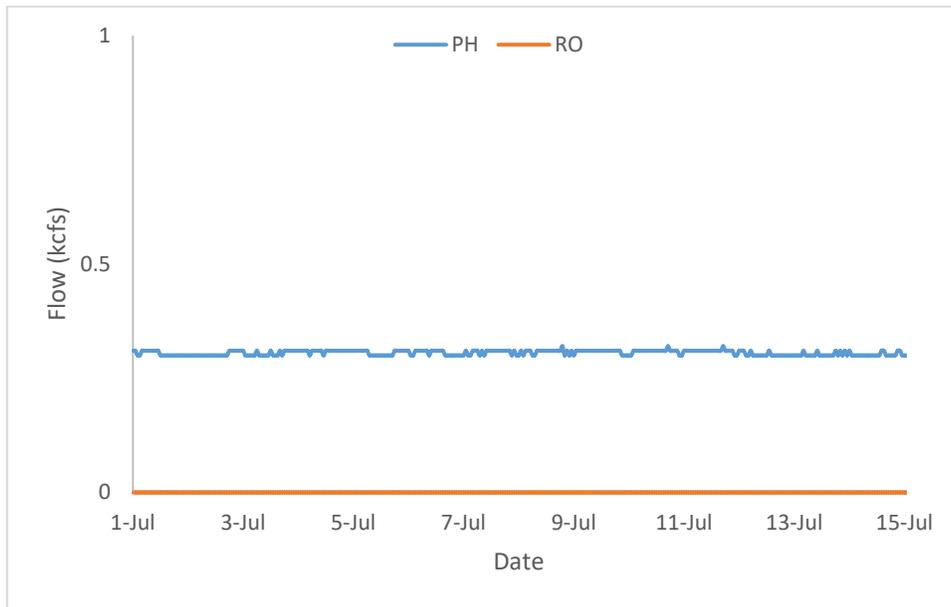
**Figure 16. Total Dissolved Gas Saturation (%); below Cougar Dam, South Fork McKenzie River**



**Figure 17. Temperature at RO RST (Cougar Dam)**



**Figure 18. Temperature at PWR RST (Cougar Dam)**



**Figure 19. Hourly Flows PWR vs. RO (Cougar Dam)**

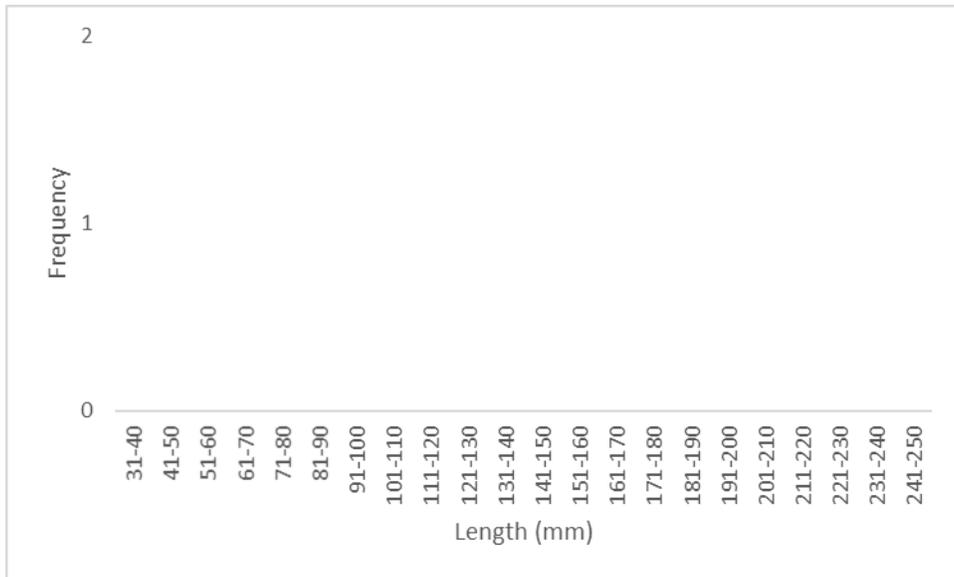
## **Middle Fork Willamette – Fall Creek Dam Tailrace**

### **Target Species**

The reporting period began July 1 and ended July 15. No Chinook salmon were captured during the 15-day sampling period (Figure 20). 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 21 shows length frequency data to-date.



**Figure 20. Chinook Captured Per Day 07/01/2022 to 07/15/2022 (Fall Creek Dam Tailrace)**



**Figure 21. 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	N/A	N/A	N/A	N/A	N/A	N/A
		CHS	Parr	0	N/A	N/A	N/A	N/A	N/A	N/A

July 1-15,2022										
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Fall Creek Dam	RO	CHS	Smolt	0	N/A	N/A	N/A	N/A	N/A	N/A
		CHS	Parr	0	N/A	N/A	N/A	N/A	N/A	N/A

### 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

A total of 500 juvenile hatchery Chinook (sub yearlings) were adipose clipped, Bismarck Brown dyed, and released on 07/13/2022 upstream of the Fall Creek Dam Tailrace RO channel trap site. A total of 0 fish were recaptured in the 8 ft trap. Trapping efficiency was 0%.

Fall Creek Dam	Release #	Recapture #	Capture Efficiency

RO	500	0	0% (0/500)
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### Non-Target Species

No 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	5	0
Bullhead	0	0	1	0
Bull Trout	0	0	0	0
Crappie	0	0	0	0
Cutthroat Trout	0	0	4	0
Dace	0	0	97	0
Red-Sided Shiner	0	0	4	0
Sculpin	0	0	4	0
Spotted Bass	0	0	0	0
Sucker	0	0	4	0
Whitefish	0	0	0	0
<i>O. mykiss</i>	0	0	5	1
<b>Totals</b>	<b>0</b>	<b>0</b>	<b>124</b>	<b>1</b>

### 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 231.0 cfs to 235.0 cfs (mean: 231.8 cfs). Figure 22 shows instantaneous discharge.

Dissolved oxygen concentrations ranged from 9.8 to 11.2 mg/L (mean: 10.4 mg/L) during the reporting period. Figure 23 shows dissolved oxygen concentrations.

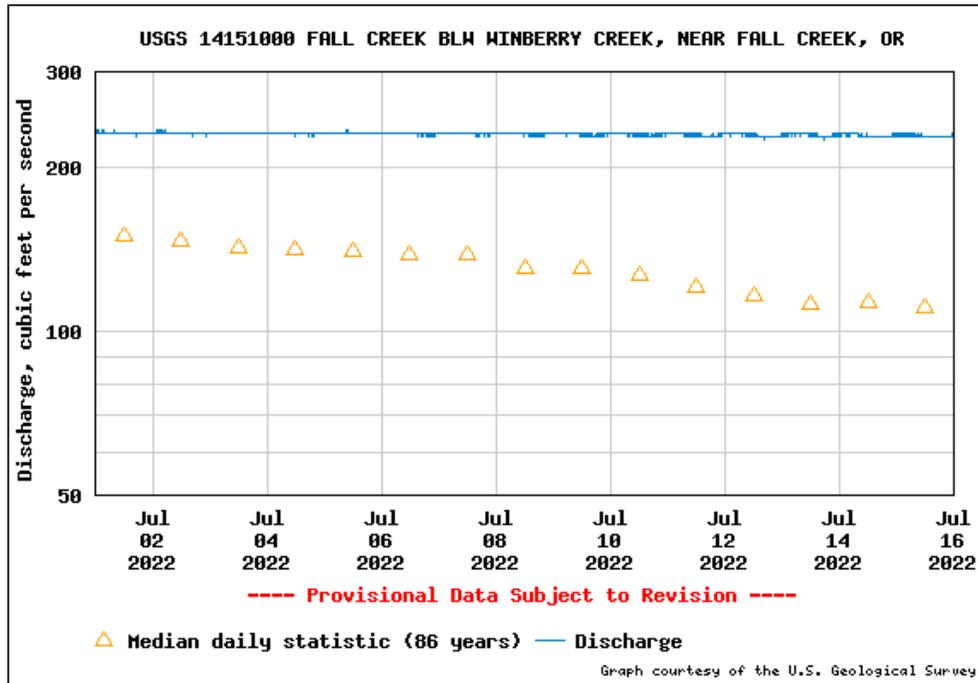
Stream temperatures were recorded using temperature probes for the Fall Creek Dam Tailrace RST site during this reporting period. Logger was ripped off the trap prior to this reporting period and a new one was installed on July 7<sup>th</sup>, 2022. The temperature probe operated normally during this period (Figure 24).

Flows In and Out of reservoir during the reporting period averaged 141.8 cfs and 230.3 cfs respectively (Figure 25).

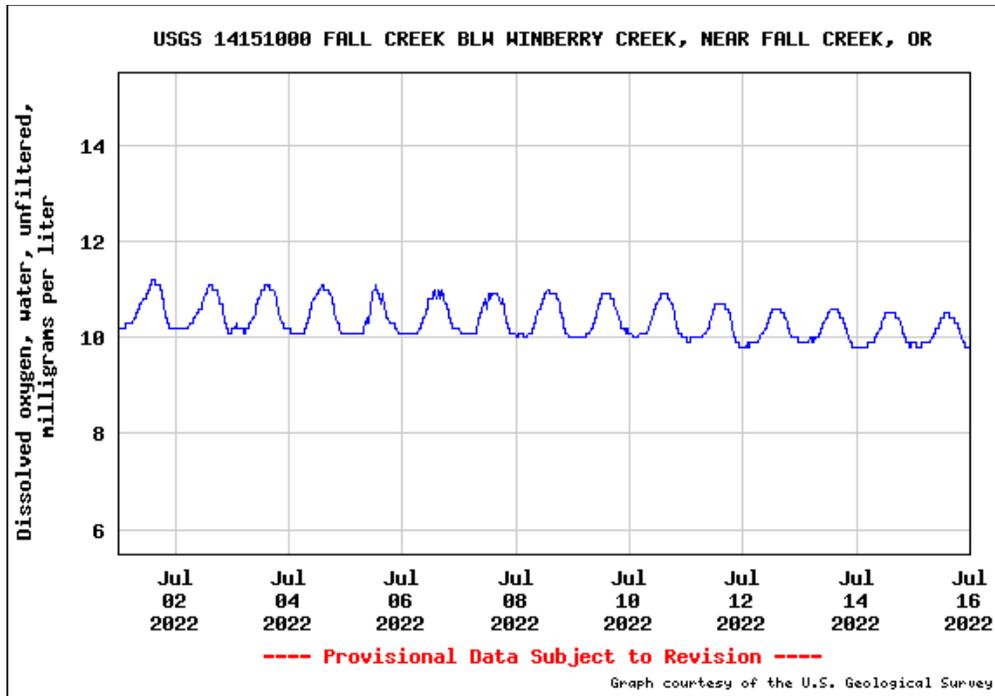
Catch per unit of effort (CPUE) data are summarized in Table 27. Discharge and capture data for the duration of monitoring efforts at this location are provided in Appendix B

**Table 27. Summary of Chinook CPUE, Fall Creek Dam Tailrace**

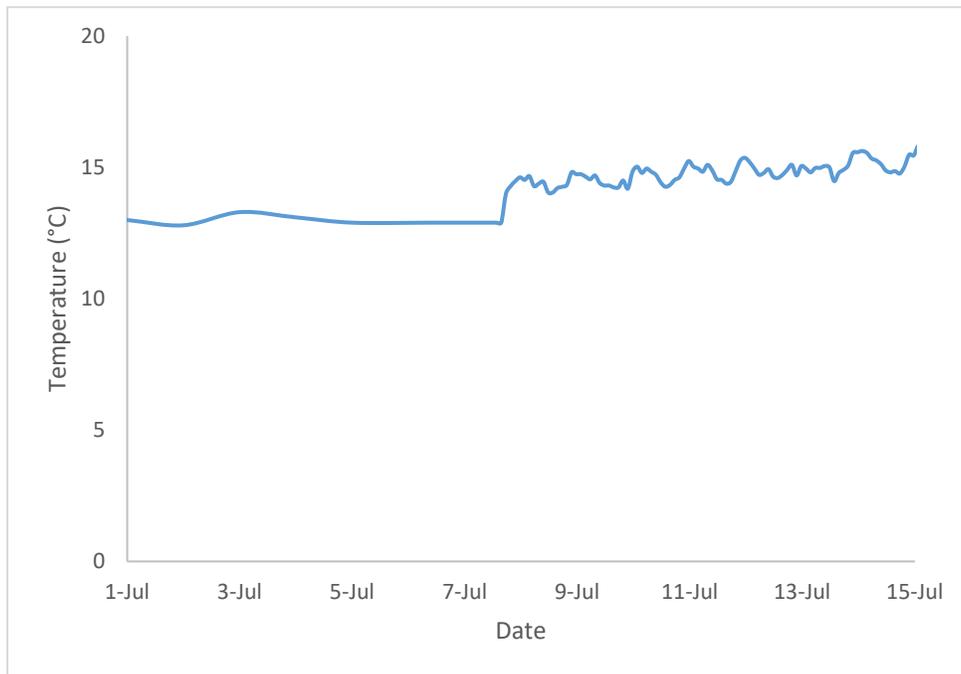
	Chinook
Description	(8 ft)
Catch	0
Effort (hrs)	360.7
CPUE (fish/hr)	0



**Figure 22. Discharge (cfs); Fall Creek Below Winberry Creek, Near Fall Creek, OR**

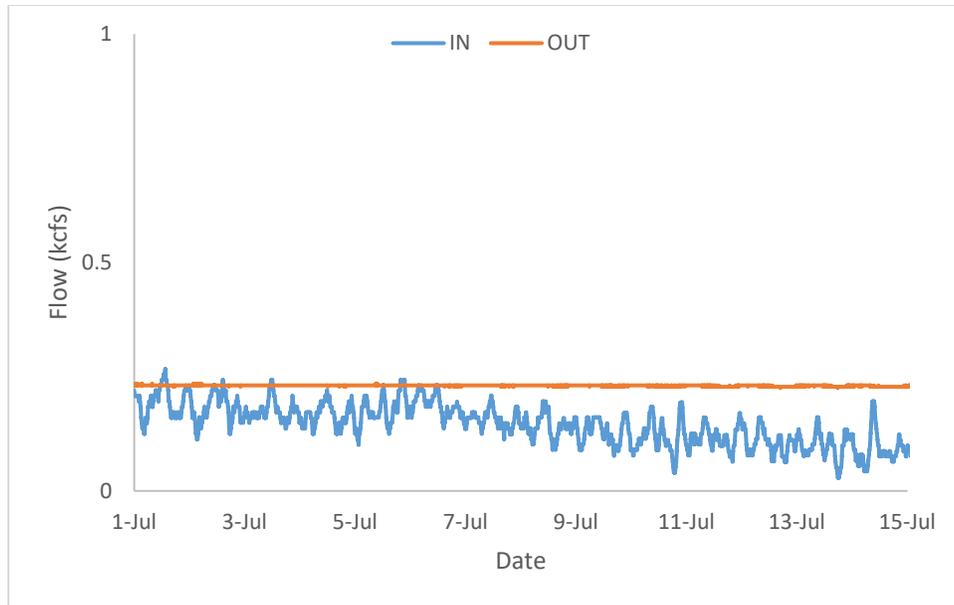


**Figure 23. Dissolved Oxygen (mg/L); Fall Creek below Winberry Creek, Near Fall Creek, OR**



Note: Hobo logger was ripped off trap prior to the reporting period. Temperature began recording with a new logger on July 7th, 2022. Data supplemented with daily trap check temperatures from July 1<sup>st</sup>, 2022 to time of logger deployment.

**Figure 24. Temperature at RST (Fall Creek Dam Tailrace)**

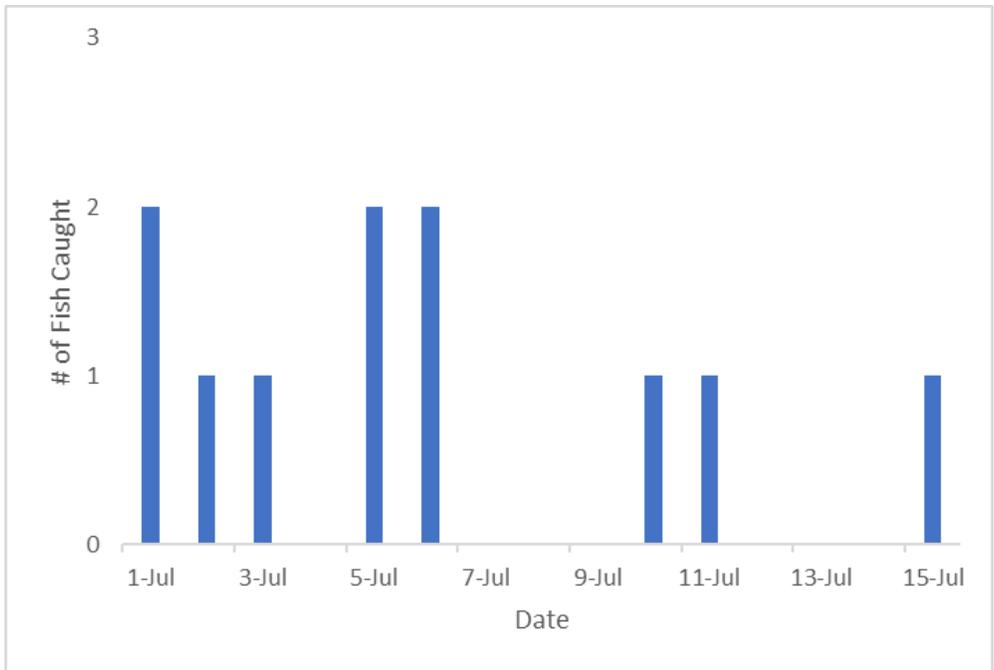


**Figure 25. Hourly Flows PWR vs. RO (Fall Creek Tailrace)**

## **Middle Fork Willamette– Dexter Dam**

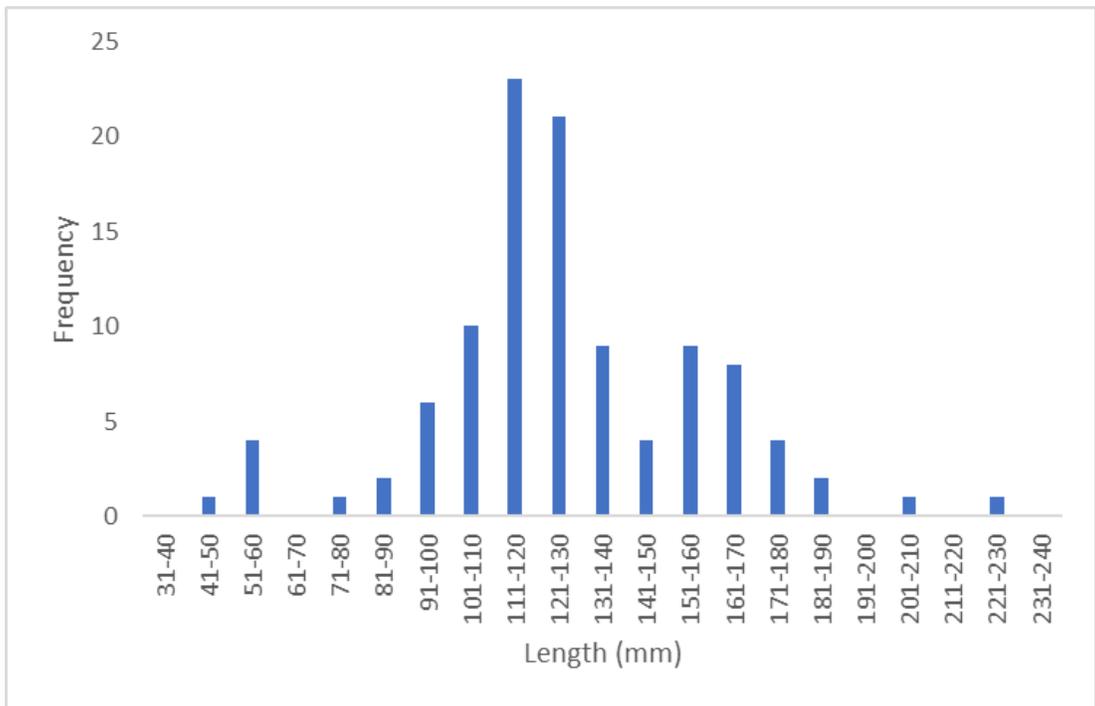
### **Target Species**

This reporting period began on July 1 and ended on July 15. There were 11 Chinook salmon (CHS) captured during the 15-day sampling period (Figure 26). 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 26 shows the daily capture numbers for Chinook and Figure 27 shows length frequency data to-date.



\*Recaptured fish for trapping efficiency trials not included.

**Figure 26. Chinook Captured Per Day 07/01/2022 to 07/15/2022 (Dexter Dam)**



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

## Figure 27. 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 (Since March 07, 2022)										
Site	Trap	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Dexter Dam	5 ft	CHS	Fry	4	46	55	52.3	1.4	1.4	1.4
		CHS	Parr	17	51	159	102.5	2.1	48.3	13.4
		CHS	Smolt	85	95	224	135.8	9.3	118.4	26.8

July 1-15, 2022										
Site	Trap	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Dexter Dam 5 ft		CHS	Fry	1	55	55	55.0	1.4	1.4	1.4
		CHS	Parr	1	84	84	84.0	8.2	8.2	8.2
		CHS	Smolt	9	110	135	122.6	15.8	26.0	19.7

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

### Trapping Efficiency

A total of 1,019 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% (67/1,019)
Powerhouse	N/A	N/A	N/A

### 24-Hour Post Collection Holding Trial

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

## Injuries and Copepod Infection

11 Chinook were captured during this reporting period. Partial descaling <20% was observed in 8 of the 11 Chinook captured (72.7%) and 1 displayed descaling >20% (9.1%). 4 displayed body injury (36.4%) and 0 Chinook had eye injury (0.0%). 0 Chinook had copepods present in the branchial cavity (0.0%) and 0 had copepods on fins (0.0%). 0 displayed gas bubble disease (0.0%). There were 0 mortalities this reporting period (0.0%). Injuries are displayed in Table 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	11	8	1	4	0	0	0	0

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

## Non-Target Species

105 non-target species fish were captured during the reporting period; the data is summarized below in Table 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	1	1	2	1
Lamprey	0	0	0	0
Bullhead	0	0	0	0
Crappie	1	1	12	5
Dace	0	0	31	6
Red-Sided Shiner	0	0	1	0
Sculpin	4	0	191	13
Spotted Bass	0	0	0	0
Sucker	0	0	2	0
Whitefish	0	0	0	0
Cutthroat	1	0	3	0
<i>O. mykiss</i>	0	0	11	0
<i>O. mykiss</i> (clipped)	0	0	30	1
Chinook (clipped)	98	0	351	7
<b>Totals</b>	<b>105</b>	<b>2</b>	<b>525</b>	<b>31</b>

## 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 638.3 feet to 639.9 feet (mean: 638.9 feet). Figure 28 shows instantaneous gage height.

Total dissolved gas saturation ranged from 105 to 117% (mean: 109.6%) during the reporting period. Figure 29 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 30.

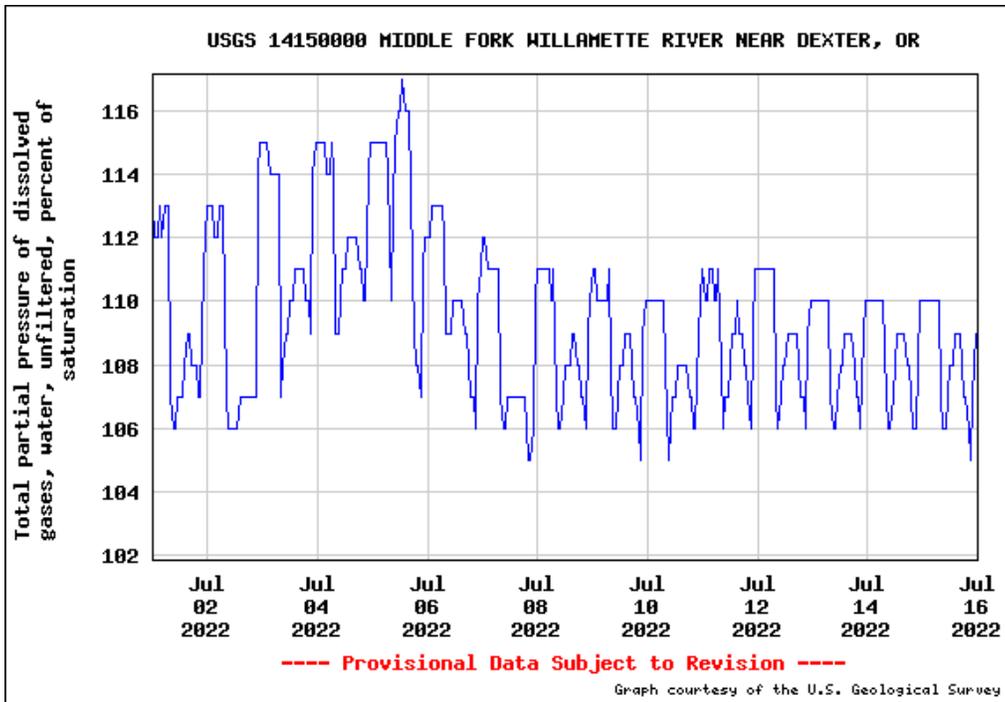
Flows through the Powerhouse and Spill during the reporting period averaged 2,019.1 and 1,706.7 cubic feet per second (cfs) respectively (Figure 31). Catch per unit of effort (CPUE) data are summarized in Table 35. Discharge and capture data for the duration of monitoring efforts at this location are provided in Appendix B.

**Table 35. Summary of salmonid CPUE, Dexter Dam.**

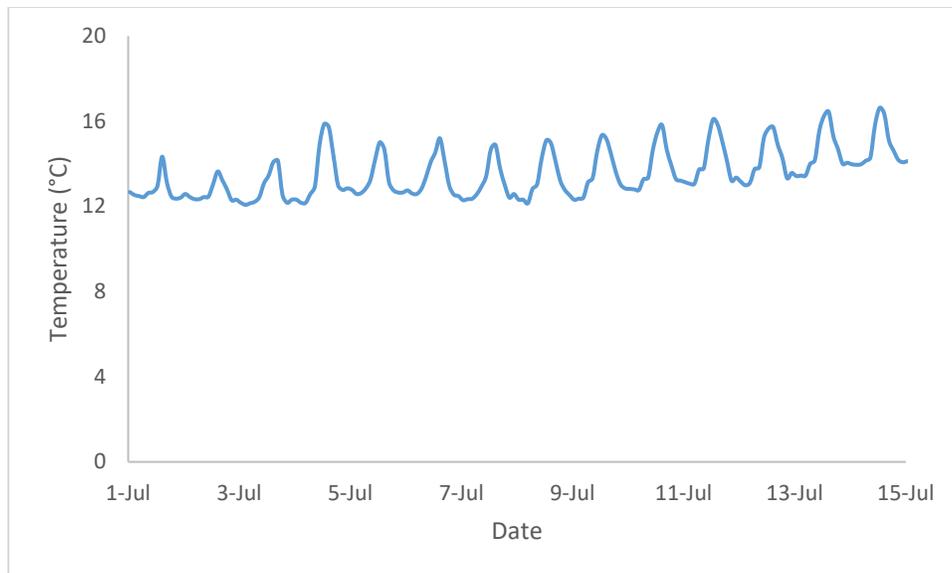
	<b>Chinook</b>
<b>Description</b>	<b>8 ft</b>
Catch	11
Effort (hrs)	356.5
CPUE (fish/hr)	0.031



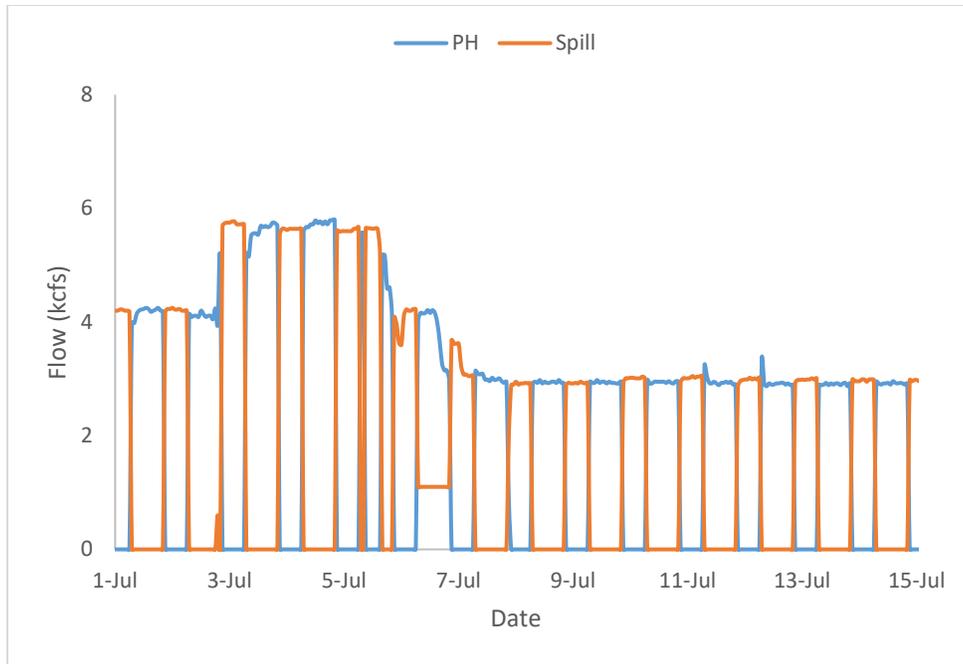
**Figure 28. Gage Height (feet); below Dexter Dam, Middle Fork Willamette**



**Figure 29. Total Dissolved Gas Saturation (%); Middle Fork Willamette River, Near Dexter, OR**



**Figure 30. Temperature at RST (Dexter Dam)**

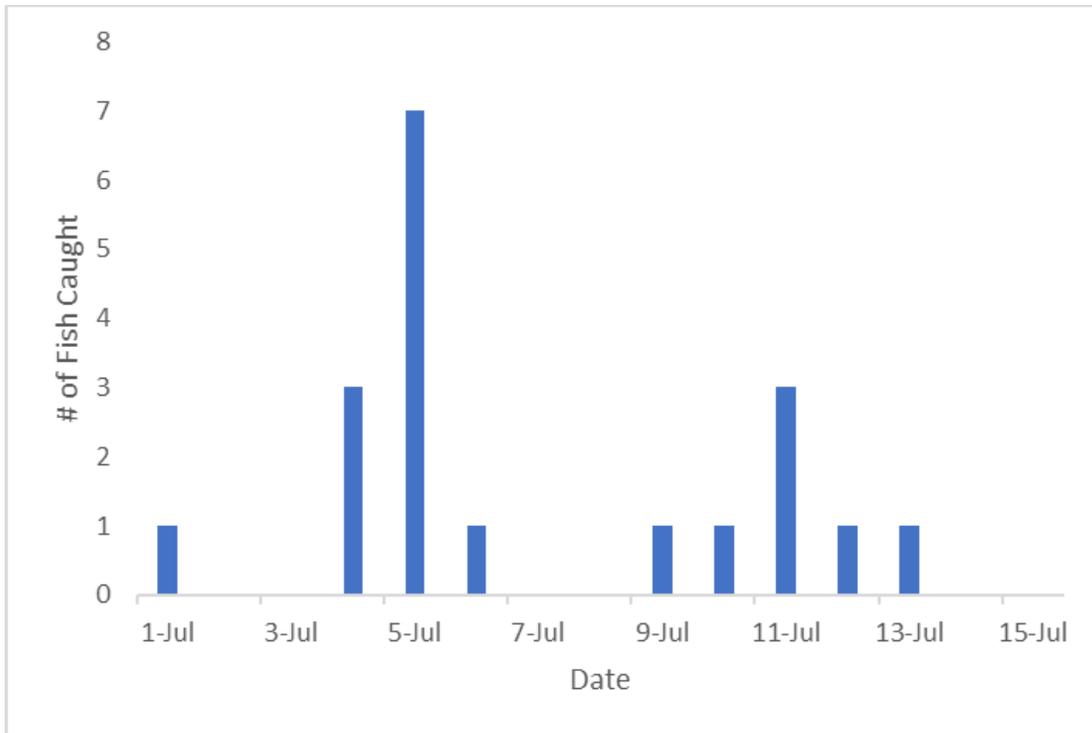


**Figure 31. Hourly Flows PWR vs. Spill (Dexter Dam)**

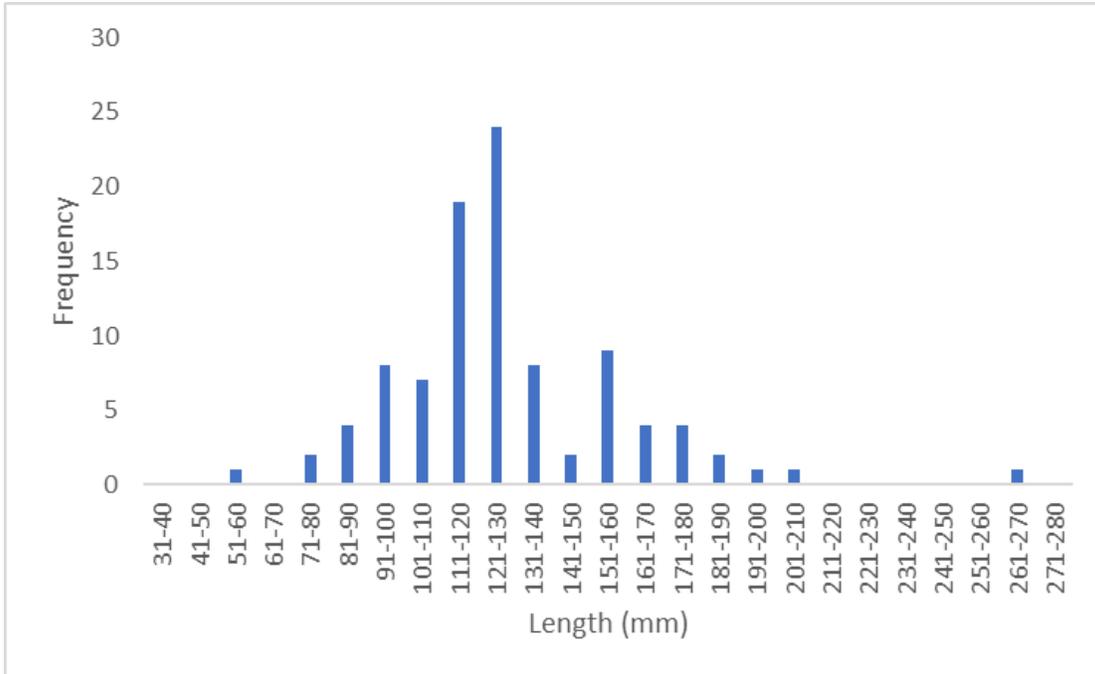
## **Middle Fork Willamette – Lookout Dam Tailrace**

### **Target Species**

The reporting period began July 1 and ended July 15. 19 Chinook salmon were captured during the 15-day sampling period (Figure 32). 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 33 shows length frequency data to-date.



**Figure 32. Chinook Captured Per Day 07/01/2022 to 07/15/2022 (Lookout Point Dam Tailrace)**



**Figure 33. 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 (Since March 15, 2022)										
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Lookout Point Dam	PH 1	CHS	Smolt	31	112	266	144.8	15.0	108.9	36.4
		CHS	Parr	3	84	107	94.3	3.8	10.5	6.5
		CHS	Fry	0	0	0	0	0	0	0
	PH 2	CHS	Smolt	12	95	141	118.1	8.4	32.3	18.6
		CHS	Parr	5	58	108	85.8	2.2	13.4	5.6
		CHS	Fry	0	0	0	0	0	0	0
	Spill	CHS	Smolt	40	94	194	130.7	7.6	63.0	25.6
		CHS	Parr	6	77	126	96.5	5.4	26.1	12.1
		CHS	Fry	0	0	0	0	0	0	0

July 1-15, 2022										
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Lookout Point Dam	PH 1	CHS	Smolt	6	112	135	122.0	15.0	25.2	20.3
		CHS	Parr	0	N/A	N/A	N/A	N/A	N/A	N/A
		CHS	Fry	0	N/A	N/A	N/A	N/A	N/A	N/A
	PH 2	CHS	Smolt	4	95	129	115	8.4	23.5	16.0
		CHS	Parr	1	85	85	85	1.4	1.4	1.4
		CHS	Fry	0	N/A	N/A	N/A	N/A	N/A	N/A
	Spill	CHS	Smolt	8	100	133	118.3	13.0	25.4	19.8
		CHS	Parr	0	N/A	N/A	N/A	N/A	N/A	N/A
		CHS	Fry	0	N/A	N/A	N/A	N/A	N/A	N/A

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

## 24-Hour Post Collection Holding Trial

A total of 17 Chinook captured in the RSTs was held during this reporting period. 10 fish were held from the PWR RST and 7 fish were held from the Spill RST. 4 hold fish died from the PWR RSTs (2 from PH 1 and 2 from PH 2) (40.0%). 3 of the fish from Spill RST died during holding (42.9%).

## 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 8 Chinook captured in the Spill Channel RST. Partial descaling <20% was observed on 7 of 8 Chinook collected at the Spill RST (87.5%), and descaling >20% was observed on 0 of the Chinook collected (0.0%). 7 displayed body injuries (87.5%) and 0 had eye injuries (0.0%). None of the Spill RST Chinook had copepods present in the branchial cavity (0.0%) and 1 had copepods present on fins (12.5%). 1 of the fish captured in the Spill RST displayed Gas Bubble Disease (level 2) (12.5%).

There were 11 Chinook captured in the Powerhouse channel RSTs. Partial descaling <20% was observed on 6 of the 11 Chinook collected at the PWR RSTs (54.5%). Descaling >20% was observed on 3 of the Chinook collected (27.3%). 9 PWR RST fish had bodily injury (81.8%) and 3 had eye injuries (27.3%). 2 of the fish had copepods present in the branchial cavity (18.2%) and 0 had copepods present on fins (0.0%). 1 fish displayed Gas Bubble Disease (level 1) (9.1%). There was 1 chinook mortality collected in the Spill RST (12.5%) and 1 in the PWR RST (9.1%). 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	11	6	3	9	3	2	0	1
	Spill	8	7	0	7	0	0	1	1

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

## Non-Target Species

405 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	3	1
Crappie	0	0	0	0	4	1
Cutthroat	0	0	0	0	1	0
Northern Pike minnow	6	3	5	3	15	8
Red-Sided Shiner	0	0	0	0	1	0
Sculpin	3	0	0	0	18	2
Largemouth Bass	204	159	180	108	385	268
Smallmouth Bass	2	0	1	0	55	13
Largescale Sucker	1	2	1	0	25	15
Walleye	0	0	2	0	6	3
<i>O. mykiss</i>	0	0	0	0	6	1
<i>O. mykiss</i> (clipped)	0	0	0	0	1	1
Chinook (clipped)	0	0	0	0	4	0
<b>Totals</b>	<b>216</b>	<b>164</b>	<b>189</b>	<b>111</b>	<b>525</b>	<b>313</b>

## Stream Statistics

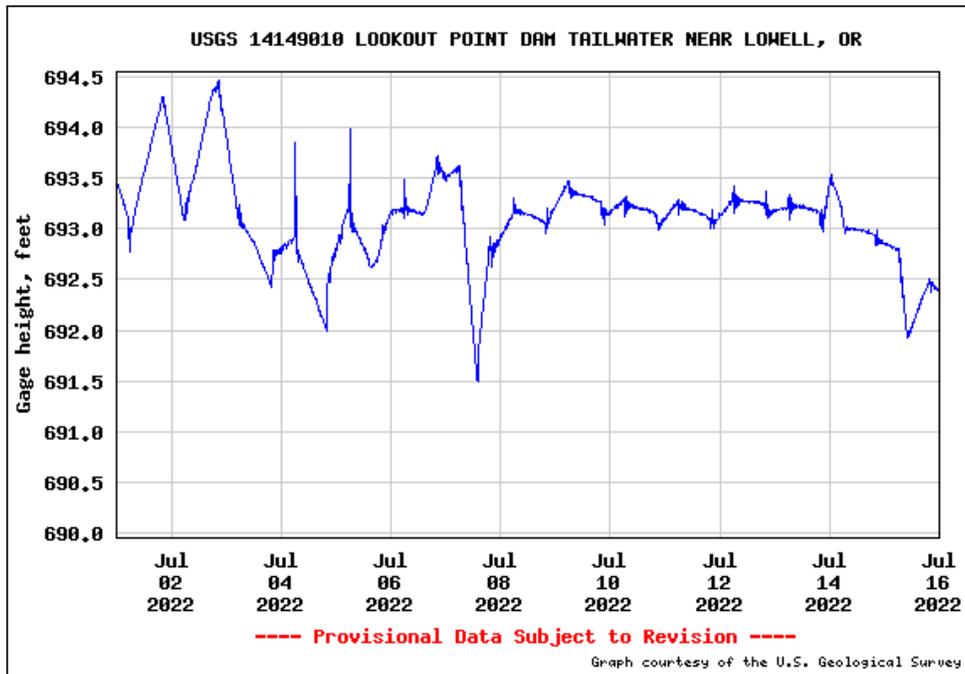
Basic stream statistics at Lookout Dam Tailrace site were calculated from data downloaded from the U.S. Geological Survey stream gage number 14149010. Total dissolved gas saturation or dissolved oxygen concentration measurements are not available at this stream gage site, or any nearby stream gages. Gage height (feet) is the only metric provided at this gage. During the reporting period, daily maximum values for instantaneous gage height ranged from 692.9 feet to 694.5 feet (mean: 693.6 feet). Figure 34 shows instantaneous gage height.

Stream temperatures were recorded every two hours using a temperature probe at the Lookout Dam RST site during this reporting period. Temperature probes operated normally, and the data is shown below in (figures 35 and 36).

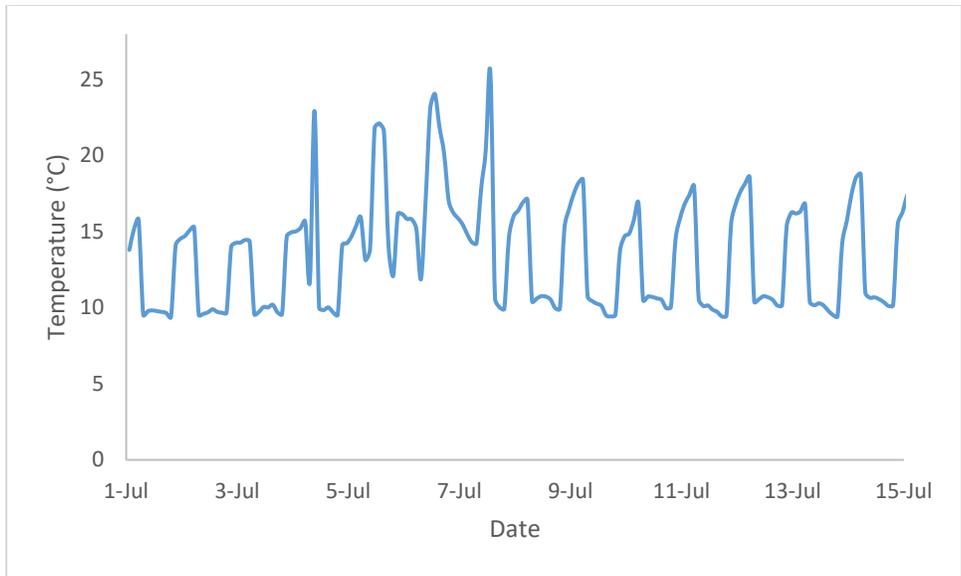
Flows through the Powerhouse and Spill during the reporting period averaged 2,164.9 and 1,563.7 cubic feet per second (cfs) respectively (Figure 37). Catch per unit of effort (CPUE) data are summarized in Table 39. Discharge and capture data for the duration of monitoring efforts at this location are provided in Appendix B.

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

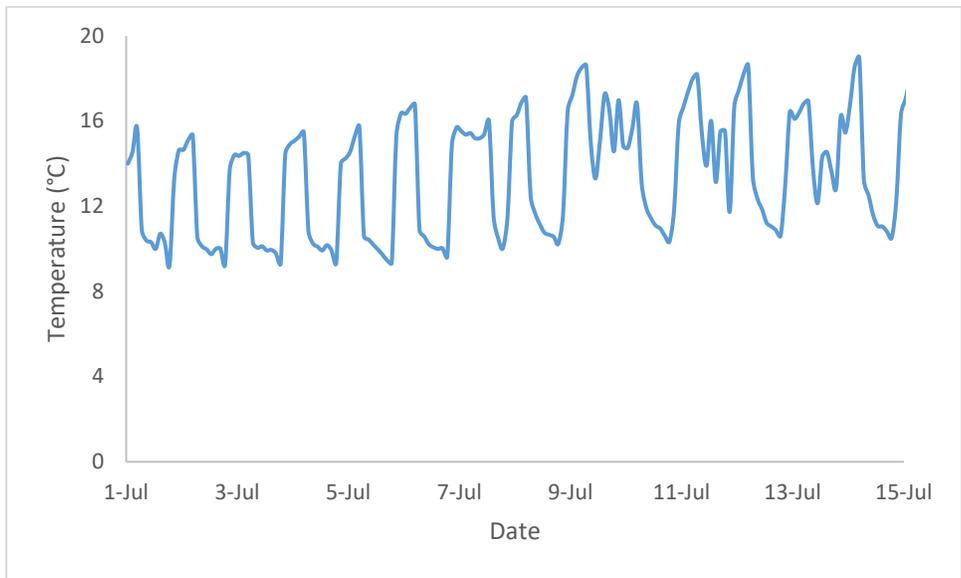
Description	Chinook		
	PH 1	PH 2	Spill
Catch	6	5	8
Effort (hrs)	358.7	358.7	355.6
CPUE (fish/hr)	0.017	0.014	0.022



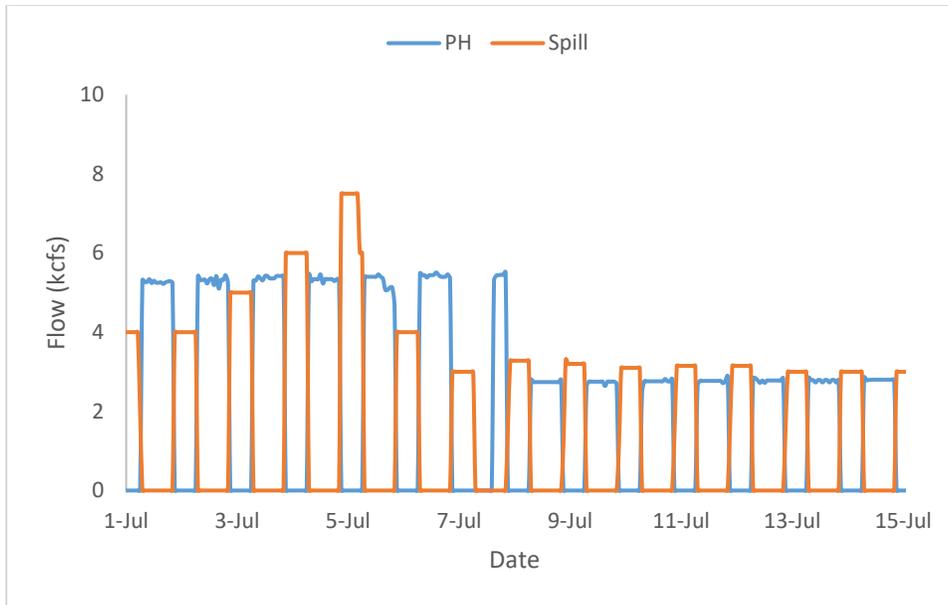
**Figure 34. Gage Height (feet); below Lookout Dam**



**Figure 35. Temperature at RST (Lookout Dam PWR)**



**Figure 36. Temperature at RST (Lookout Dam Spill)**

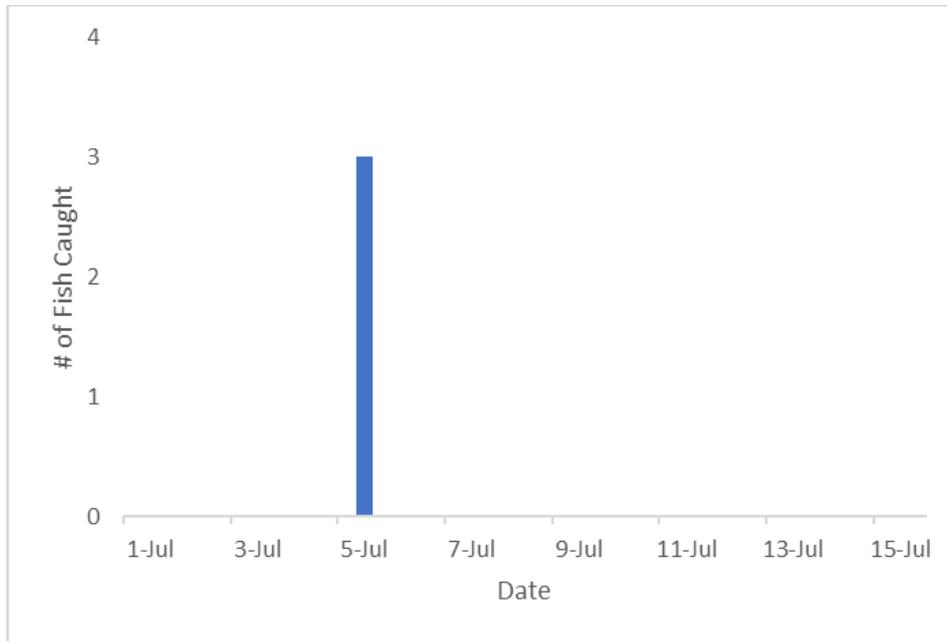


**Figure 37. Hourly Flows PWR vs. Spill (Lookout Dam Tailrace)**

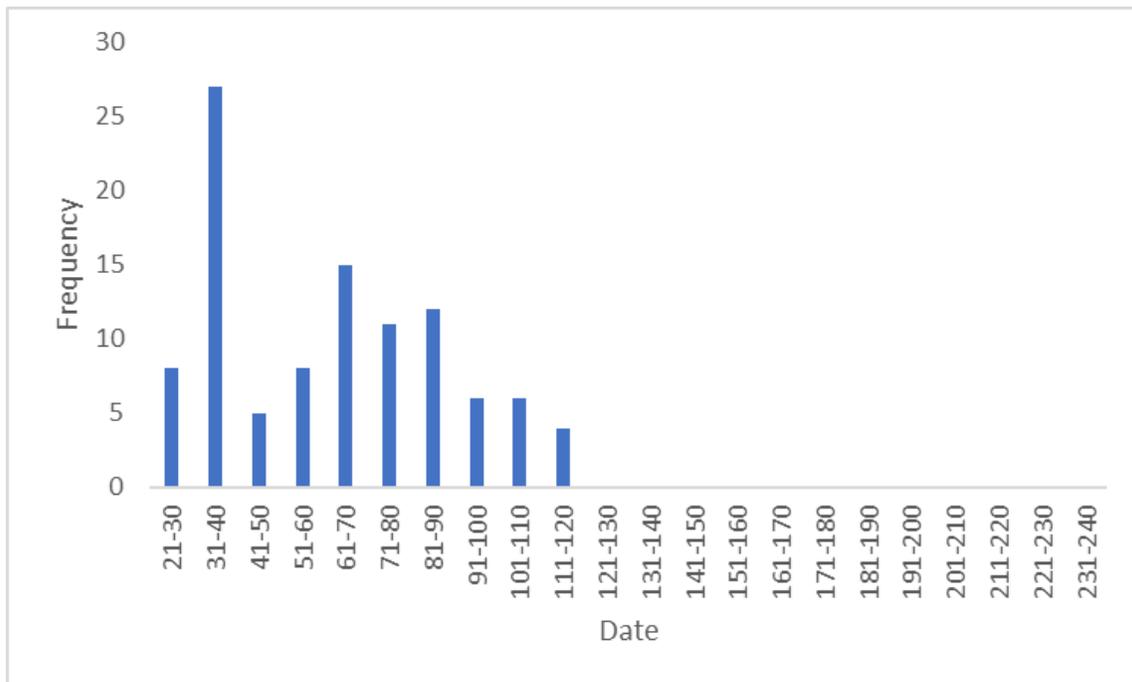
## Middle Fork Willamette – Lookout Point Head of Reservoir

### Target Species

The reporting period began July 1 and ended July 15. 3 Chinook salmon were captured during the 15-day sampling period (Figure 38). The trap was operated 100% 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 39 shows length frequency data to-date.



**Figure 38. Chinook Captured Per Day 07/01/2022 to 07/15/2022 (Lookout Point Head of Reservoir)**



**Figure 39. 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	1	118	118	118	17.5	17.5	17.5
		CHS	Parr	59	59	115	80.0	1.0	19.8	5.9
		CHS	Fry	42	28	69	36.4	N/A	N/A	N/A
July 1-15, 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	N/A	N/A	N/A	N/A	N/A	N/A
		CHS	Parr	0	N/A	N/A	N/A	N/A	N/A	N/A
		CHS	Fry	3	28	29	28.7	N/A	N/A	N/A

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

### Trapping Efficiency

A total of 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 3 Chinook captured during this reporting period. Of these 3 fish, 0 had partial descaling <20% (0.0%) and 0 had body injuries (0.0%). 0 had bodily injuries (0.0%) and 0 had eye injuries (0.0%). 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 Head of Reservoir	3	0	0	0	0	0	0	0

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

### Collected DNA and Scale Samples

No scales and DNA were collected from Chinook captured for the reporting period. All target fish were under sampling minimum thresholds (45 mm FL for DNA and 50 mm FL for scales).

### VIE Marking

Visual Implant Elastomer (VIE) trials commenced on 6/25/2022. Since then, 31 Chinook have been VIE marked to the left of their dorsal fin with fluorescent yellow elastomer. No fish with VIE marks have been detected at downstream RST sites to date.

### Non-Target Species

71 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	2	0
Lamprey	0	0	1	0
Bullhead	0	0	0	0
Bull Trout	0	0	0	0
Crappie	0	0	0	0
Cutthroat Trout	1	0	9	0
Dace	12	0	32	0
Red-Sided Shiner	0	0	2	0
Sculpin	2	0	7	2
Smallmouth Bass	0	0	7	0
Largescale Sucker	2	0	14	1
Mountain Whitefish	3	0	3	0
Northern Pikeminnow	4	0	7	0
<i>O. mykiss</i>	20	1	70	3
<i>O. mykiss</i> (clipped)	0	0	2	0
Chinook (clipped)	22	0	26	0
Unknown	5	0	10	0
<b>Totals</b>	<b>71</b>	<b>1</b>	<b>190</b>	<b>5</b>

## Stream Statistics

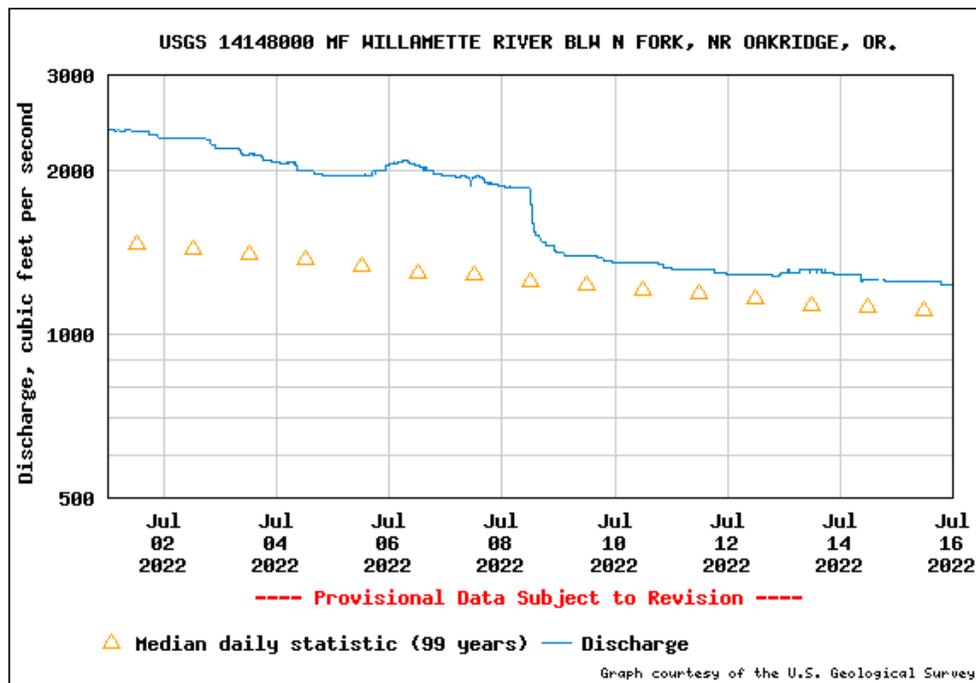
Basic stream statistics for the Lookout Point Head of Reservoir RST site were calculated from data downloaded from the U.S. Geological Survey stream gage number 14148000. During the reporting period, daily maximum values for instantaneous discharge ranged from 1,250.0 cfs to 2,380.0 cfs (mean: 1,749.3 cfs). Figure 40 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. Logger was ripped off the trap prior to this reporting period and a new one was installed on July 7<sup>th</sup>, 2022. The probe operated normally during this period. (Figure 41)

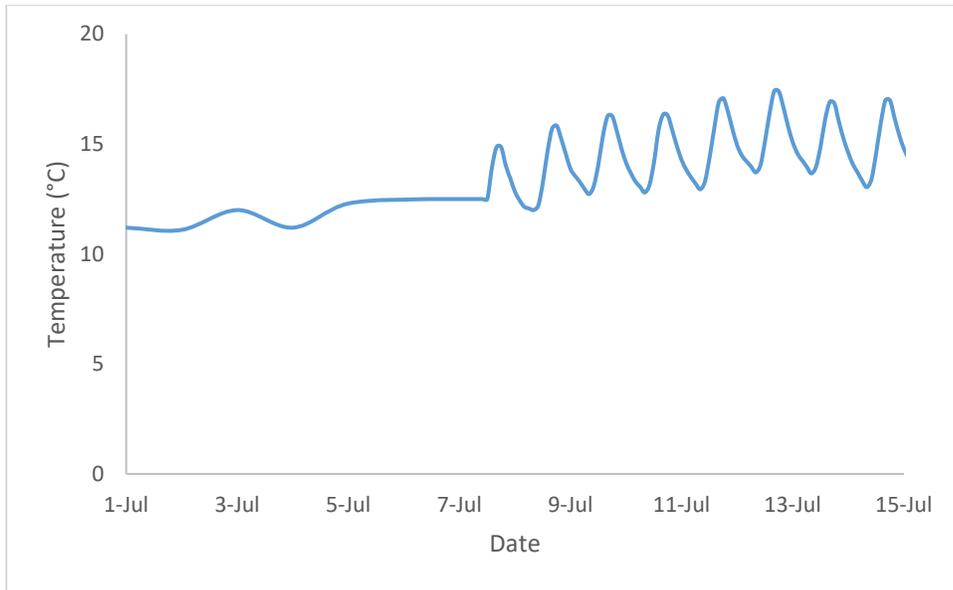
Flows into Lookout Point Reservoir averaged 1,742.4 cfs (Figure 42). Catch per unit of effort (CPUE) data are summarized in Table 43. Discharge and capture data for the duration of monitoring efforts at this location are provided in Appendix B.

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

	Chinook
<b>Description</b>	<b>5 ft</b>
Catch	3
Effort (hrs)	364.1
CPUE (fish/hr)	0.008

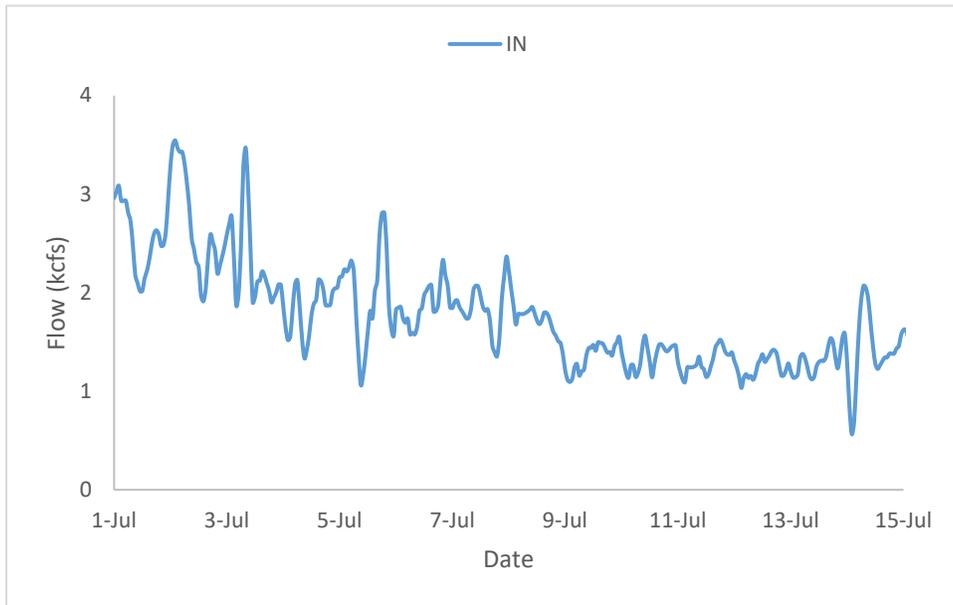


**Figure 40. Discharge (cfs); above Lookout Point Reservoir, Below Oakridge, OR**



Note: Hobo logger was ripped off trap prior to the reporting period. Temperature began recording with a new logger on July 7th, 2022. Data supplemented with daily trap check temperatures from July 1<sup>st</sup>, 2022 to time of logger deployment.

**Figure 41. Temperature at RST (Lookout Point Head of Reservoir)**



**Figure 42. Hourly Flows (Lookout Point Head of Reservoir site)**

### Issues Encountered

Some equipment at the Big Cliff Dam site was stolen, no impact to sampling was incurred. The trap and some equipment was tampered with at the Fall Creek Dam site. It is unknown as to what impact this had on sampling and the trapping efficiency trial that was ongoing during this time. Warm weather and low flows may cause water temperature concerns at some trapping sites in the upcoming weeks.

## **Upcoming USACE Support Services**

None at this time.

# Appendix A

## Chinook (CHS)

Chinook Injuries to-date																								
Site/Trap/Life Stage	Total Fish	MUNK	DS<2	BLO	EYB	FUN	BKD	COP	DS>2	PRD	FID	HBO	BO	HO	BVT	HBP	BRU	TEA	OPD	HIN	FVB	POP	GBD	
Big Cliff Dam		555	317	1	66	2	1	434	138	1	282	5	10	3	21	6	45	18	72	53	22	12	14	
8 ft		555	317	1	66	2	1	434	138	1	282	5	10	3	21	6	45	18	72	53	22	12	14	
Parr		21	6		1	1		14	2		5					2			1					
Smolt		523	311	1	64	1		420	135	1	276	5	10	1	21	4	44	18	70	52	22	11	14	
Unknown		2												2								1		
Fry		9			1		1		1		1						1		1	1				
Cougar Dam		1203	10	472	3	81	5	3	493	134	3	261	2	4	2	18	2	32	26	67	40	24	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		822	10	260	1	21	3		241	55		110		4	2	12		13	17	25	15	15	4	3
Parr		238		129		11	1		96	22		53		1		5		3	4	10	6	5		
Smolt		201		129	1	6	2		145	27		52		3		6		8	6	12	6	10	1	3
Unknown		2													2									
Fry		381	10	2		4			6		5					1		2	7	3	3		3	
Dexter Dam Tail.		95		58		5			11	23		45				1		3	4	6	6	4		20
5 ft		95		58		5			11	23		45				1		3	4	6	6	4		20
Parr		16		6		2			2	6		8							2	3	2			6
Smolt		76		52		3			9	17		36				1		3	2	3	4	4		14
Fry		3										1												
Lookout Dam Tail.		78		41	1	15	1		14	28		44				2	2	9	1	15	9	6		8
PH 1		28		11	1	7			7	14		19				2	2	6		8	2	1		2
Parr		3				1				2		2					1	1		1				
Smolt		25		11	1	6			7	12		17				2	1	5		7	2	1		2
PH 2		12		10		3			2	2		9						1	1	2	4	1		
Parr		4		4		3				1		4						1	1	1	3			
Smolt		8		6					2	1		5								1	1	1		
Spill		38		20		5	1		5	12		16						2		5	3	4		6
Parr		6		1						3		1												
Smolt		32		19		5	1		5	9		15						2		5	3	4		6
Lookout Point HOR		99		30					1			10						1		1				
5 ft		99		30					1			10						1		1				
Parr		59		29					1			9						1		1				
Smolt		1																						
Fry		39		1								1												

### Chinook (CHS)

Chinook Injuries During Reporting Period (7-1-2022 to 7-15-2022)																							
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	59		39					25	5		23				1		1	4	3	4	5	4	
8 ft	59		39					25	5		23			1		1	4	3	4	5	4		
Parr	1		1					1			1												
Smolt	58		38					24	5		22			1		1	4	3	4	5	4		
Cougar Dam	12		6					5	3		4				1			1	1	1	2		
PH	12		6					5	3		4				1			1	1	1	2		
Parr	4		1						2		2							1		1			
Smolt	8		5					5	1		2				1				1		2		
Dexter Dam Tail.	11		8						1		4										1		
5 ft	11		8						1		4										1		
Parr	1		1																				
Smolt	9		7						1		4										1		
Fry	1																						
Lookout Dam Tail.	19		13		3			3	7		7							1		7	2	3	2
PH 1	6		2		2			2	2		2									3	1		1
Smolt	6		2		2			2	2		2									3	1		1
PH 2	5		4		1				1		5									2	1	1	
Parr	1		1		1						1									1	1		
Smolt	4		3						1		4									1		1	
Spill	8		7					1	4									1		2		2	1
Smolt	8		7					1	4									1		2		2	1
Lookout Point HOR	3																						
5 ft	3																						
Fry	3																						

### Steelhead (O. mykiss)

O. mykiss Injuries to-date																								
Site/Trap/Life Stage	Total Fish	MUNK	DS<2	BLO	EYB	FUN	BKD	COP	DS>2	PRD	FID	HBO	BO	HO	BVT	HBP	BRU	TEA	OPD	HIN	FVB	POP	GBD	
Big Cliff Dam	21		9					9	4		8				1		3	2	4	6			1	
8 ft	21		9					9	4		8				1		3	2	4	6			1	
Adult	1								1		1									1	1			
Parr	2																				1			
Smolt	13		9					9	3		7				1		3	2	3	4			1	
Fry	5																							
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	90		25					1			11								1					
5 ft	90		25					1			11								1					
Adult	7		1								2													
Parr	17		7					1			2													
Smolt	35		17								7							1						
Fry	31																							

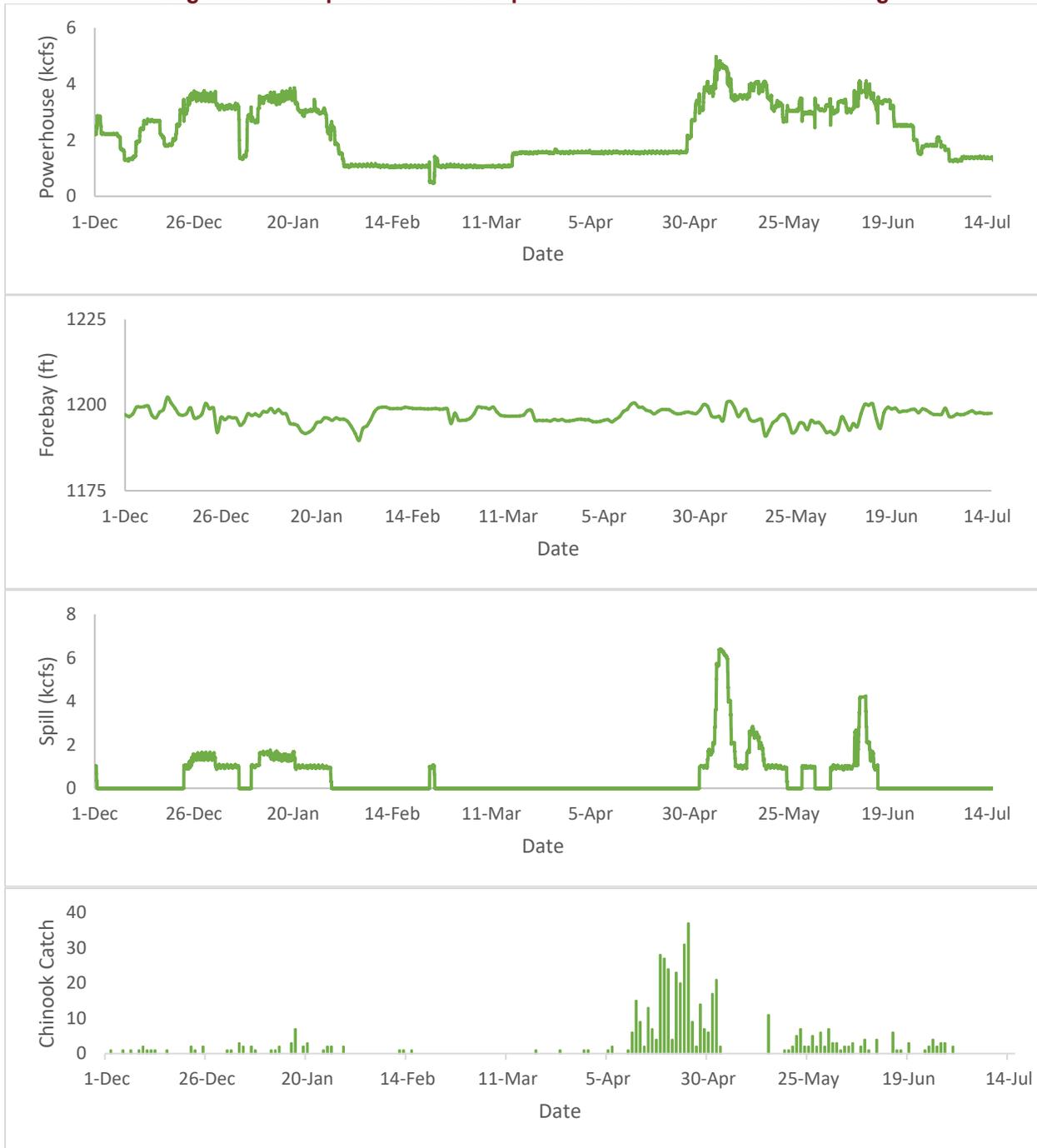
### Steelhead (O. mykiss)

O. mykiss Injuries During Reporting Period (7-1-2022 to 7-15-2022)																							
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	3																						
8 ft	3																						
Fry	3																						

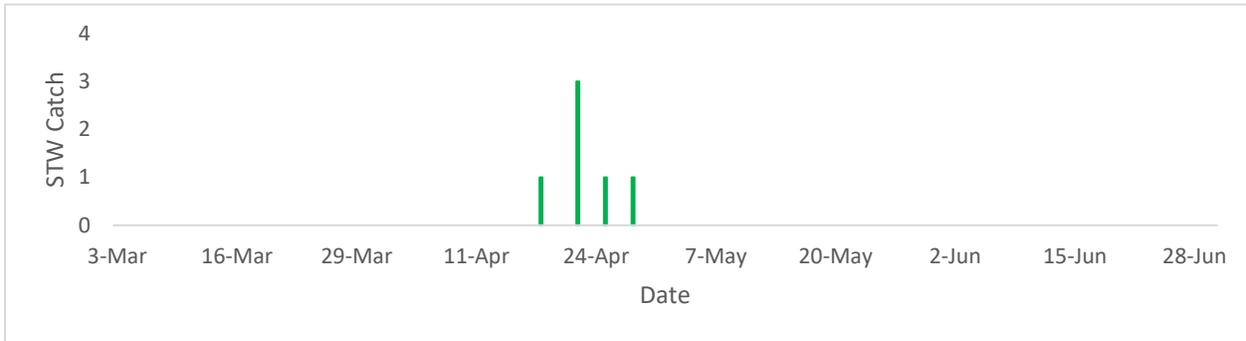
<b>Injury Code</b>	<b>Description of Injury/Condition</b>
NXI	Live fish with no external injuries
MUNK	Mortality with no external injuries
DS<2	Descaling <20%
BLO	Bloated
EYB	Bloody Eye (hemorrhage)
BVT	Bleeding from Vent
FVB	Fin Blood Vessels Broken
GBD	Gas Bubble Disease (fin ray/eye inclusions)
POP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

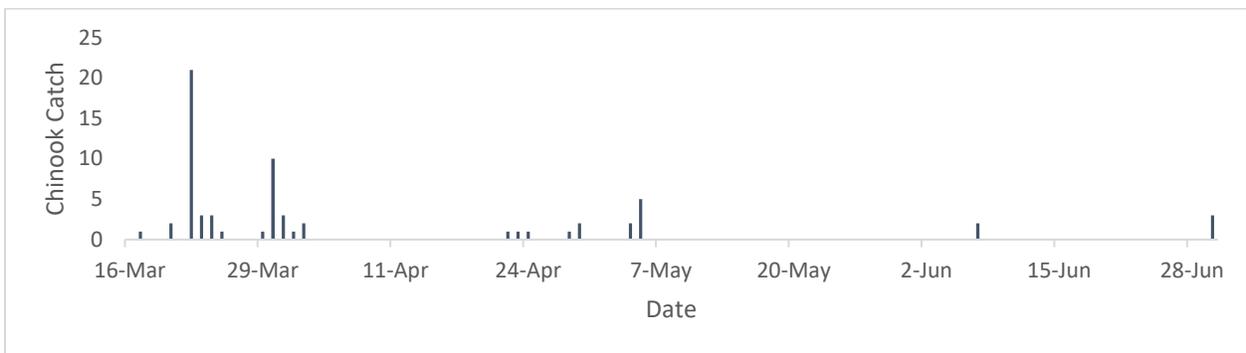
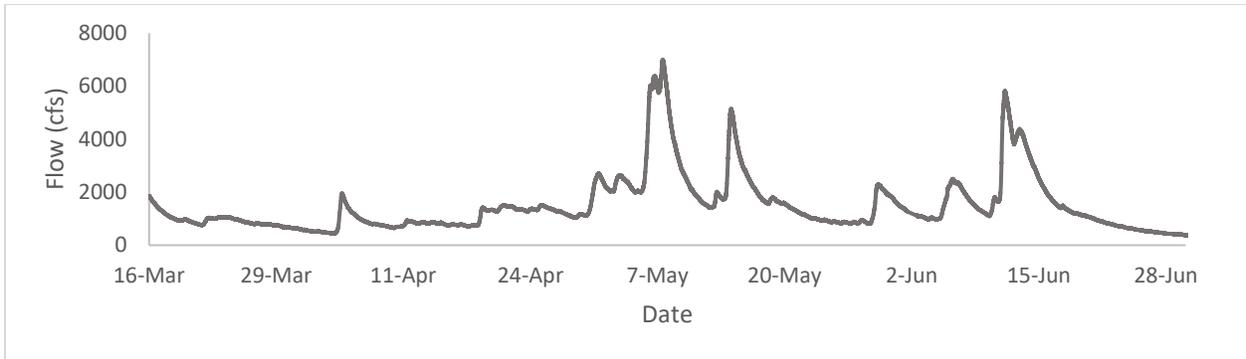
### Big Cliff Dam Operational and Capture Data Since Start of Monitoring

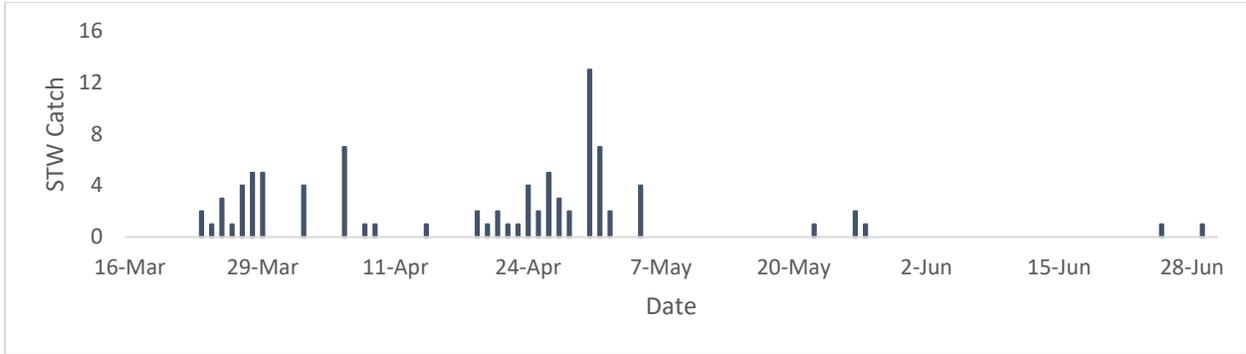




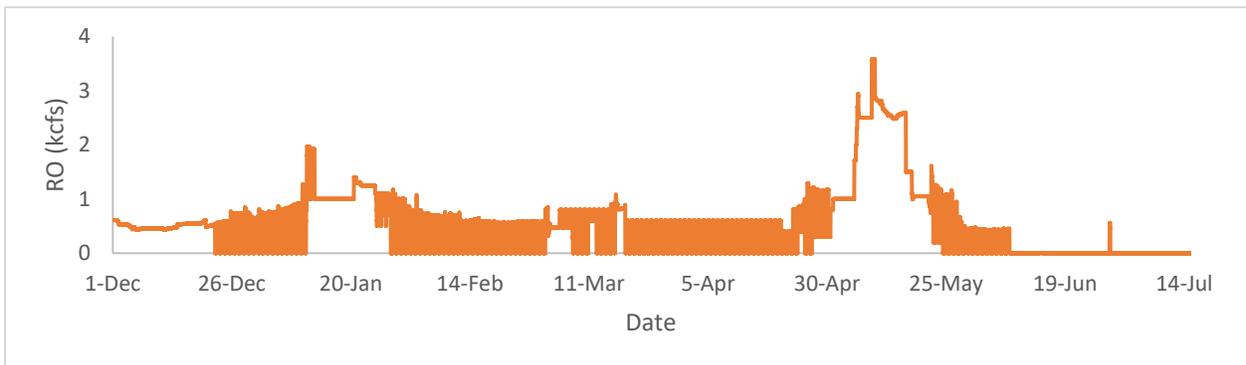
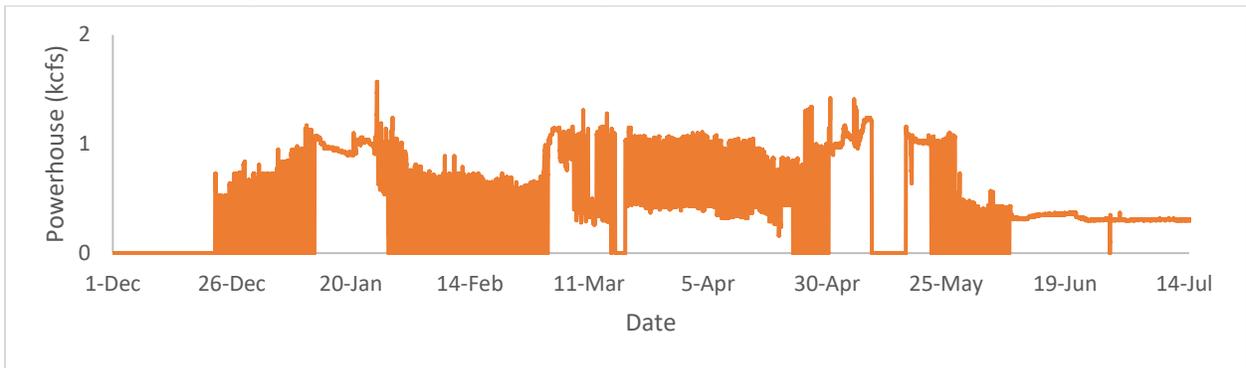


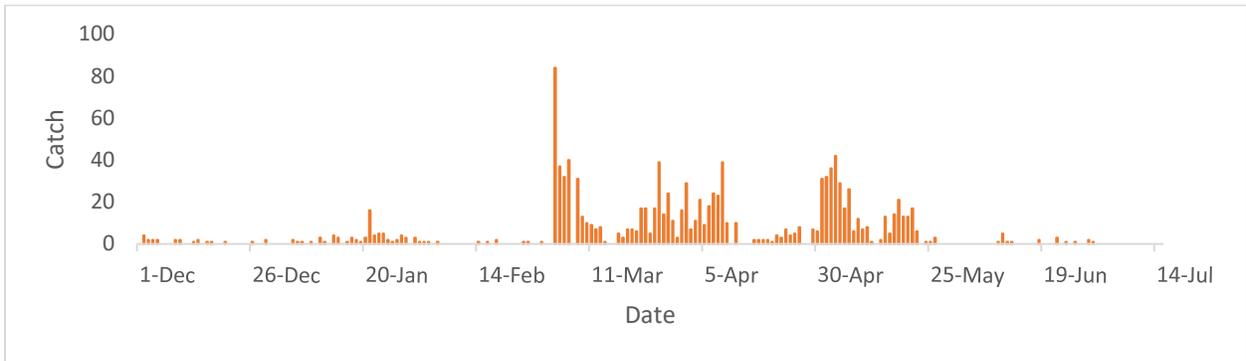
**South Santiam River Above Foster Dam Discharge and Foster Dam Head of Reservoir Capture Data**



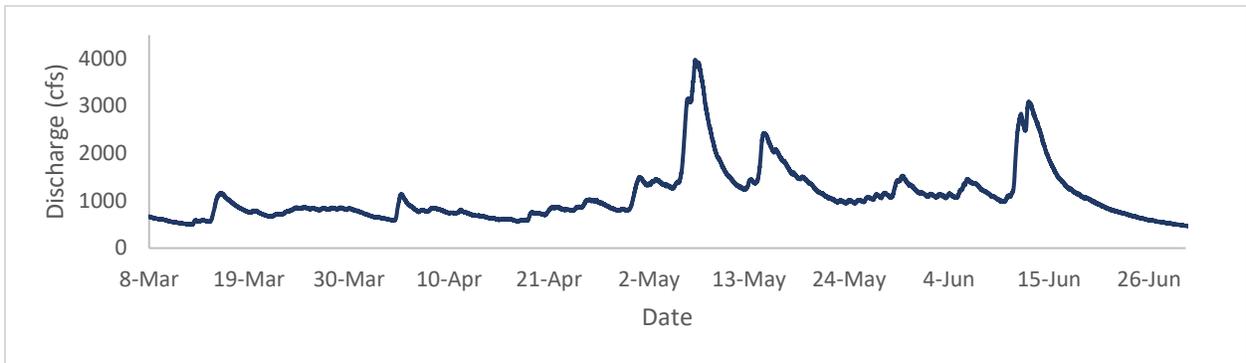


**Cougar Dam Operational and Capture Data Since Start of Monitoring**

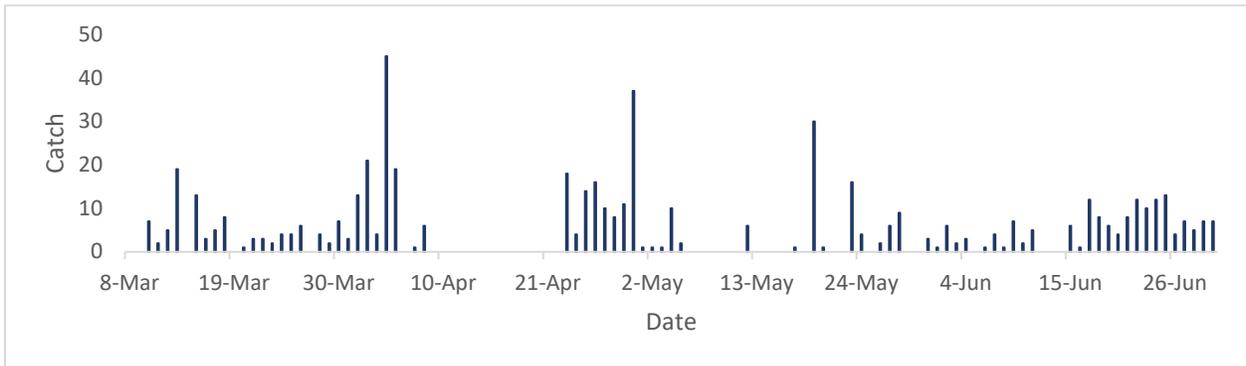




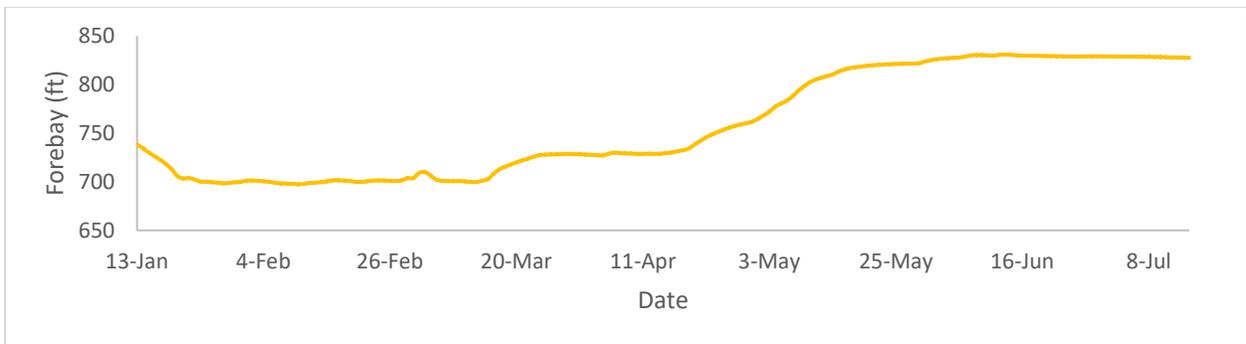
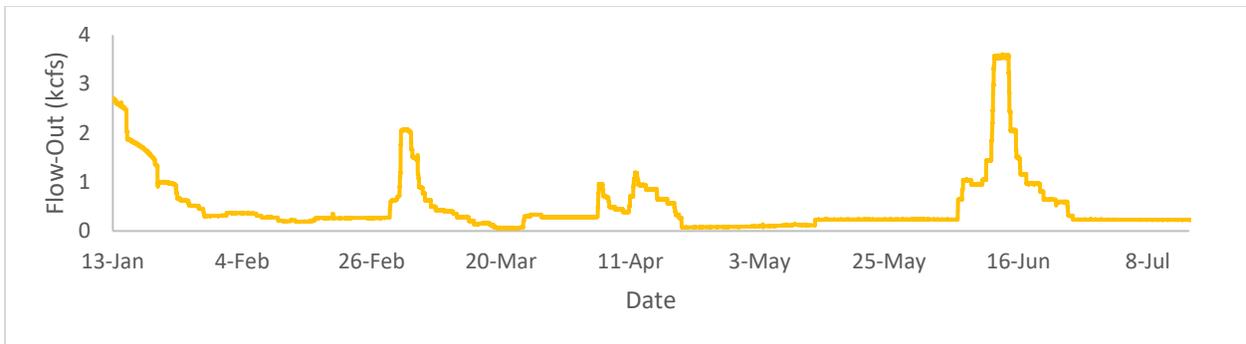
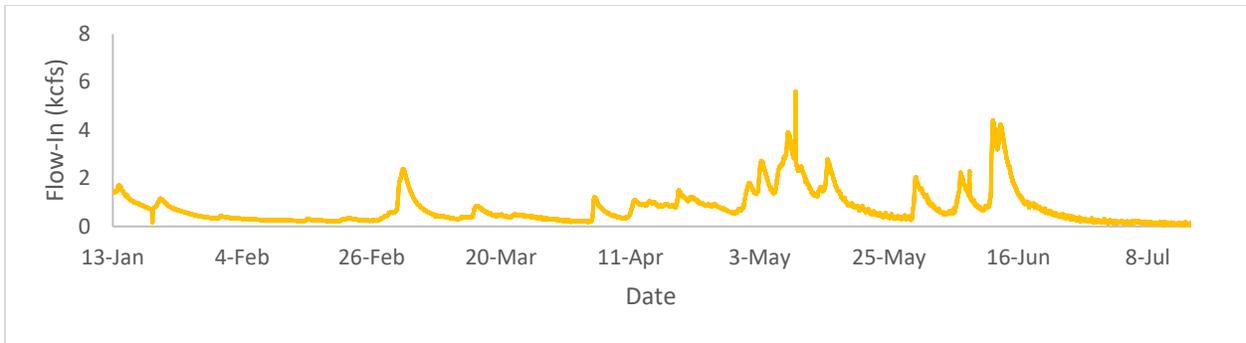
**South Fork McKenzie above Cougar Dam Discharge and Cougar Dam Head of Reservoir Capture Data Since Start of Monitoring**



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

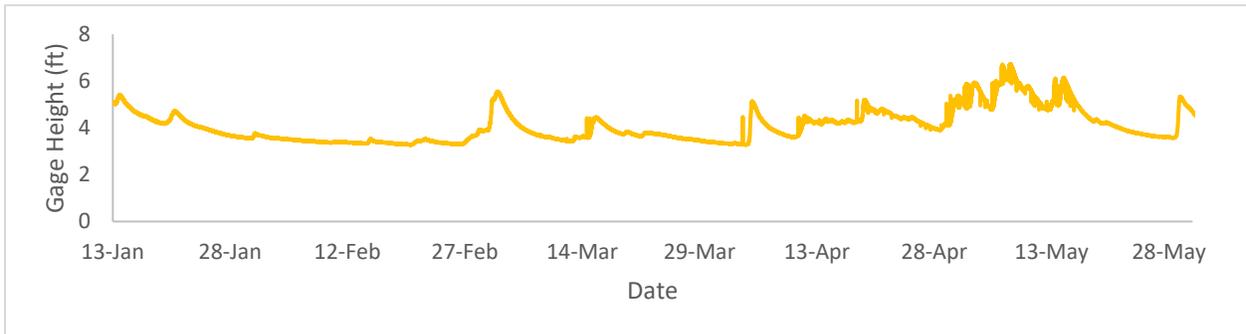


**Fall Creek Dam Tailrace Operational and Capture Data Since Start of Monitoring**

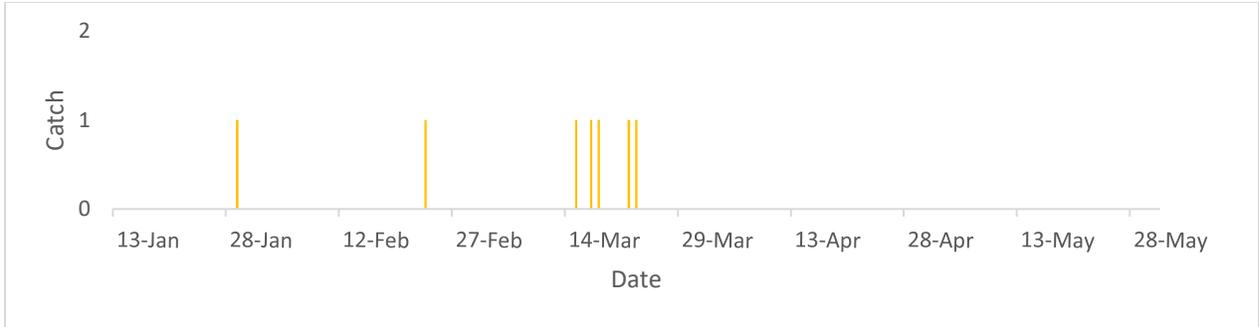


Note: Operational data was being tracked for Fall Creek Head of Reservoir site prior to initiation of Fall Creek Dam monitoring.

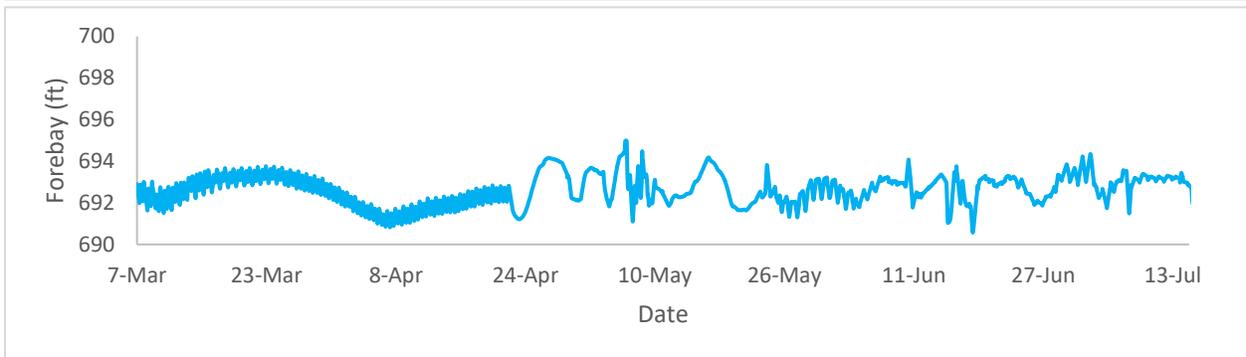
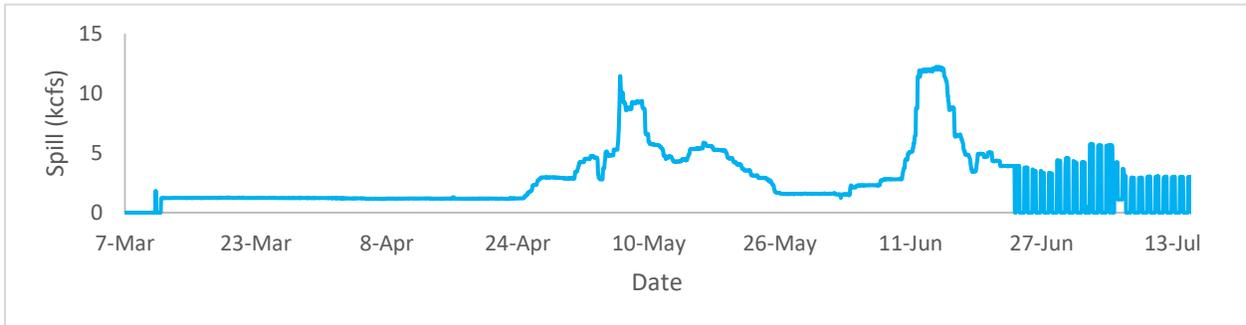
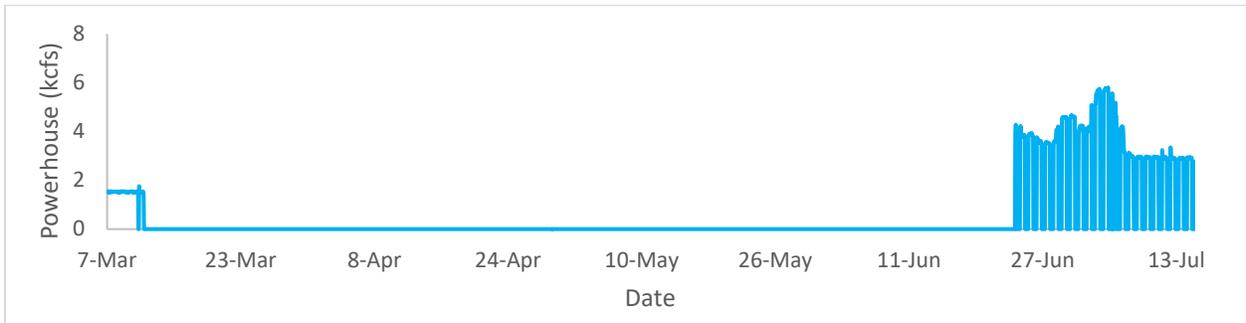
**Fall Creek Head of Reservoir Operational and Capture Data Since Start of Monitoring**

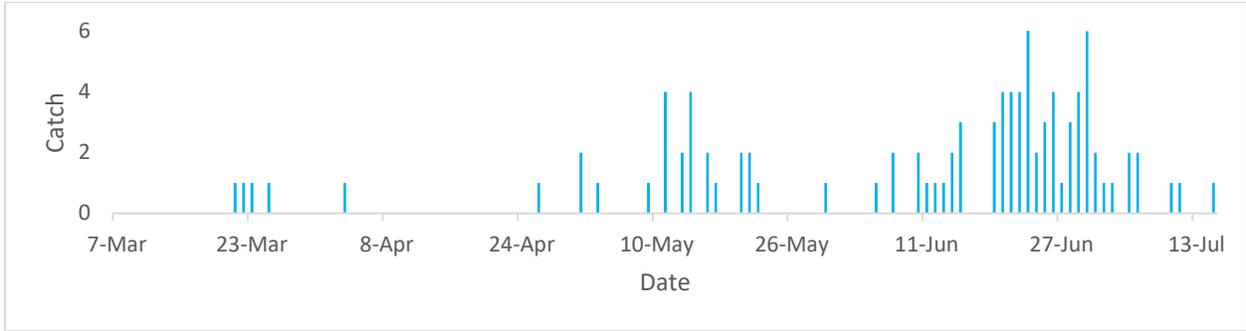


Note: Gage height data was taken from USGS stream gage number 14150290, 1.2 rkms downstream.

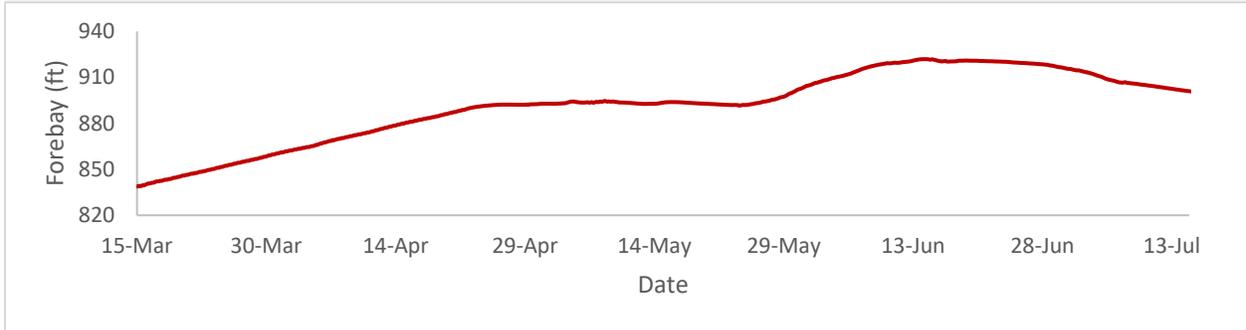
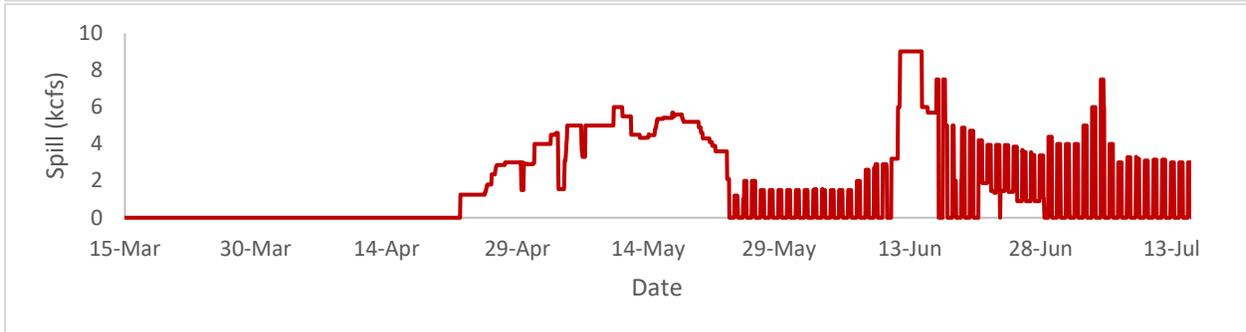
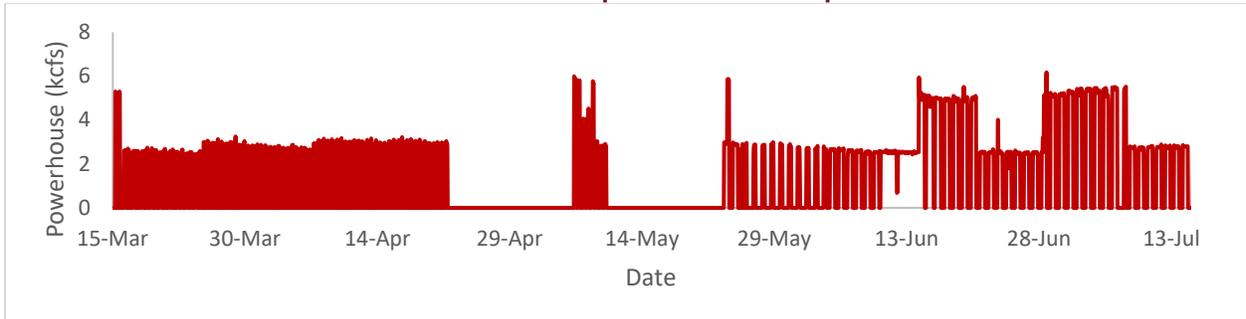


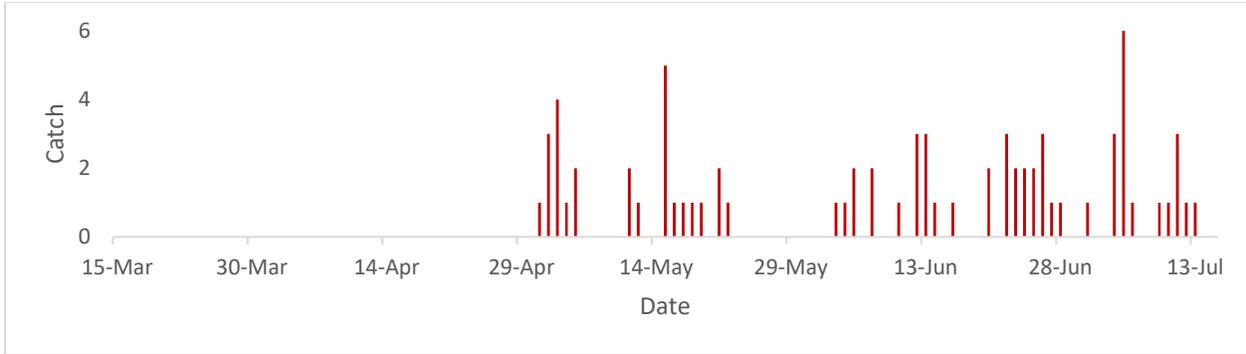
**Dexter Dam Operational and Capture Data Since Start of Monitoring**



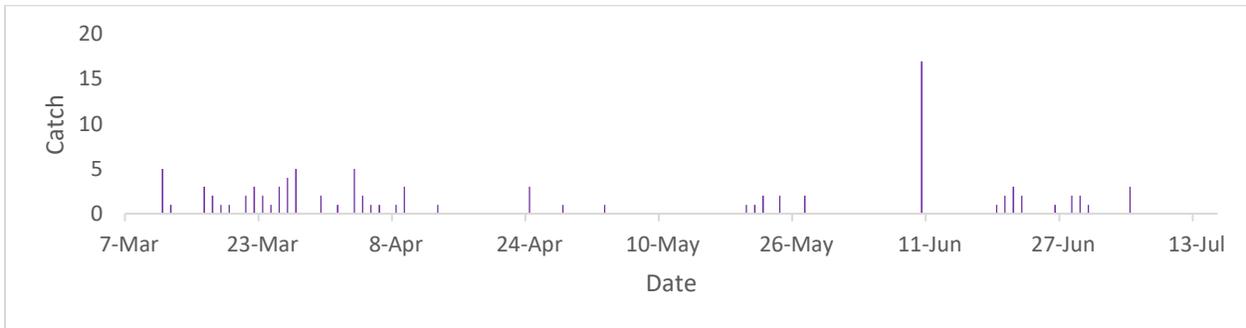
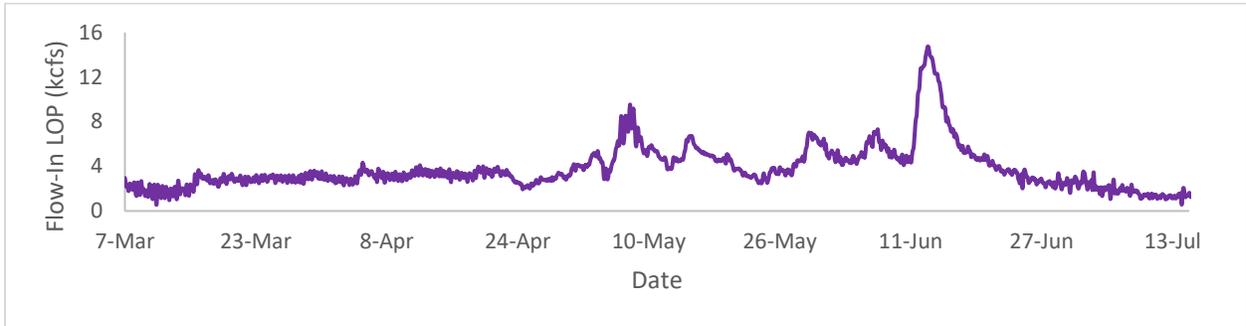


**Lookout Dam Tailrace Operational and Capture Data**

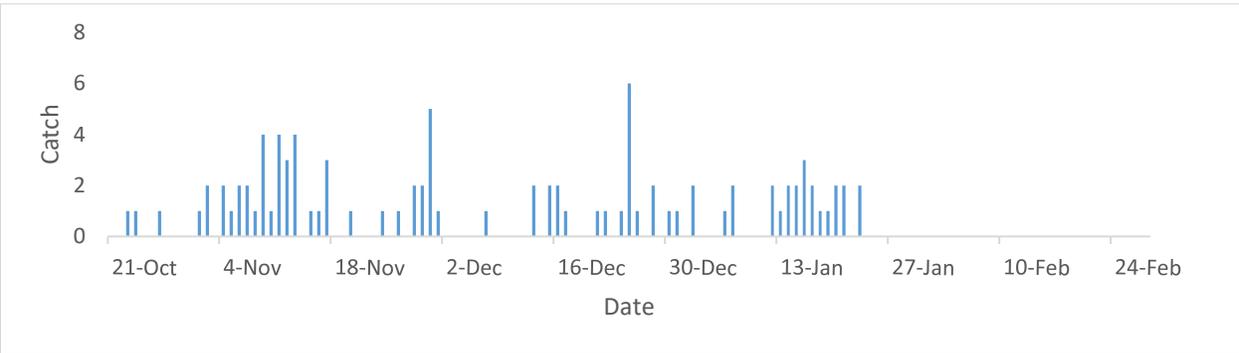
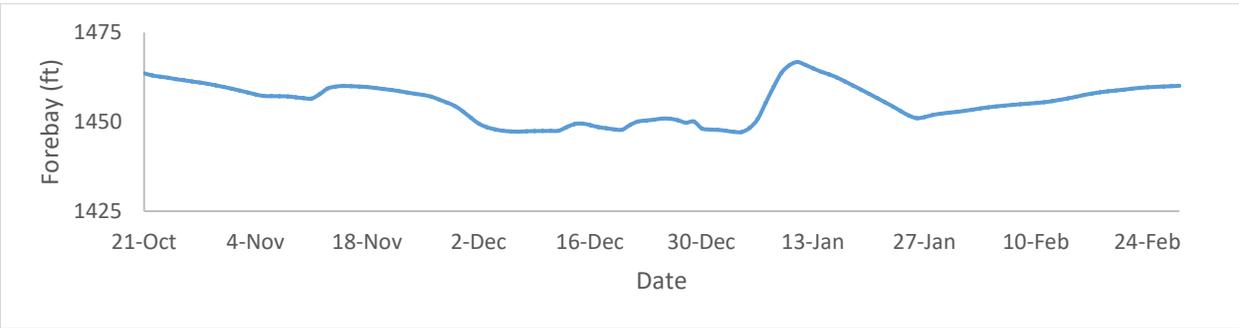
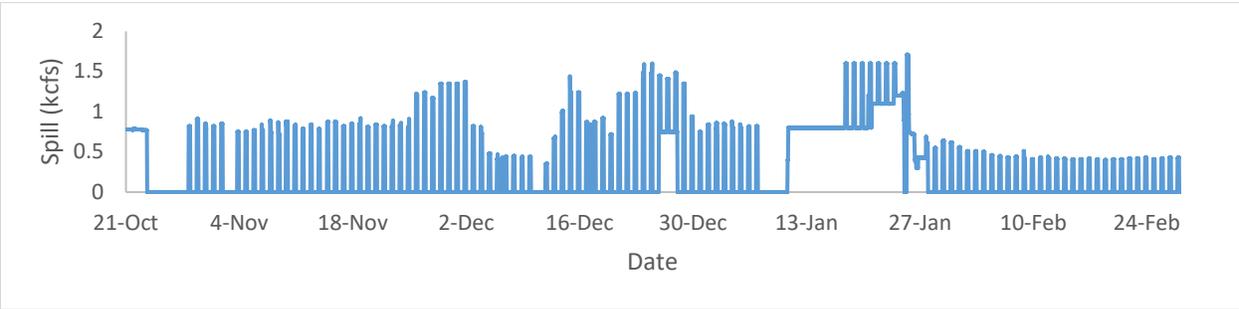
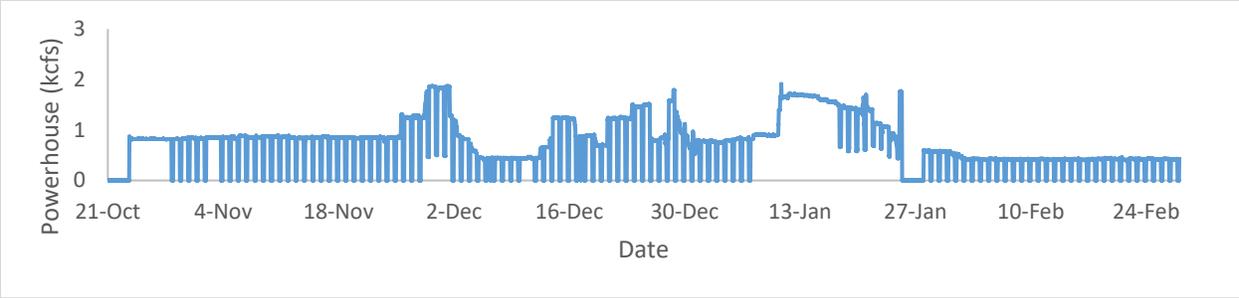




**Lookout Point Head of Reservoir Operational and Capture Data Since Start of Monitoring**



**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)**

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

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

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

**Cougar Dam Trapping Efficiency (04/20/2022)**

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

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

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

**Lookout Point Head of Reservoir Trapping Efficiency Releases**

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

04/14/2022	989	19	1.9% (19/989)
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**Lookout Point Head of Reservoir Trapping Efficiency Release (6/8/2022)**

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

**Fall Creek Dam Trapping Efficiency Release (6/30/2022)**

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

## Appendix D

### Summary of Project PIT Tagged Fish for Reporting Period

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

### 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**

\*No fish were PIT tagged this reporting period.