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Report Period: August 16 to August 31, 2022

Report No.: 2022 Willamette RST Bi-Weekly Report 08/16 – 08/31 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	02/15/2022	292
Big Cliff Dam RST	Operation	03/15/2022	10/15/2022	
Big Cliff Dam Tailrace	Trap Efficiency Release (1,000 Fish)	12/22/2021	12/22/2021	1
Big Cliff Dam Tailrace	Temporary Trap Removal and Install	05/06/2022	05/13/2022	7
Big Cliff Dam Tailrace	Trap Efficiency Release (1,000 Fish)	05/25/2022	05/25/2025	1
Big Cliff Dam Tailrace	Trap Efficiency Release (1,000 Fish)	08/09/2022	08/09/2022	1
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	01/19/2022	1
Cougar Dam	Trap Efficiency Release (735 Fish, ~365 per route)	04/20/2022	04/20/2022	1
Cougar Dam	Trap Efficiency Release (993 Fish, RO route)	05/15/2022	05/15/2022	1
Cougar Dam	Trap Efficiency Release (500 Fish, PH route)	07/19/2022	07/19/2022	1
Cougar Dam	Trap Efficiency Release (501 Fish, PH route)	08/11/2022	08/11/2022	1
Cougar Dam Head of Reservoir	Highline and Trap Install	03/07/2022	03/07/2022	1
Cougar Dam Head of Reservoir	Operation	03/08/2022	06/30/2022	115

Cougar Dam Head of Reservoir	Trap Efficiency Release (806 Fish)	03/18/2022	03/18/2022	1
Cougar Dam Head of Reservoir	Trap Efficiency Release (500 Fish)	05/19/2022	05/19/2022	1
Cougar Dam Head of Reservoir	Trap Efficiency Release (515 Fish)	06/23/2022	06/23/2022	1
Cougar Dam Head of Reservoir	Trap Removal	07/01/2022	07/01/2022	1
Dexter Dam Tailrace RST	Highline Install	03/02/2022	03/02/2022	1
Dexter Dam Tailrace RST	Trap Install	03/03/2022	03/03/2022	1
Dexter Dam Tailrace RST	Operation	03/07/2022	12/16/2022	285
Dexter Dam Tailrace RST	Trap Efficiency Release (988 Fish)	03/23/2022	03/23/2022	1
Dexter Dam Tailrace RST	Trap Efficiency Release (1000 Fish)	05/04/2022	05/04/2022	1
Dexter Dam Tailrace RST	Trap Efficiency Release (1019 Fish)	05/24/2022	05/24/2022	1
Dexter Dam Tailrace RST	Trap Efficiency Release (981 Fish)	07/21/2022	07/21/2022	1
Lookout Dam Tailrace RSTs	Operation	03/15/2022	07/31/2022	139
Lookout Dam Tailrace RSTs	Trap Efficiency Release (1,013 fish, PWR route)	04/13/2022	04/13/2022	1
Lookout Point Head of Reservoir RST	Trap Install	03/06/2022	03/06/2022	1
Lookout Point Head of Reservoir RST	Operation	03/07/2022	12/16/2022	285
Lookout Point Head of Reservoir RST	Trap Efficiency Release (993 fish)	04/05/2022	04/05/2022	1
Lookout Point Head of Reservoir RST	Trap Efficiency Release (989 fish)	04/14/2022	04/14/2022	1
Lookout Point Head of Reservoir RST	Trap Efficiency Release (1007 fish)	05/18/2022	05/18/2022	1
Lookout Point Head of Reservoir RST	Trap Efficiency Release (1005 fish)	07/20/2022	07/20/2022	1
Fall Creek Dam Tailrace RST	Operation	03/15/2022	07/15/2022	123
Fall Creek Dam Tailrace RST	Trap Efficiency Release (518 fish)	06/08/2022	06/08/2022	1
Fall Creek Dam Tailrace RST	Trap Efficiency Release (513 fish)	06/30/2022	06/30/2022	1
Fall Creek Dam Tailrace RST	Trap Efficiency Release (500 fish)	07/13/2022	07/13/2022	1
Fall Creek Head of Reservoir RST	Trap and Highline Install	01/11/2022	01/11/2022	1
Fall Creek Head of Reservoir RST	Operation	01/02/2022	05/31/2022	150
Fall Creek Head of Reservoir RST	Removal	06/02/2022	06/02/2022	1
Hills Creek Dam RO and PWR	Deployment	10/12/2021	10/12/2021	1
Hills Creek Dam RO	Operation	10/15/2021	03/01/2022	138
Hills Creek Dam PWR	Operation	10/15/2021	03/01/2022	138
Hills Creek Dam	Trap Efficiency Release (1,200 fish, 600 per route)	01/6/2022	01/6/2022	1
Hills Creek Dam	Trap Efficiency Release (1,200 fish, 600 per route)	02/16/2022	02/16/2022	1
Hills Creek Dam	Trap Efficiency Release (1,200 fish, 600 per route)	02/23/2022	02/23/2022	1
Hills Creek Dam RSTs	Trap Removal	03/01/2022	03/01/2022	1

## 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 five locations: Big Cliff Dam, Cougar Dam, 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. The trap at Fall Creek Dam was placed into a non-sampling position on July 16<sup>th</sup> at the end of the sampling period. 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>.

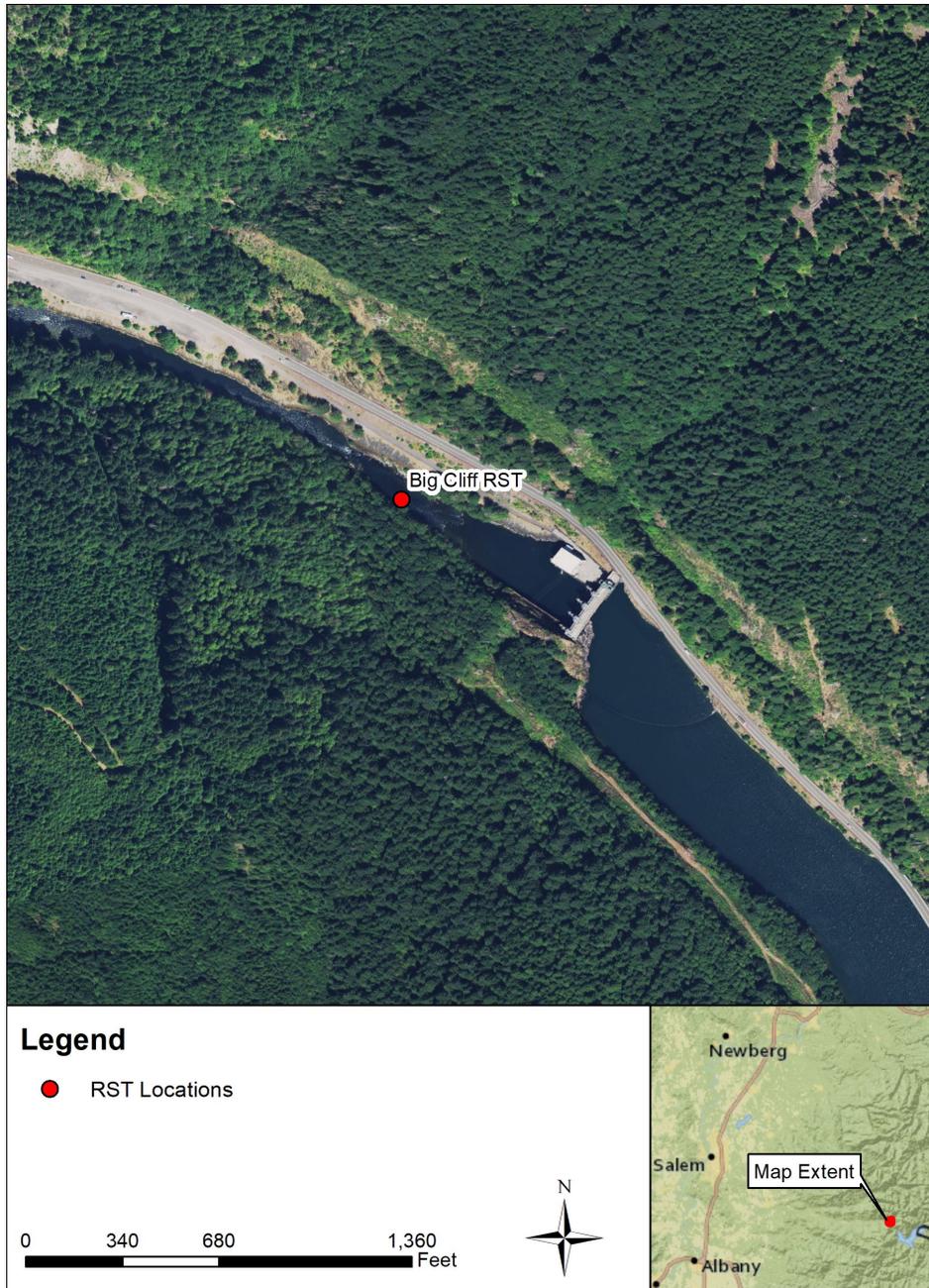
The RST's at Big Cliff Dam and Lookout Dam Tailrace started sampling on March 15<sup>th</sup>. On March 1<sup>st</sup> the Middle Fork Willamette River below Hills Creek Dam RST's were removed for the sampling season in conjunction with the end of RO spill and to prioritize the limited number of screw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

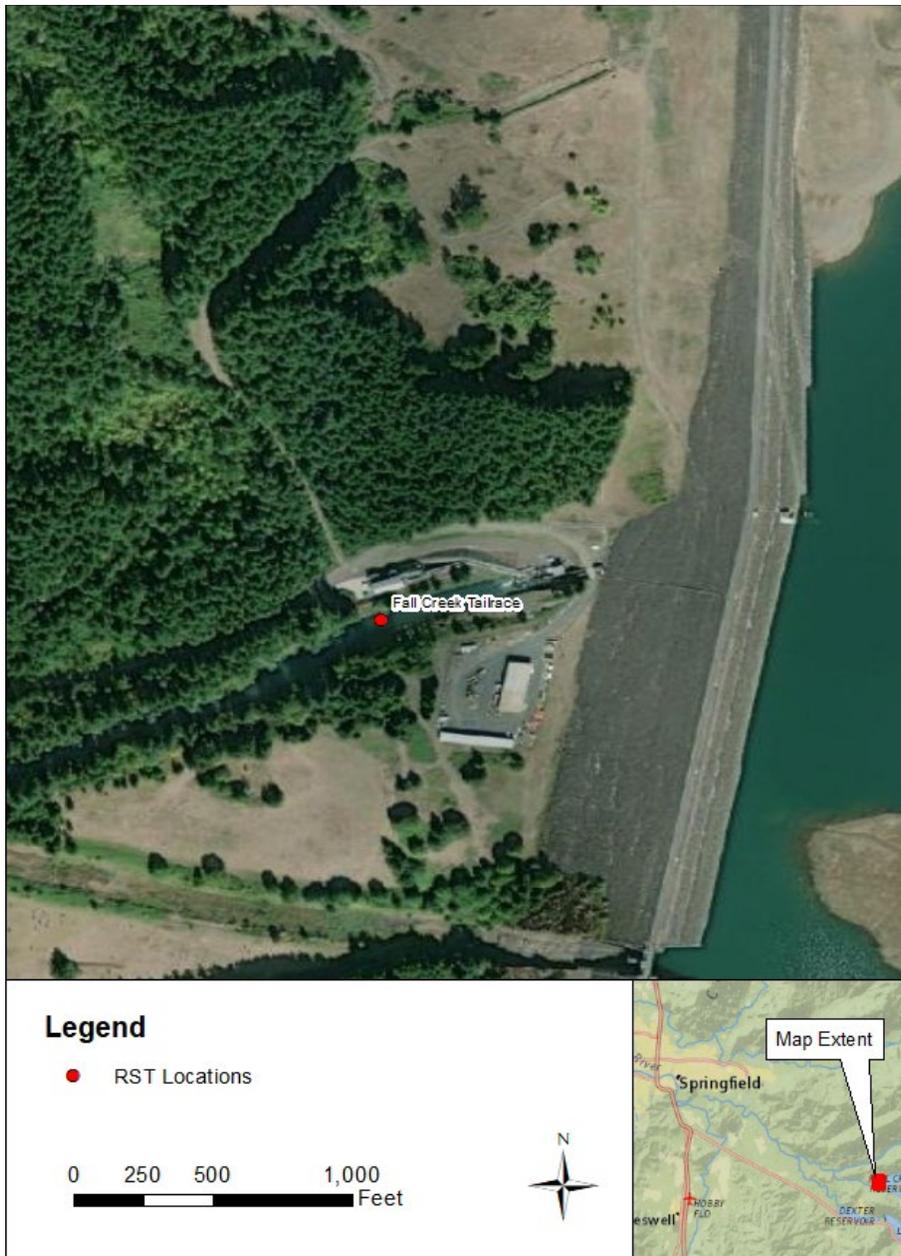
Sampling start dates are included in Table 2, and season total collection numbers are displayed in Table 3. The locations of the RST's are depicted in Figures 1 through 6.



**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	8/16/2022	8/31/2022	15	229
Green Peter Tailrace- Middle Santiam River	3/2/2022	8/16/2022	8/31/2022	0	67
Foster Dam Head of Reservoir- South Santiam	3/16/2022	8/16/2022	8/31/2022	0	100
Cougar Dam PH	12/1/2021	8/16/2022	8/31/2022	14	266
Cougar Dam RO	12/1/2021	8/16/2022	8/31/2022	15	268
Cougar Dam Head of Reservoir	3/7/2022	8/16/2022	8/31/2022	0	100
Fall Creek Dam Tailrace*	3/15/2022	8/16/2022	8/31/2022	0	123
Dexter Dam Tailrace	3/7/2022	8/16/2022	8/31/2022	15	176
Lookout Point Dam PH	3/15/2022	8/16/2022	8/31/2022	15	153
Lookout Point Dam Spill	3/15/2022	8/16/2022	8/31/2022	15	153
Lookout Point Head of Reservoir	3/10/2022	8/16/2022	8/31/2022	15	170

\*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**

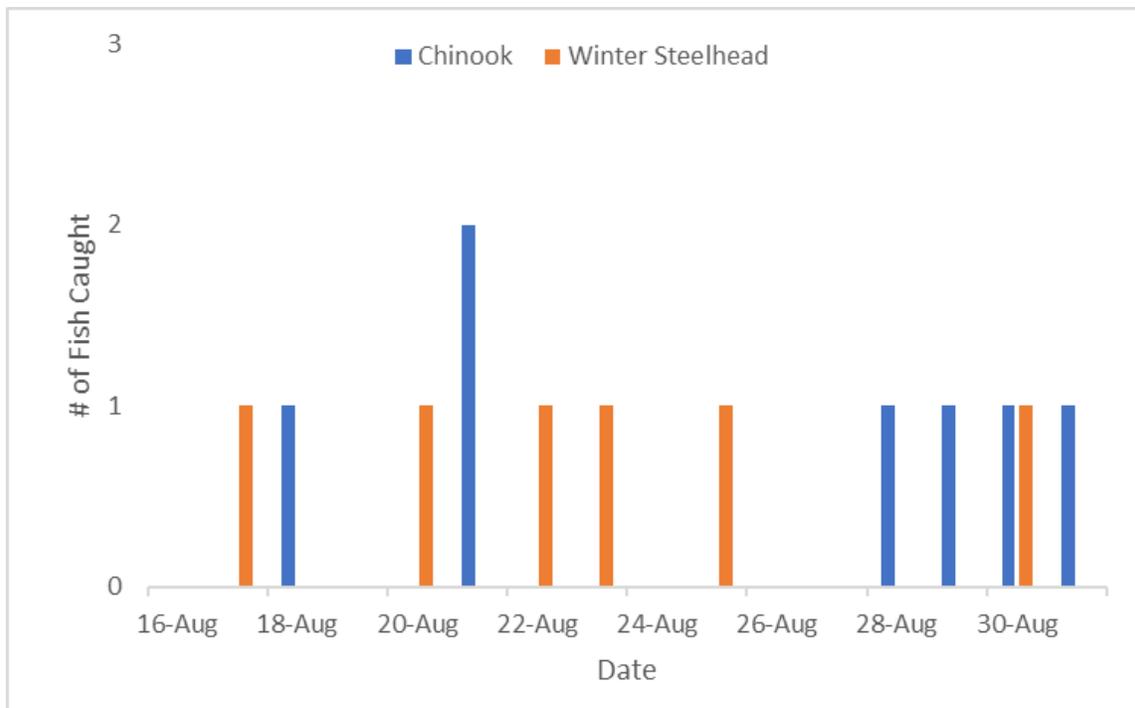
Site	Species	Catch (Reporting Period)	Recaptures (Reporting Period)	Total Catch	Total Recaptures
Big Cliff Dam	CHS	7	0	1047	153
Big Cliff Dam	STW	6	0	51	0
Green Peter Tailrace- Middle Santiam	CHS	0	0	0	13
Green Peter Tailrace- Middle Santiam	STW	0	0	6	0
Foster Dam Head of Reservoir- South Santiam	CHS	0	0	66	0
Foster Dam Head of Reservoir- South Santiam	STW	0	0	90	1
Cougar Dam	CHS	19	2	1248	392
Cougar Dam Head of Reservoir	CHS	0	0	576	71
Fall Creek Dam Tailrace	CHS	0	0	0	11
Dexter Dam Tailrace	CHS	0	0	96	113
Lookout Point Dam	CHS	0	0	78	2
Lookout Point Head of Reservoir	CHS	0	0	101	206

## North Santiam – Big Cliff Dam

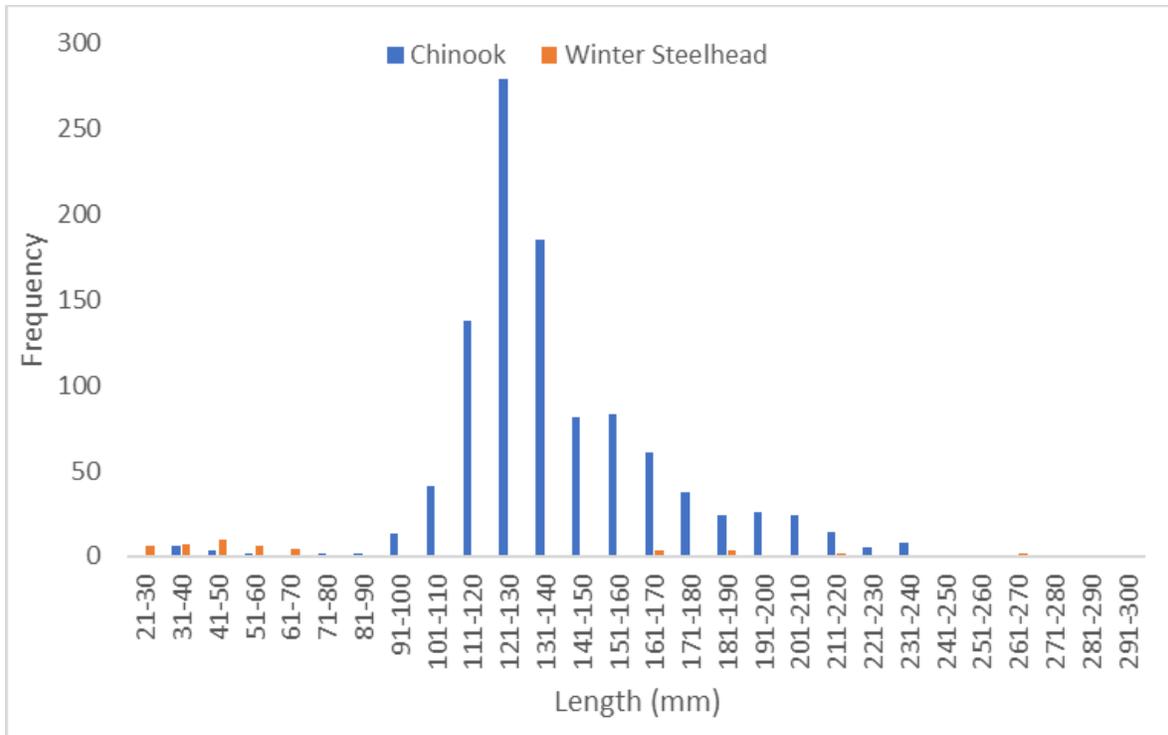
The RST on the North Santiam River below Big Cliff Dam was not sampled while fish passage measures were not being implemented from 16 February 2022 to 14 March 2022. Sampling resumed on 15 March 2022 in accordance with Task 2.2.

### Target Species

This reporting period began on August 16 and ended on August 31. There were a total of 7 Chinook Salmon (CHS) and 6 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 08/16/2022 to 08/31/2022 (Big Cliff)**



\*Figure does not include fish without heads

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

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

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

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

To-Date (Since Dec. 01, 2021)										
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Big Cliff	PWR	CHS	Fry	9	31	48	37.5	1.2	1.4	1.4
		CHS	Parr	24	58	136	98.3	2.1	30.0	11.6
		CHS	Smolt	1012	91	260	141.7	8.9	212.2	33.4
		STW	Fry	27	21	52	40.1	1.1	1.9	1.6
		STW	Parr	8	51	111	67.6	1.9	14.3	4.6
		STW	Smolt	16	157	280	209.4	36.1	230.5	97.0

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

August 16-31, 2022										
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Big Cliff	PWR	CHS	Fry	0	N/A	N/A	N/A	N/A	N/A	N/A
		CHS	Parr	0	N/A	N/A	N/A	N/A	N/A	N/A
		CHS	Smolt	7	133	149	140.3	24.5	37.0	29.7
		STW	Fry	2	43	44	43.5	1.4	1.6	1.5
		STW	Parr	3	51	61	57.0	2.4	2.9	2.7
		STW	Smolt	1	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.

## 24-Hour Post Collection Holding Trial

7 Spring Chinook and 5 Winter Steelhead were captured during the current reporting period and held for 24 hours. 0 Chinook (0.0%) and 0 Winter Steelhead (0.0%) died in holding.

## Injuries and Copepod Infection

Partial descaling <20% was observed in 3 of the 7 Chinook captured (57.1%), 3 displayed descaling >20% (42.9%), 7 displayed body injury (100.0%), 0 had eye injury (0.0%), 6 had copepods present in the branchial cavity (85.7%) and 5 had copepods on fins (71.4%). 0 Chinook displayed gas bubble disease (0.0%). There were 0 mortalities (0.0%).

Partial descaling <20% was observed in 3 of the 6 Winter Steelhead captured (50.0%) and 1 displayed descaling >20% (16.7%), 3 displayed body injury (50.0%), 0 had eye injury (0.0%), 0 had copepods present in the branchial cavity (0%) and 0 had copepods on fins (0.0%). There was 1 mortality (16.7%).

**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	7	4	3	7	0	6	5	0
Big Cliff Dam	Winter Steelhead	6	3	1	3	0	0	0	1

### Non-Target Species

3 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	0	0	60	10
Bullhead	0	0	5	0
Chinook (Adult)	0	0	1	1
Chinook (clipped)	0	0	8	0
Crappie	0	0	0	0
Cutthroat	0	0	3	0
Kokanee	3	0	124	39
<i>O. mykiss</i> (clipped)	0	0	7	3
Pumpkinseed	0	0	75	5
Unknown	0	0	4	1
Whitefish	0	0	4	0
<b>Totals</b>	<b>3</b>	<b>0</b>	<b>285</b>	<b>57</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 1,108.6 feet to 1,109.2 feet (mean: 1,108.8 feet). Figure 9 shows instantaneous gage height.

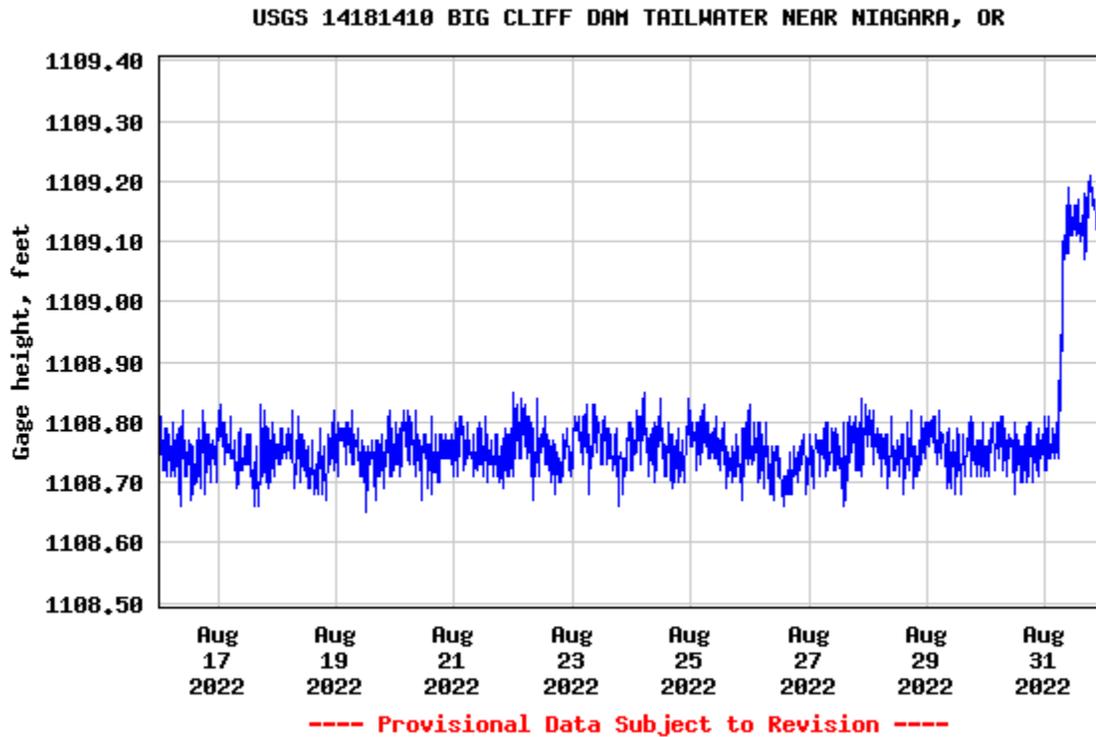
Total dissolved gas saturation ranged from 103 to 110% during the reporting period (mean: 106.5%). Figure 10 shows total dissolved gas saturation.

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 1,088.13 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.

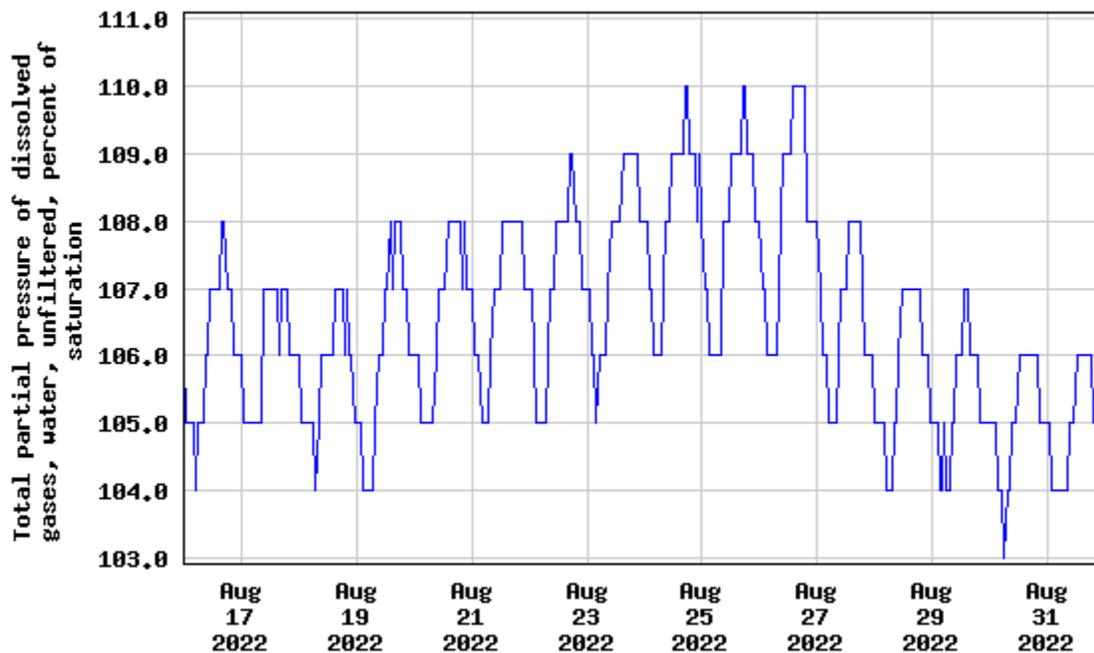
**Table 7. Summary of salmonid CPUE, Big Cliff Dam.**

	Chinook	Winter Steelhead
Description	(8 ft)	(8 ft)
Catch	7	6
Effort (hrs)	383.67	383.67
CPUE (fish/hr)	0.018	0.016



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

USGS 14181500 NORTH SANTIAM RIVER AT NIAGARA, OR



----- Provisional Data Subject to Revision -----

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

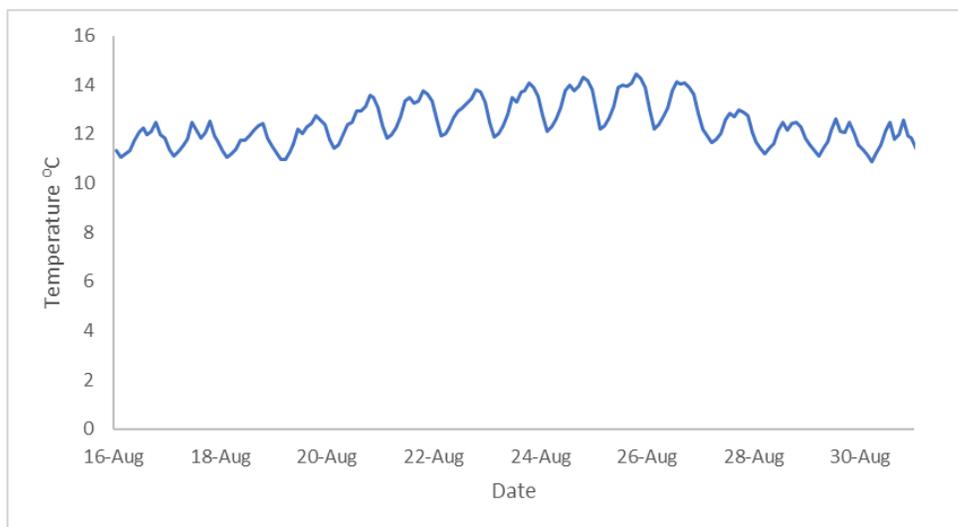
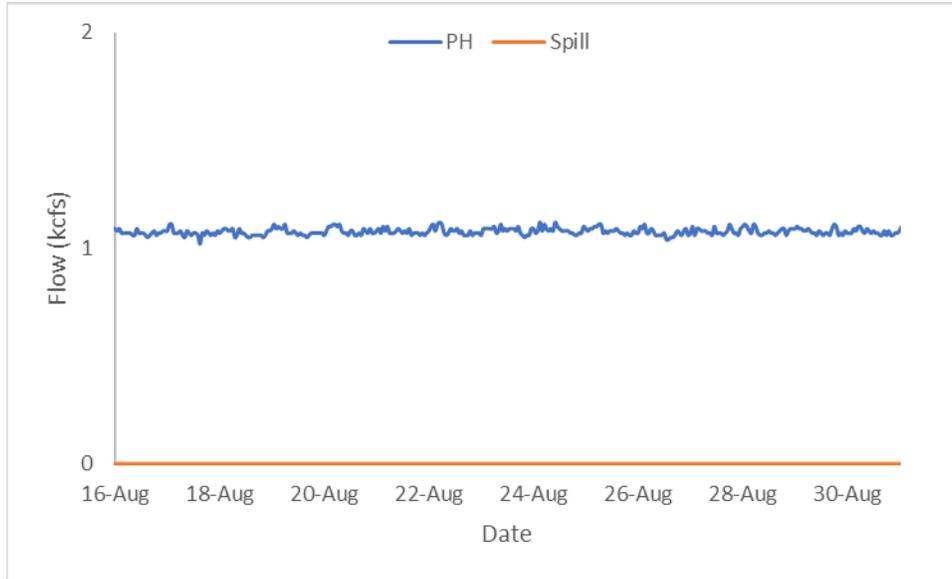


Figure 11. Temperature at RST (Big Cliff Dam)

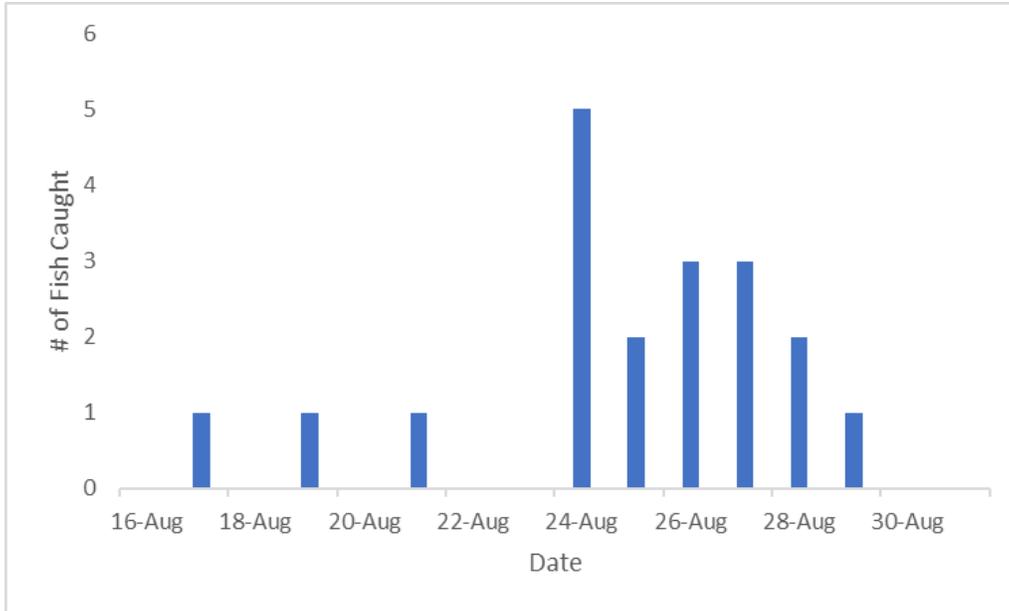


**Figure 12. Hourly Flows PWR vs. Spill (Big Cliff Dam)**

## **South Fork McKenzie – Cougar Dam**

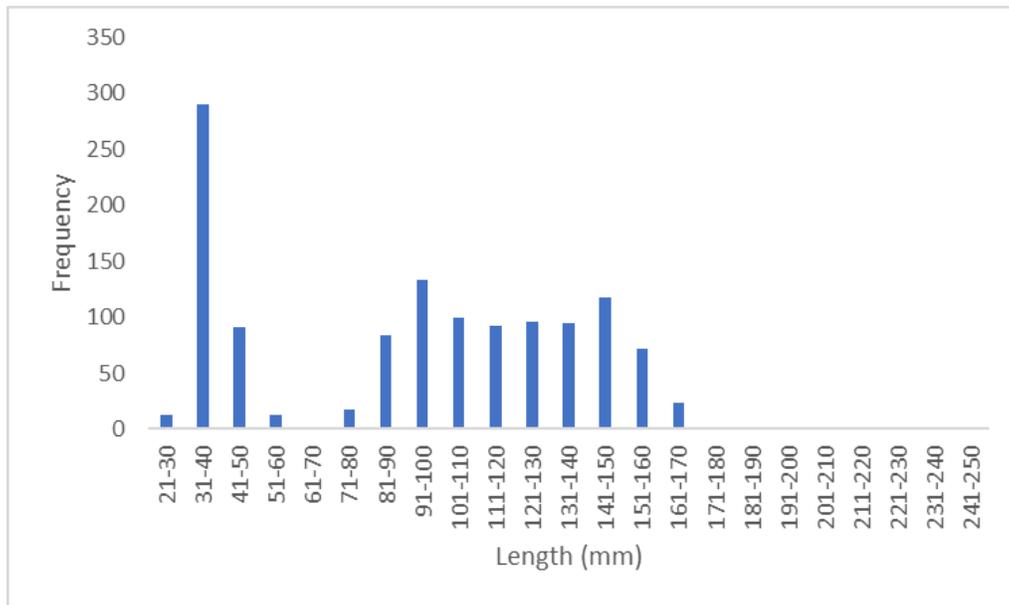
### **Target Species**

This reporting period began on August 16 and ended on August 31. There was a total of 19 Chinook Salmon (CHS) captured during the 15-day sampling period (Figure 13). The Powerhouse RSTs were raised to a non-sampling position on August 30<sup>th</sup> due low flow. The cones were lowered and fishing again on August 31<sup>st</sup>. Sampling duration was 100% for the RO RST and 93.3% for the Powerhouse 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 08/16/2022 to 08/31/2022 (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 501 juvenile hatchery Chinook (sub-yearlings) were bismarck brown dyed, adipose clipped, left vent clipped and released on 8/11/2022. 31 fish were recaptured for an efficiency of 6.2%. Trapping efficiency fish displayed injuries, primarily descaling and fin damage.

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

**Table 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	382	25	55	38.0	1.0	1.8	1.2
		CHS	Parr	259	54	165	99.5	1.6	41.0	10.7
		CHS	Smolt	224	76	167	131.1	4.2	45.6	24.2

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

August 16-31, 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	3	75	96	85.7	3.6	8.4	6.6
		CHS	Smolt	16	90	153	127.2	8.5	38.2	26.7

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

### 24-Hour Post Collection Holding Trial

A total of 9 Chinook captured in the RSTs, 9 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 (11.1%) held during this period died during holding. 1 of the 9 PWR RST captured fish (11.1%) 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 12 of the 19 Chinook collected at the PWR RST (63.2%). Descaling >20% was observed on 6 of the Chinook (31.6%). There were 12 fish with bodily injuries (63.2%) and 1 had eye injuries (5.3%). 12 fish had copepods present in the branchial cavity (63.2%) and 9 had copepods present on fins (47.4%). No fish displayed Gas Bubble Disease (0.0%). There were 10 chinook mortalities collected in the PWR RST (52.6%). 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	19	12	6	12	1	12	9	10

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

## Non-Target Species

A total of 130 non-target species fish were captured during the reporting period; the data is summarized below in Table 18. Adipose clipped Chinook captured were from previous TE releases. They are not ODFW PIT tagged fish.

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

Species	RO Capture	RO Mortality	PWR Capture	PWR Mortality	Season Total Capture	Season Total Mortality
Brook Lamprey	0	0	0	0	3	0
Bull Trout	0	0	0	0	1	0
Chinook (AD clipped)	0	0	0	0	2	0
Cutthroat	0	0	4	0	70	3
Dace	0	0	102	0	2424	8
Largescale Sucker	0	0	0	0	1	0
Mountain Whitefish	0	0	0	0	44	0
Northern Pikeminnow	0	0	1	0	2	0
<i>O. mykiss</i>	0	0	4	0	297	3
Sculpin	3	0	15	0	190	2
Smallmouth Bass	0	0	0	0	2	0
Spotted Bass	0	0	1	0	2	0
Unknown	0	0	0	0	20	1
<b>Totals</b>	<b>3</b>	<b>0</b>	<b>127</b>	<b>0</b>	<b>3108</b>	<b>17</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 1,108.7 feet to 1,253.5 feet (mean: 1,181.0 feet). Figure 15 shows instantaneous gage height.

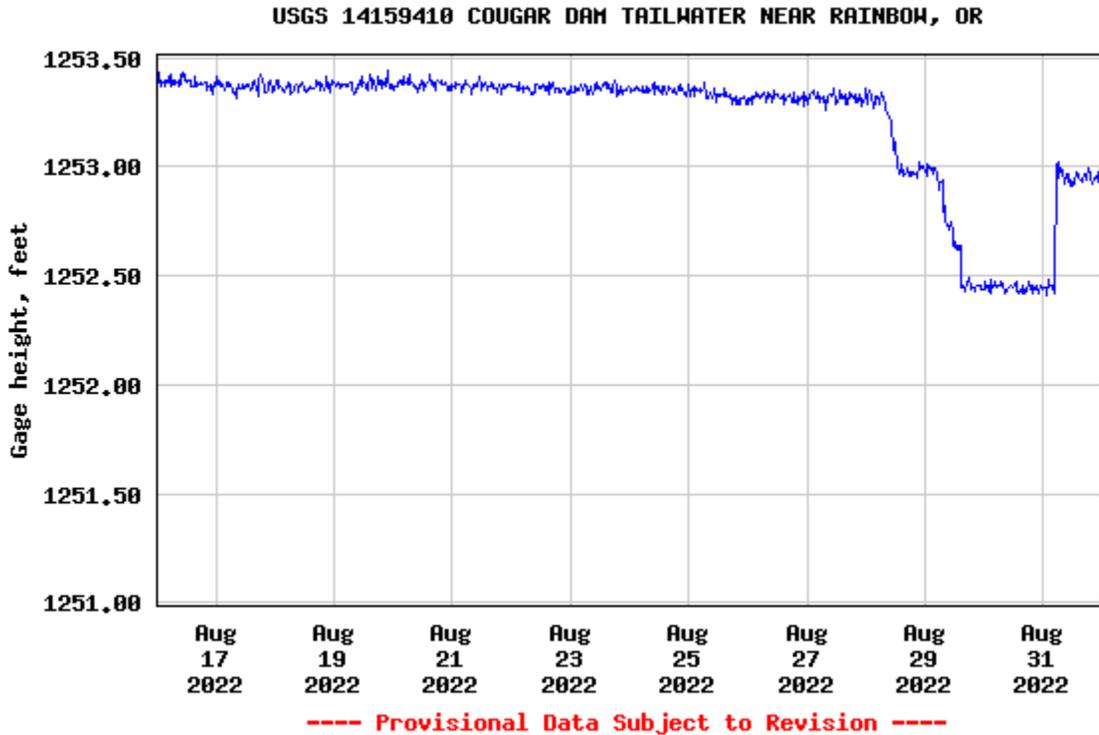
Total dissolved gas saturation ranged from 102 to 106% (mean: 103.4%). Figure 16 shows total dissolved gas saturation.

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.

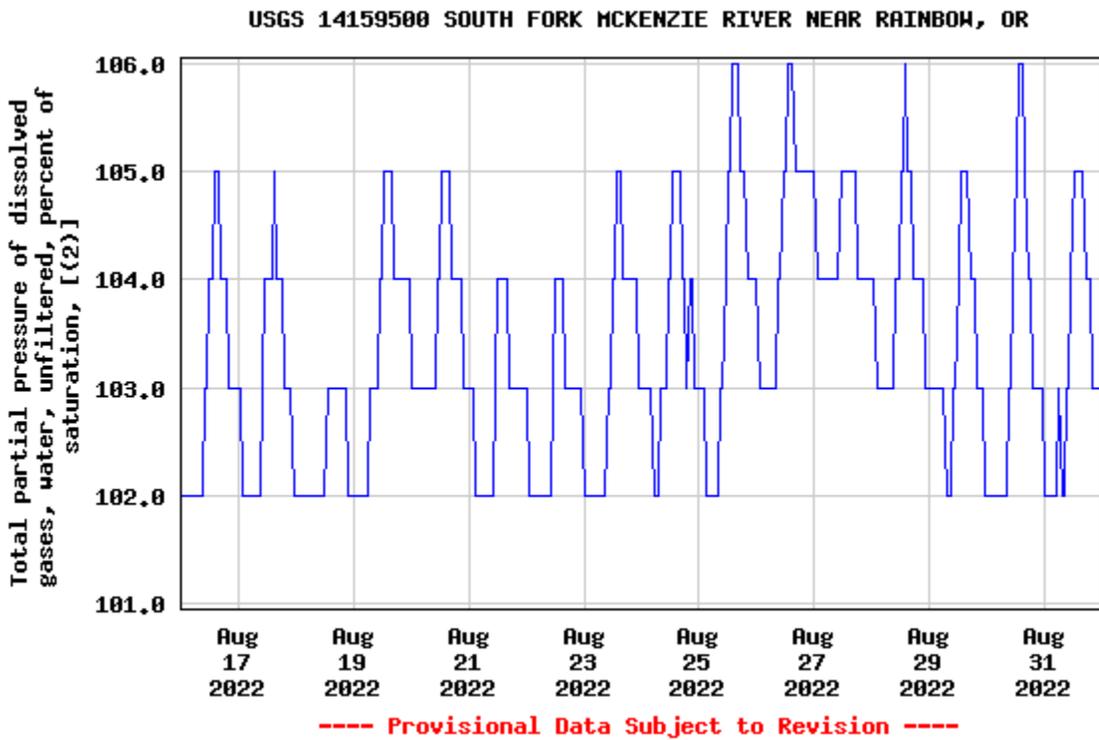
Flows through the Powerhouse and RO during the reporting period averaged 644.04 and 0 cubic feet per second (cfs) respectively (Figure 19). Catch per unit of effort (CPUE) data are summarized in Table 19. Discharge and capture data for the duration of monitoring efforts at this location are provided in Appendix B.

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

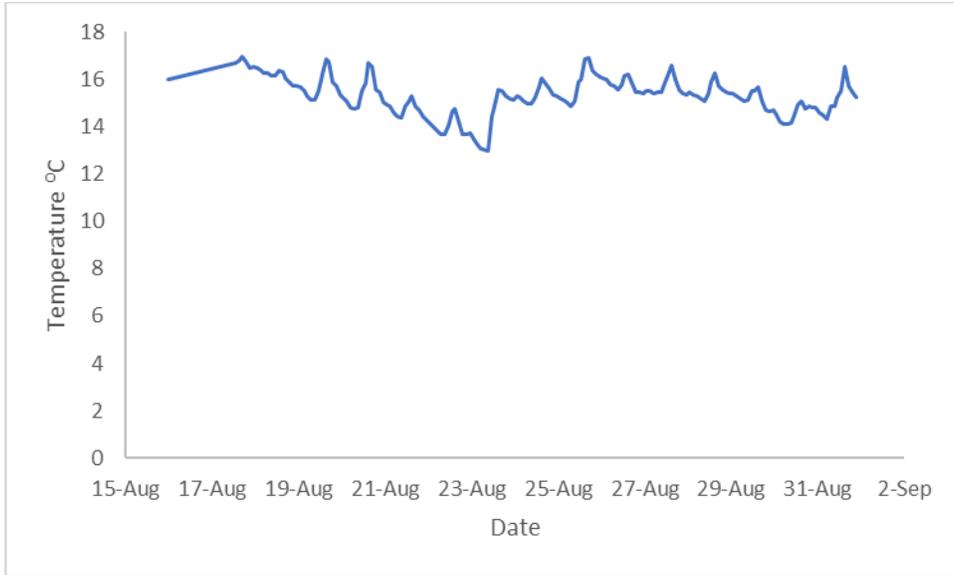
Description	Chinook	
	RO (5ft)	PWR (8ft)
Catch	0	19
Effort (hrs)	383.3	721.3
CPUE (fish/hr)	0	0.026



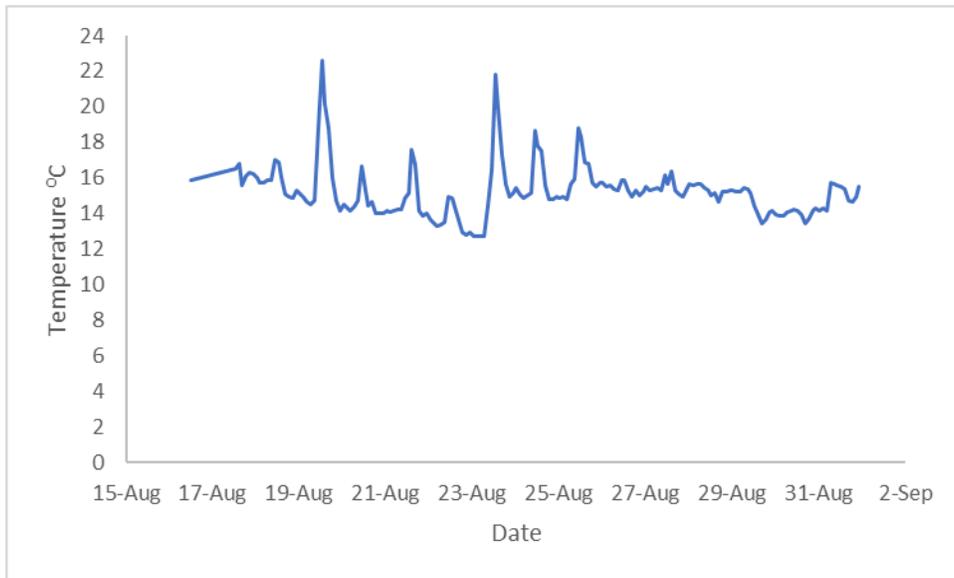
**Figure 15. Gage Height (feet); below Cougar Dam, South Fork McKenzie River**



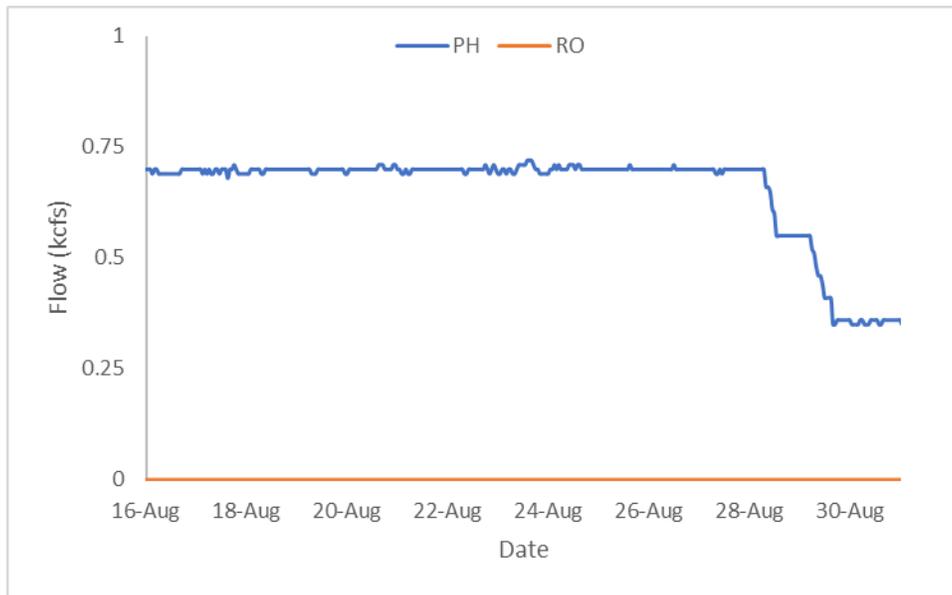
**Figure 16. Total Dissolved Gas Saturation (%); below Cougar Dam, South Fork McKenzie River**



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



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

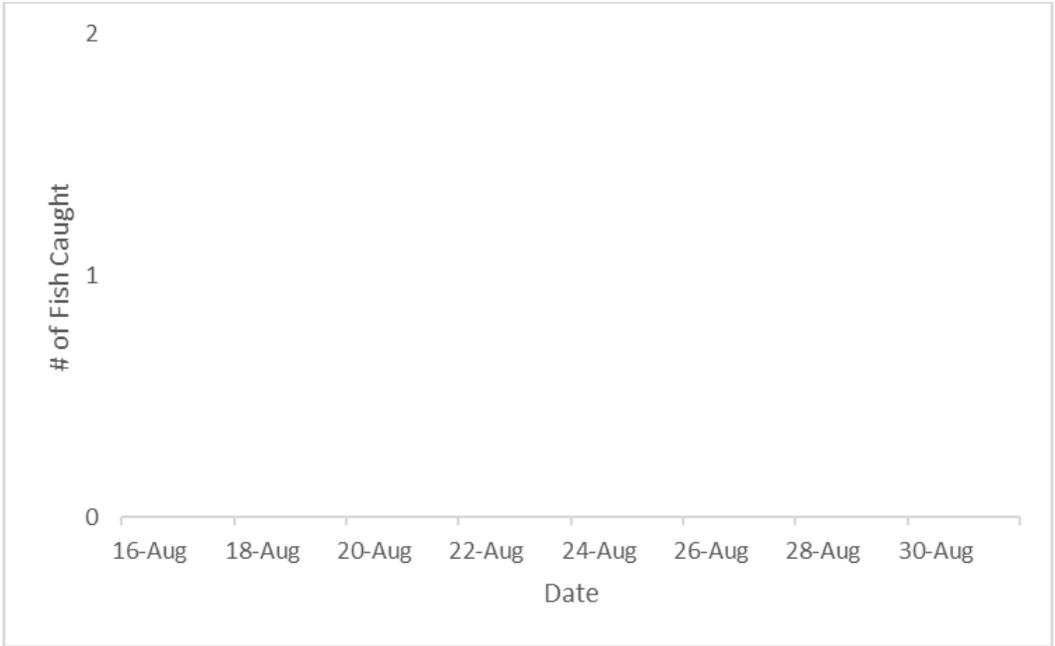


**Figure 19. Hourly Flows PWR vs. RO (Cougar Dam)**

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

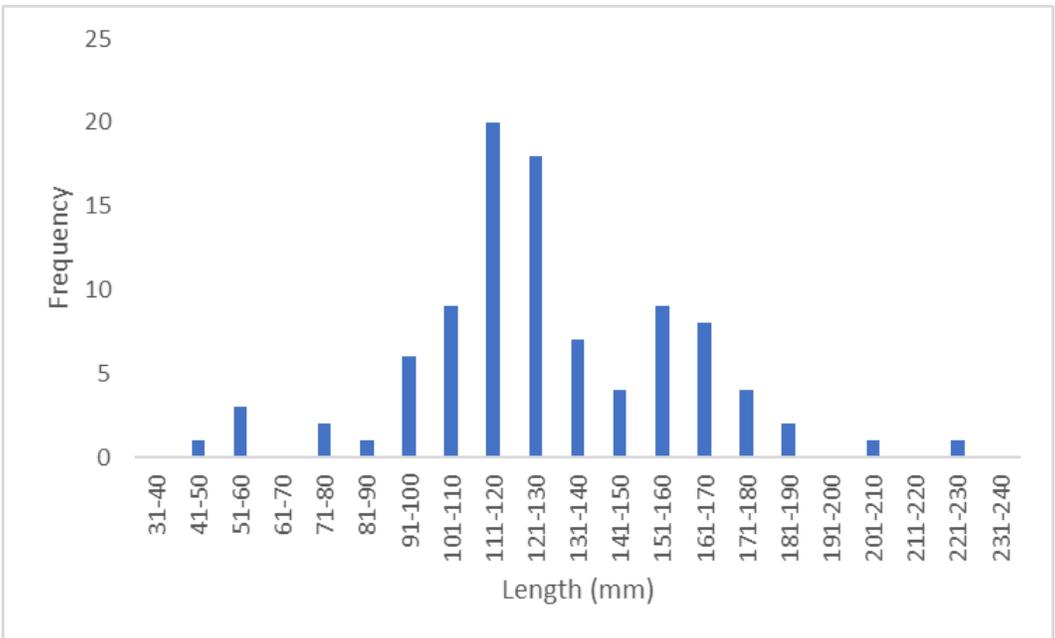
### **Target Species**

This reporting period began on August 16 and ended on August 31. There were 0 Chinook salmon (CHS) captured during the 15-day sampling period (Figure 20). Sampling duration was 100% for the 5 ft RST. Table 20 provides life stage, length, and weight data for all Chinook salmon that have been caught at the Dexter Dam site to-date and for the reporting period. Figure 20 shows the daily capture numbers for Chinook and Figure 21 shows length frequency data to-date.



\*Recaptured fish for trapping efficiency trials not included.

**Figure 20. Chinook Captured Per Day 08/16/2022 to 08/31/2022 (Dexter Dam)**



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

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

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

To-Date (Since March 07, 2022)										
Site	Trap	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Dexter Dam	5 ft	CHS	Fry	3	46	55	51.3	1.4	1.4	1.4
		CHS	Parr	17	51	159	101.8	2.1	48.3	13.2
		CHS	Smolt	76	95	224	137.3	9.3	118.4	27.6

August 16-31, 2022										
Site	Trap	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Dexter Dam 5 ft		CHS	Fry	0	N/A	N/A	N/A	N/A	N/A	N/A
		CHS	Parr	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

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

### Trapping Efficiency

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

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

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

### 24-Hour Post Collection Holding Trial

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

### Injuries and Copepod Infection

0 Chinook was captured during this reporting period. Partial descaling <20% was observed in 0 of the 0 Chinook captured (0.0%) and 0 displayed descaling >20% (0.0%). 0 displayed body injury (0.0%) and 0 Chinook had eye injury (0.0%). 0 Chinook had copepods present in the branchial cavity (0.0%) and 0 had

copepods on fins (0.0%). 0 displayed gas bubble disease (0.0%). There were 0 mortalities this reporting period (0.0%). Injuries are displayed in Table 21. To date injury data can be found in Appendix A.

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

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

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

### Non-Target Species

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

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

Species	Capture	Mortality	Season Total	Season Total Mortality
Bass	20	0	73	1
Bluegill	1	0	3	1
Chinook (clipped)	1	0	356	7
Crappie	11	0	24	5
Cutthroat	0	0	3	0
Dace	0	0	31	6
<i>O. mykiss</i>	0	0	13	0
<i>O. mykiss</i> (clipped)	2	0	33	1
Red-Sided Shiner	2	0	3	0
Sculpin	71	1	295	14
Sucker	0	0	2	0
Unknown	1	0	1	0
<b>Totals</b>	<b>109</b>	<b>1</b>	<b>642</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 637.7 feet to 638.4 feet (mean: 637.9 feet). Figure 22 shows instantaneous gage height.

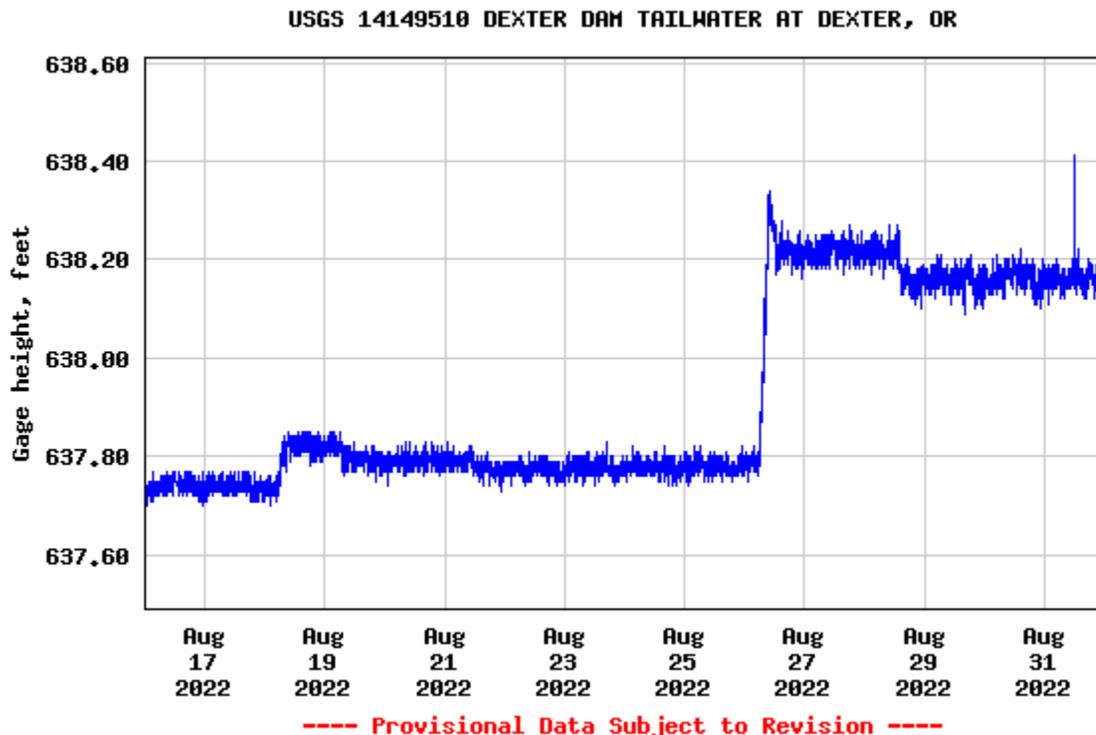
Total dissolved gas saturation ranged from 99 to 105% (mean: 101.2%) during the reporting period. Figure 23 shows total dissolved gas saturation.

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 24.

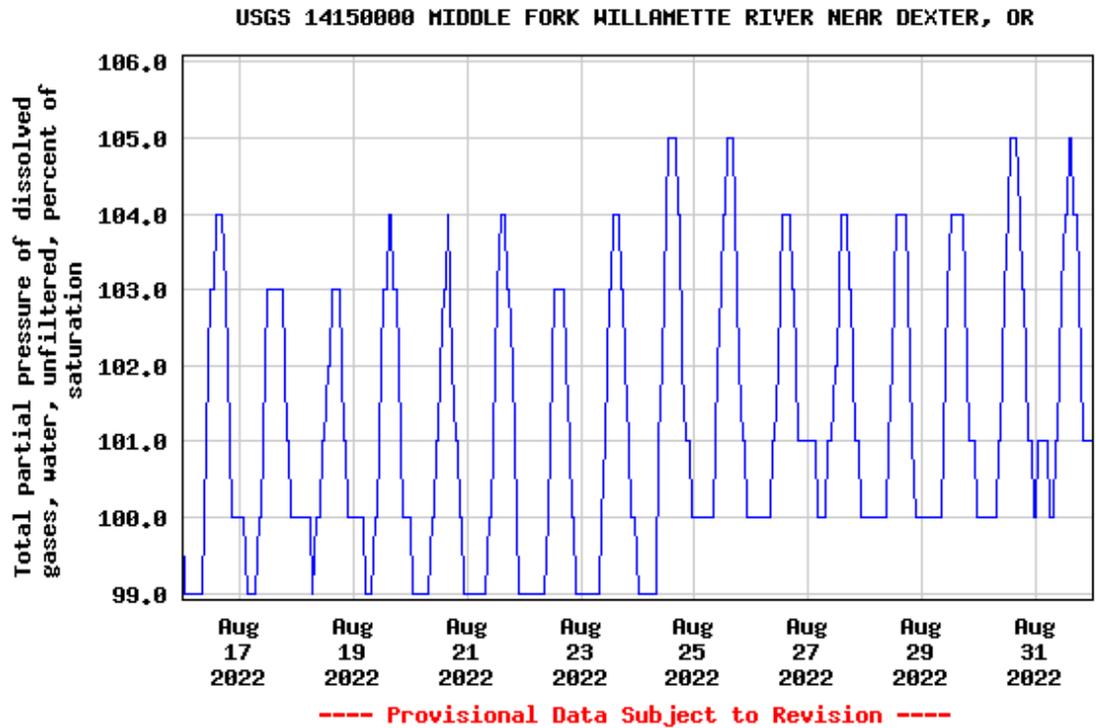
Flows through the Powerhouse and Spill during the reporting period averaged 2,207.63 and 0 cubic feet per second (cfs) respectively (Figure 25). Catch per unit of effort (CPUE) data are summarized in Table 23. Discharge and capture data for the duration of monitoring efforts at this location are provided in Appendix B.

**Table 23. Summary of salmonid CPUE, Dexter Dam.**

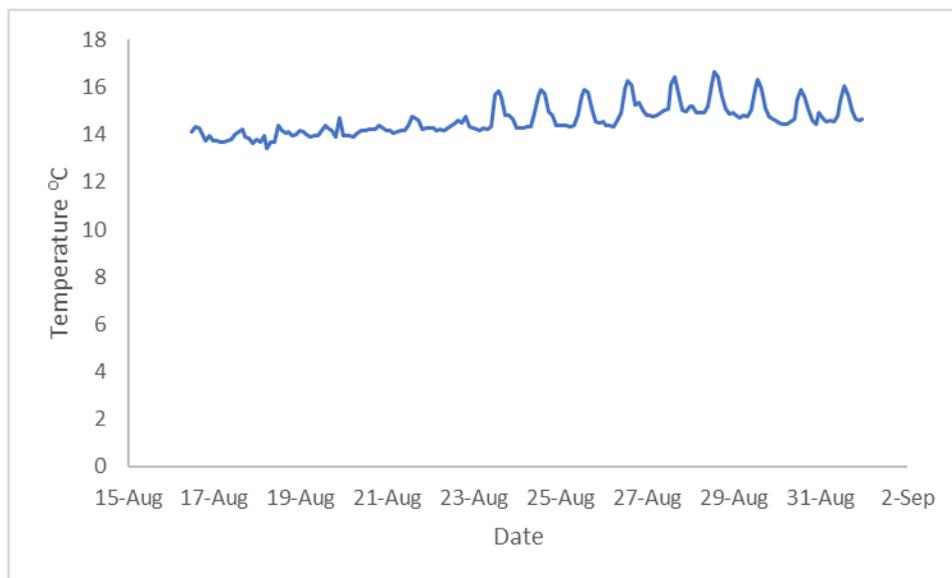
	Chinook
Description	8 ft
Catch	0
Effort (hrs)	384.5
CPUE (fish/hr)	0



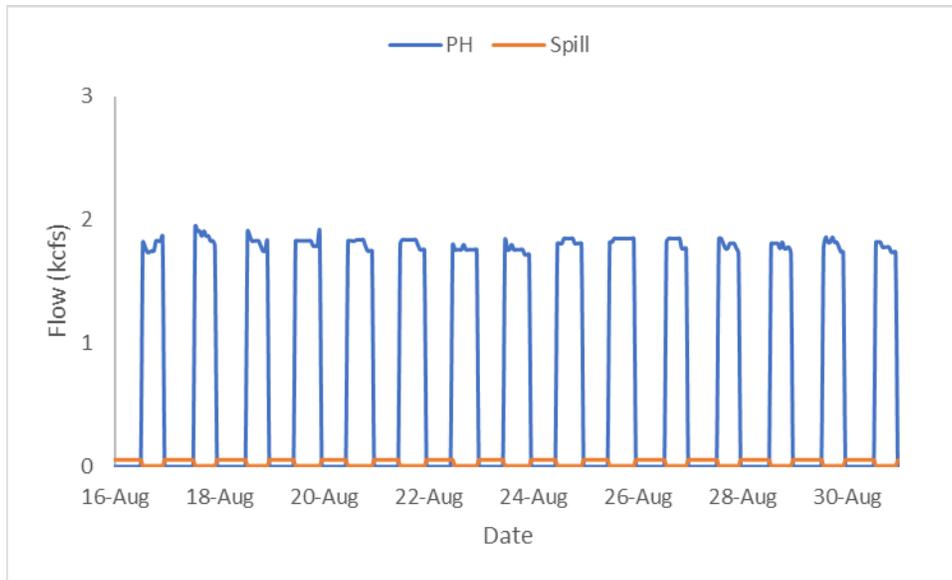
**Figure 22. Gage Height (feet); below Dexter Dam, Middle Fork Willamette**



**Figure 23. Total Dissolved Gas Saturation (%); Middle Fork Willamette River, Near Dexter, OR**



**Figure 24. Temperature at RST (Dexter Dam)**

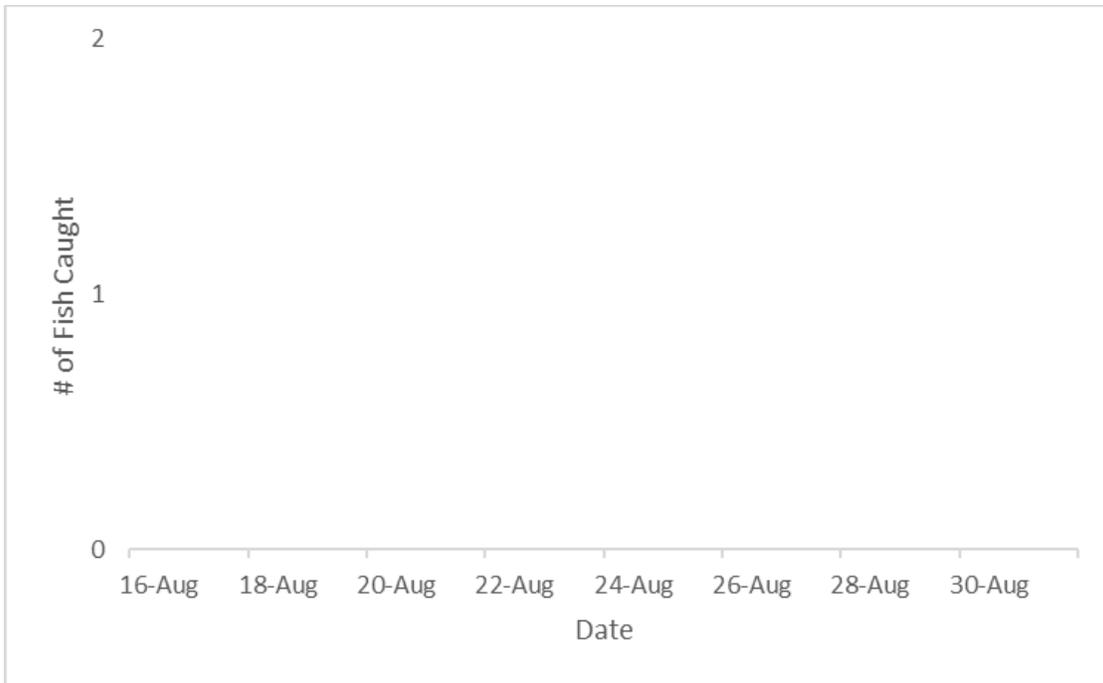


**Figure 25. Hourly Flows PWR vs. Spill (Dexter Dam)**

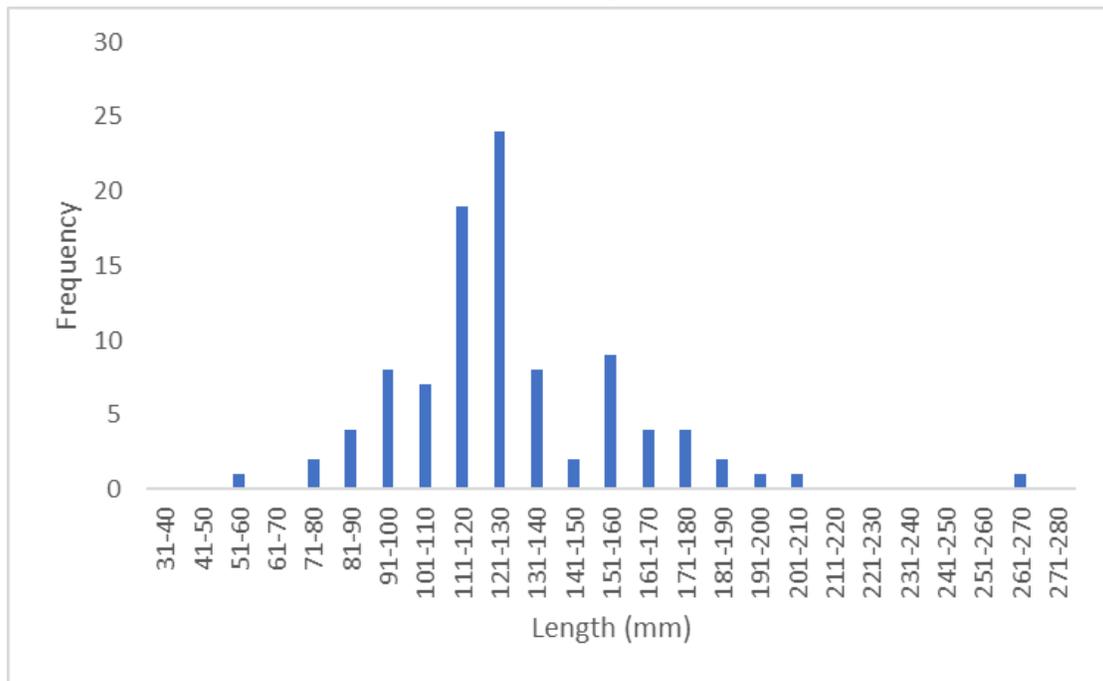
## **Middle Fork Willamette – Lookout Dam Tailrace**

### **Target Species**

The reporting period began August 16 and ended August 31. 0 Chinook salmon were captured during the 15-day sampling period (Figure 26). The traps were operated 100.0% of the reporting period. Table 24 provides life stage, length, and weight data for all Chinook salmon that have been caught at the Lookout Point Dam Tailrace site to-date and Figure 27 shows length frequency data to-date.



**Figure 26. Chinook Captured Per Day 08/16/2022 to 08/31/2022 (Lookout Point Dam Tailrace)**



**Figure 27. Length Frequency of Juvenile Chinook Sampled Season To-Date (Lookout Point Dam Tailrace)**

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

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

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

### 24-Hour Post Collection Holding Trial

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

### Trapping Efficiency

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

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

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

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

### Injuries and Copepod Infection

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

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

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

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

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

### Non-Target Species

1051 non-target species were captured during the reporting period; the data is summarized below in Table 26.

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

Species	PWR Capture	PWR Mortality	Spill Capture	Spill Mortality	Season Total	Season Total Mortality
Bass Unknown	803	794	1	1	4935	3605
Bluegill	0	0	0	0	1	0
Bullhead	0	0	0	0	3	1
Chinook (clipped)	0	0	0	0	4	0
Crappie	222	94	4	0	358	168
Cutthroat	0	0	0	0	1	0
Largemouth Bass	0	0	0	0	1	0
Largescale Sucker	0	0	0	0	25	15
Northern Pikeminnow	0	0	0	0	16	9
<i>O. mykiss</i>	0	0	0	0	7	1
<i>O. mykiss</i> (clipped)	0	0	1	0	2	1
Red-Sided Shiner	0	0	0	0	1	0
Sculpin	3	0	16	1	46	2
Walleye	0	0	0	0	10	3
Unknown	1	1	0	0	2	1
<b>Totals</b>	<b>1029</b>	<b>890</b>	<b>22</b>	<b>2</b>	<b>5329</b>	<b>3821</b>

### Stream Statistics

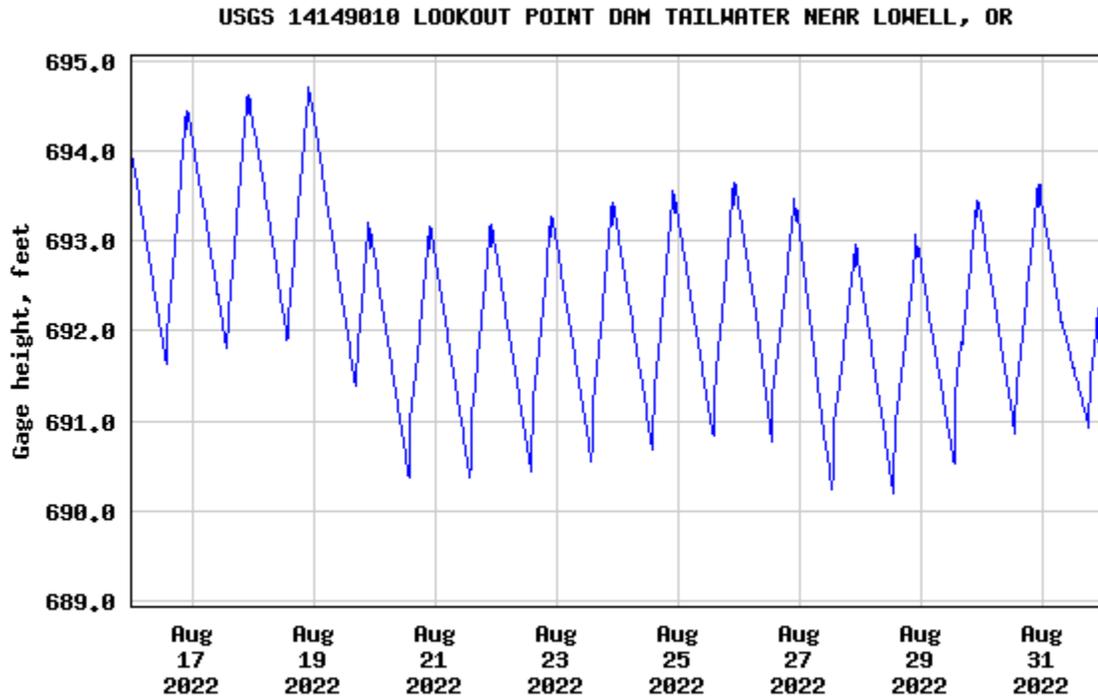
Basic stream statistics at Lookout Dam Tailrace site were calculated from data downloaded from the U.S. Geological Survey stream gage number 14149010. Total dissolved gas saturation or dissolved oxygen concentration measurements are not available at this stream gage site, or any nearby stream gages. Gage height (feet) is the only metric provided at this gage. During the reporting period, daily maximum values for instantaneous gage height ranged from 690.2 feet to 694.7 feet (mean: 692.3 feet). Figure 28 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 29 and 30).

Flows through the Powerhouse and Spill during the reporting period averaged 1,920.47 and 180.73 cubic feet per second (cfs) respectively (Figure 31). Catch per unit of effort (CPUE) data are summarized in Table 27. Discharge and capture data for the duration of monitoring efforts at this location are provided in Appendix B.

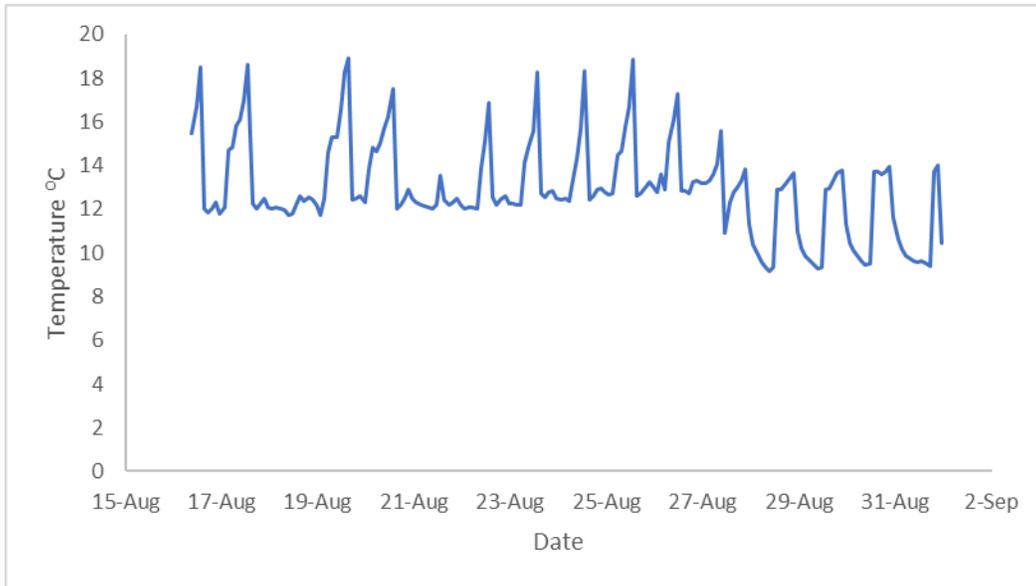
**Table 27. Summary of Chinook CPUE at Lookout Point Dam Tailrace.**

Description	Chinook		
	PH 1	PH 2	Spill
Catch	0	0	0
Effort (hrs)	382.3	382.8	383.0
CPUE (fish/hr)	0	0	0

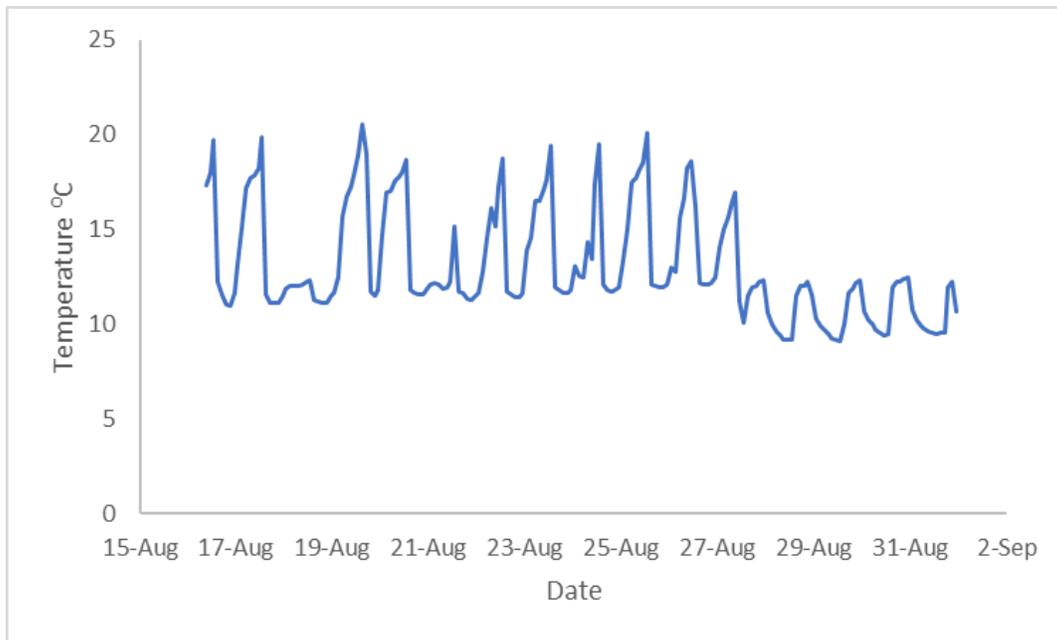


---- Provisional Data Subject to Revision ----

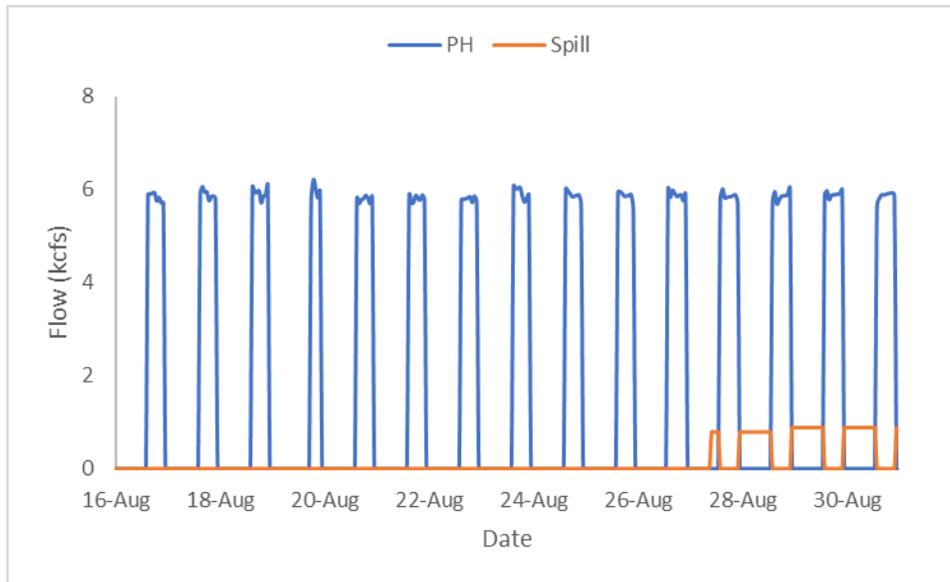
**Figure 28. Gage Height (feet); below Lookout Dam**



**Figure 29. Temperature at RST (Lookout Dam PWR)**



**Figure 30. Temperature at RST (Lookout Dam Spill)**

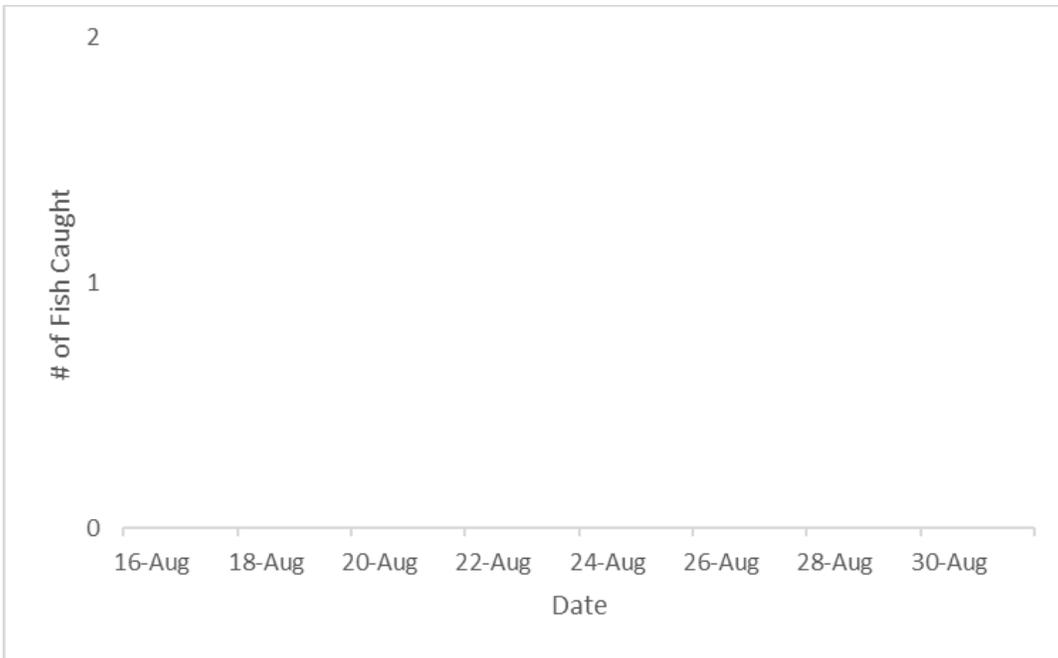


**Figure 31. Hourly Flows PWR vs. Spill (Lookout Dam Tailrace)**

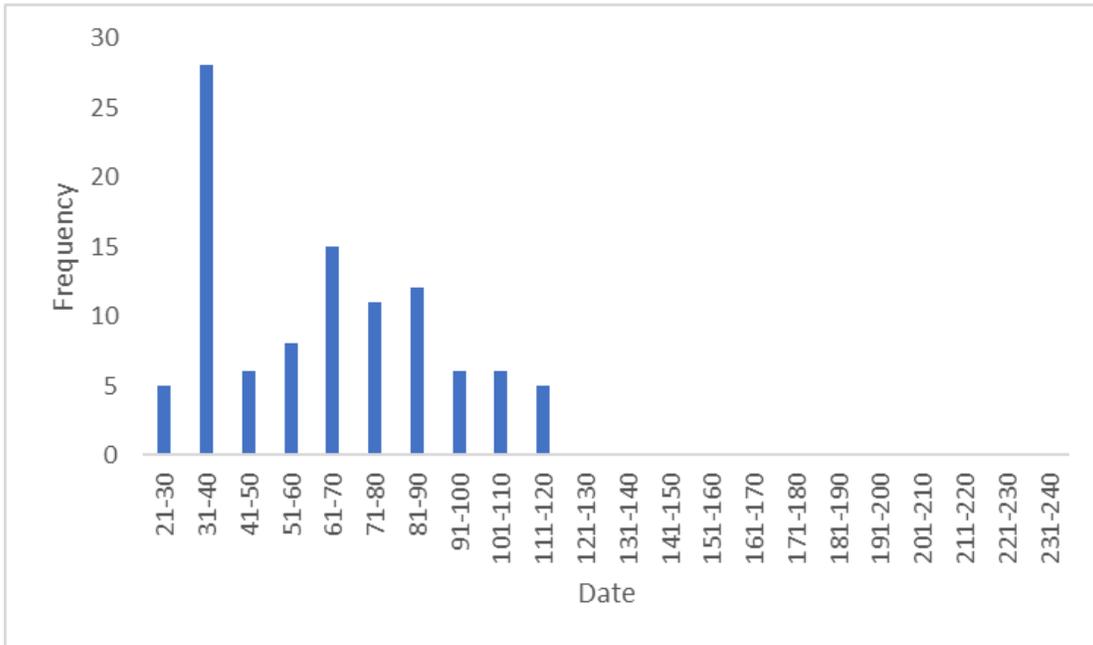
## **Middle Fork Willamette – Lookout Point Head of Reservoir**

### **Target Species**

The reporting period began August 16 and ended August 31. 0 Chinook salmon was captured during the 15-day sampling period (Figure 32). The trap was operated 100% of the reporting period. Table 28 provides life stage, length, and weight data for all Chinook salmon that have been caught at the Middle Fork Willamette - Lookout Point Head of Reservoir site to-date and Figure 33 shows length frequency data to-date.



**Figure 32. Chinook Captured Per Day 08/16/2022 to 08/31/2022 (Lookout Point Head of Reservoir)**



**Figure 38. Length Frequency of Juvenile Chinook Sampled Season To-Date (Lookout Point Head of Reservoir)**

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

To-Date										
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Lookout Point Head of Reservoir	5 ft	CHS	Smolt	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	41	28	69	37.2	N/A	N/A	N/A
August 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	N/A	N/A	N/A	N/A	N/A	N/A
		CHS	Parr	0	N/A	N/A	N/A	N/A	N/A	N/A
		CHS	Fry	0	N/A	N/A	N/A	N/A	N/A	N/A

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

### Trapping Efficiency

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

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

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

### Injuries and Copepod Infection

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

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

Site	# CHS Collected	# DSC* <20%	# DSC* >20%	# with Body Injuries	# with Eye Injuries	# with COP* In B.C.	# with COP* on Fins	Mortalities
Lookout Point Head of Reservoir	0	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 the dorsal fin with fluorescent yellow elastomer. 1 fish has been VIE marked to the left of the dorsal fin with fluorescent red elastomer. No fish with VIE marks have been detected at downstream RST sites to date.

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

### Non-Target Species

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

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

<b>Species</b>	<b>5ft Capture</b>	<b>5ft Mortality</b>	<b>Season Total</b>	<b>Season Total Mortality</b>
Bass Unknown	0	0	2	0
Bluegill	0	0	2	0
Chinook (clipped)	0	0	26	0
Cutthroat Trout	0	0	10	0
Dace	24	0	120	0
Lamprey	0	0	2	0
Largescale Sucker	1	0	16	1
Mountain Whitefish	0	0	3	0
Northern Pikeminnow	13	0	20	0
<i>O. mykiss</i>	3	0	84	3
<i>O. mykiss</i> (clipped)	0	0	2	0
Peamouth	1	0	1	0
Red-Sided Shiner	0	0	2	0
Sculpin	4	4	20	7
Smallmouth Bass	0	0	7	0
Unknown	0	0	10	0
<b>Totals</b>	<b>46</b>	<b>4</b>	<b>324</b>	<b>11</b>

### **Stream Statistics**

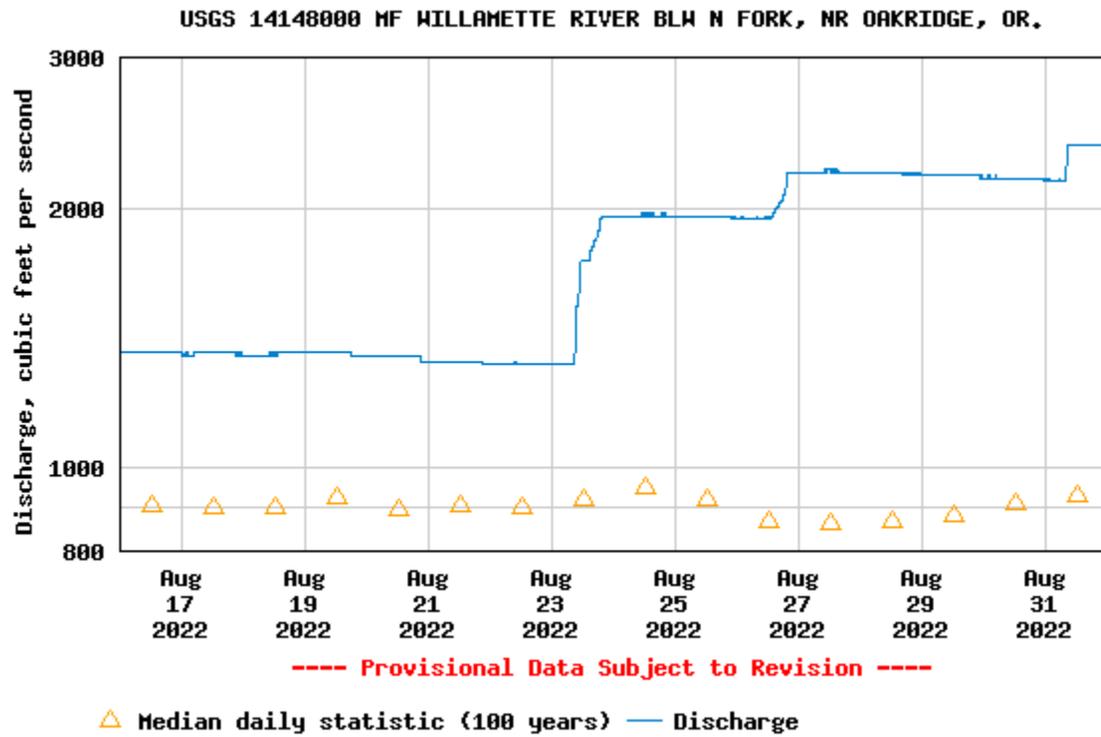
Basic stream statistics for the Lookout Point Head of Reservoir RST site were calculated from data downloaded from the U.S. Geological Survey stream gage number 14148000. During the reporting period, daily maximum values for instantaneous discharge ranged from 913 cfs to 2380.0 cfs (mean: 1324.5 cfs). Figure 34 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 35).

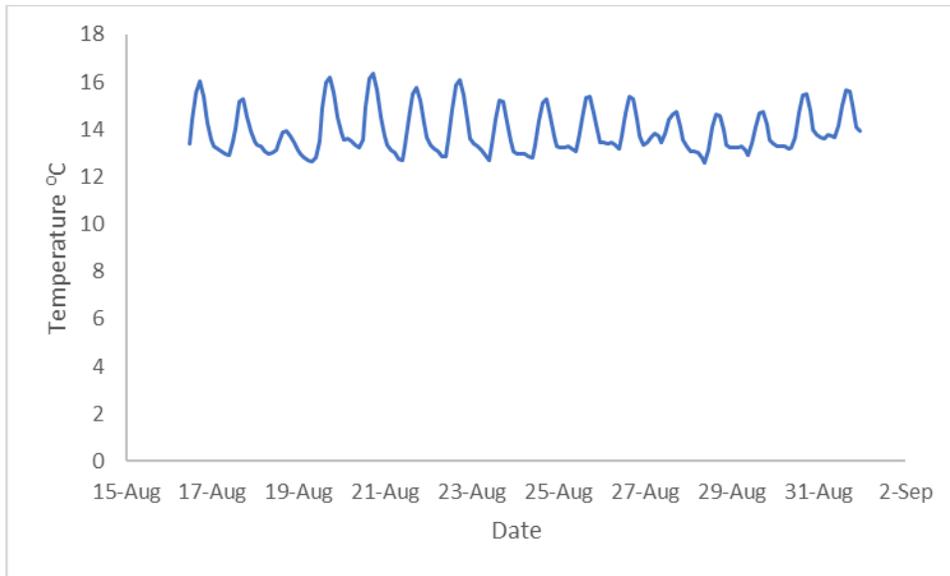
Flows into Lookout Point Reservoir averaged 1,665.51 cfs (Figure 36). Catch per unit of effort (CPUE) data are summarized in Table 31. Discharge and capture data for the duration of monitoring efforts at this location are provided in Appendix B.

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

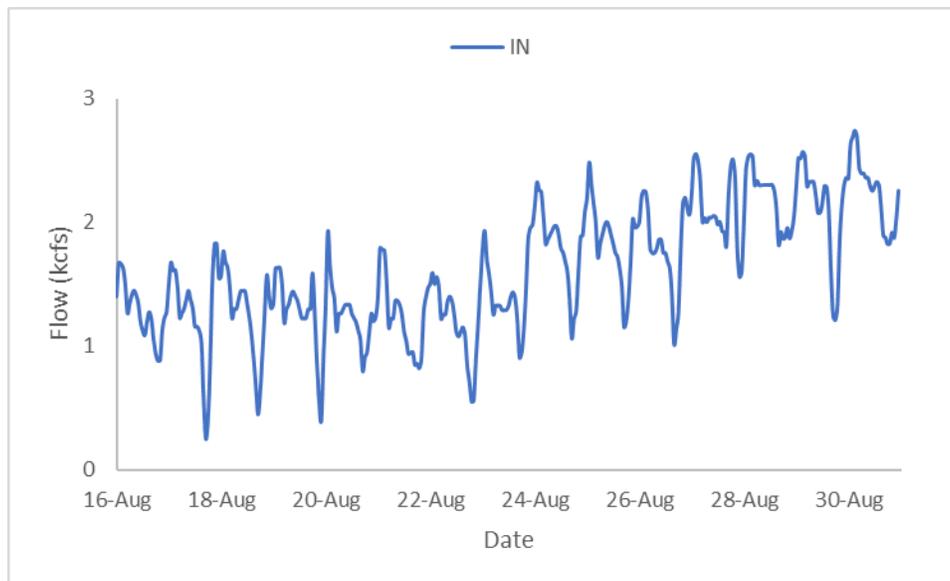
	Chinook
<b>Description</b>	<b>5 ft</b>
Catch	0
Effort (hrs)	382.7
CPUE (fish/hr)	0



**Figure 34. Discharge (cfs); above Lookout Point Reservoir, Below Oakridge, OR**



**Figure 35. Temperature at RST (Lookout Point Head of Reservoir)**



**Figure 36. Hourly Flows (Lookout Point Head of Reservoir site)**

### Issues Encountered

The Cougar Powerhouse RSTs were raised to a non-sampling position on August 30<sup>th</sup> due to low flow as ODFW was installing an antenna in the Powerhouse Channel. The RSTs resumed fishing on August 31<sup>st</sup>.

### Upcoming USACE Support Services

Crane support has been requested on September 14<sup>th</sup> to assist with trap installation at Hills Creek Dam Tailrace.

## 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	1047		639	4	74	3	1	791	240	3	517	5	10	3	23	6	58	32	110	64	57	13	31
8 ft	1047		639	4	74	3	1	791	240	3	517	5	10	3	23	6	58	32	110	64	57	13	31
Parr	24		6		1	1		15	3		6					2			1				
Smolt	1012		633	4	72	2		776	236	3	510	5	10	1	23	4	57	32	108	63	57	12	31
Unknown	2													2								1	
Fry	9				1		1		1		1						1		1	1			
Cougar Dam	1248	10	499	5	83	5	3	510	143	3	282	2	4	2	18	4	33	30	71	42	28	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	862	10	284	3	23	3		254	63		128		4	2	12		14	20	27	16	18	4	3
Parr	258		142		11	1		100	24		65		1		5		3	5	11	6	5		
Smolt	220		140	3	8	2		154	33		58		3		6		9	8	13	7	13	1	3
Unknown	2													2									
Fry	382	10	2		4				6		5				1		2	7	3	3			3
Dexter Dam Tail.	96		58		6			11	23		45					1	3	4	6	6	4		20
5 ft	96		58		6			11	23		45					1	3	4	6	6	4		20
Parr	17		6		3			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	101		30					1			11						1		1				
5 ft	101		30					1			11						1		1				
Parr	59		29					1			9						1		1				
Smolt	1																						
Fry	41		1								2												

### Chinook (CHS)

Chinook Injuries During Reporting Period (8-16-2022 to 8-31-2022)																							
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	7		4					6	3		6										2		
8 ft	7		4					6	3		6										2		
Smolt	7		4					6	3		6										2		
Cougar Dam	19		12	1	2			13	6		9				2		4	4	4	2	4		
PH	14		9	1	2			9	5		6							3	2	1	3		
Parr	2		2								1							1	1				
Smolt	12		7	1	2			9	5		5							2	1	1	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	51		15		1			10	5		11		1		1		4	2	5	6			1
8 ft	51		15		1			10	5		11		1		1		4	2	5	6			1
Adult	1								1		1		1										
Parr	8		2		1						1										1		
Smolt	15		10					10	4		8				1		3	2	5	5			1
Fry	27		3								1						1						
Green Peter Tailrace -	6		3		1			1	2		4						4		1	1			5
8 ft	6		3		1			1	2		4						4		1	1			5
Smolt	6		3		1			1	2		4						4		1	1			5
Foster Dam Head of R	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																						

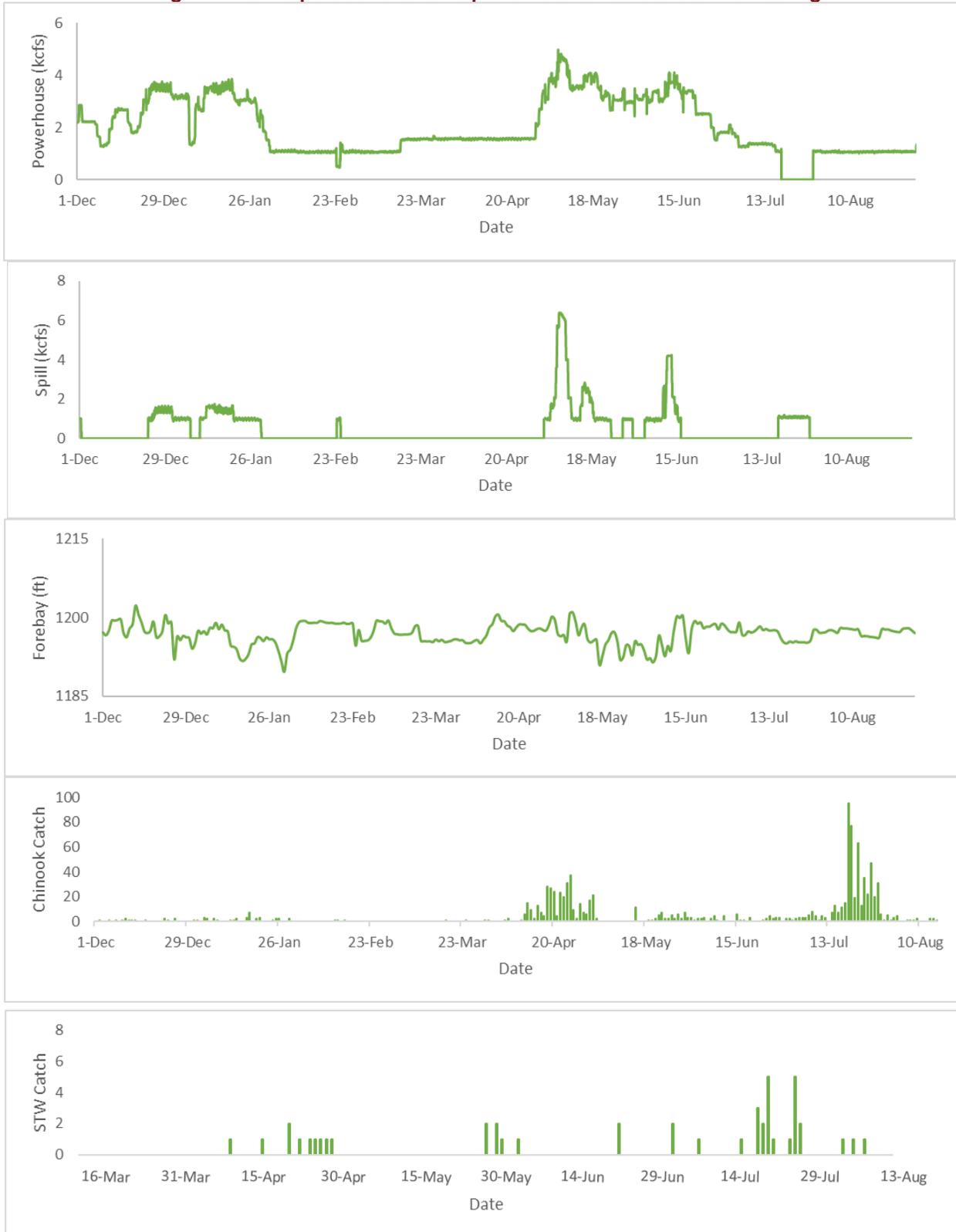
### Steelhead (O. mykiss)

O. mykiss Injuries During Reporting Period (8-16-2022 to 8-31-2022)																							
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	6		3						1		3		1				1						
8 ft	6		3						1		3		1				1						
Adult	1								1		1		1										
Parr	3		1								1												
Fry	2		2								1						1						

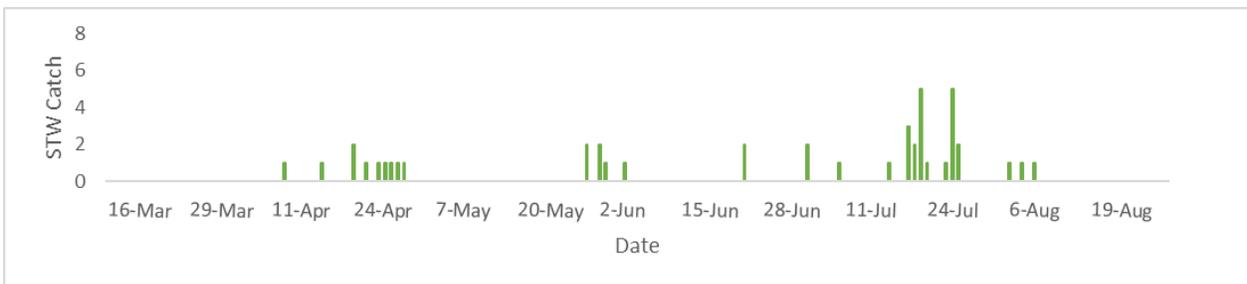
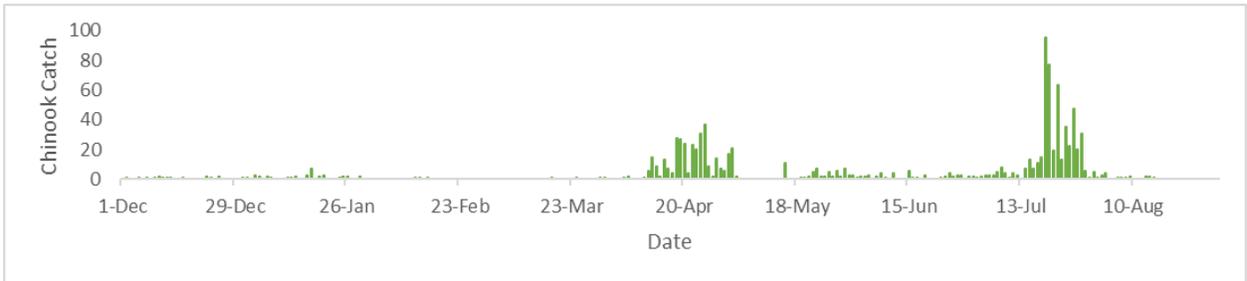
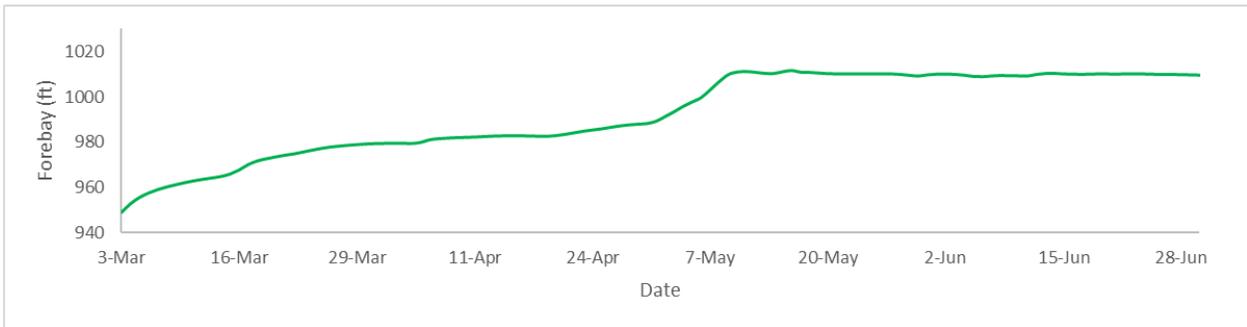
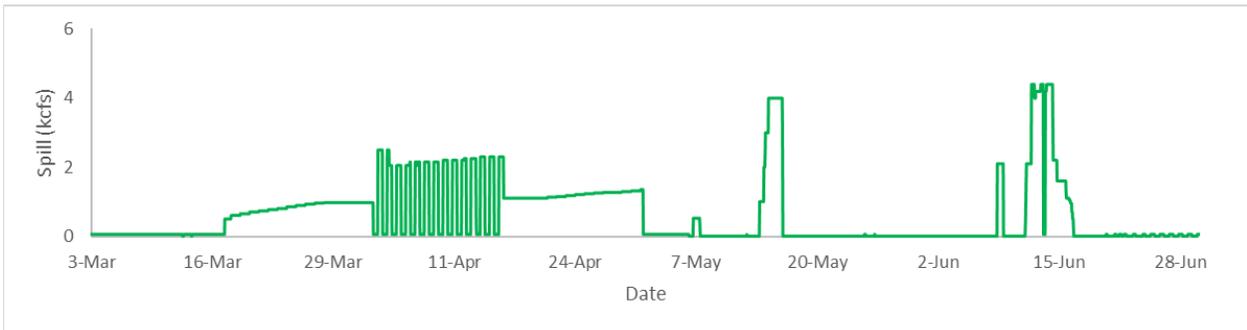
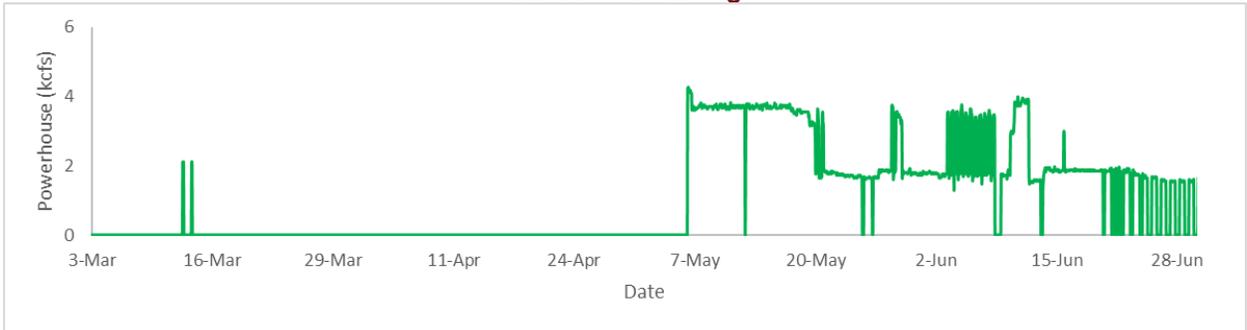
<b>Injury Code</b>	<b>Description of Injury/Condition</b>
NXI	Live fish with no external injuries
MUNK	Mortality with no external injuries
DS<2	Descaling <20%
BLO	Bloated
EYB	Bloody Eye (hemorrhage)
BVT	Bleeding from Vent
FVB	Fin Blood Vessels Broken
GBD	Gas Bubble Disease (fin ray/eye inclusions)
POP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

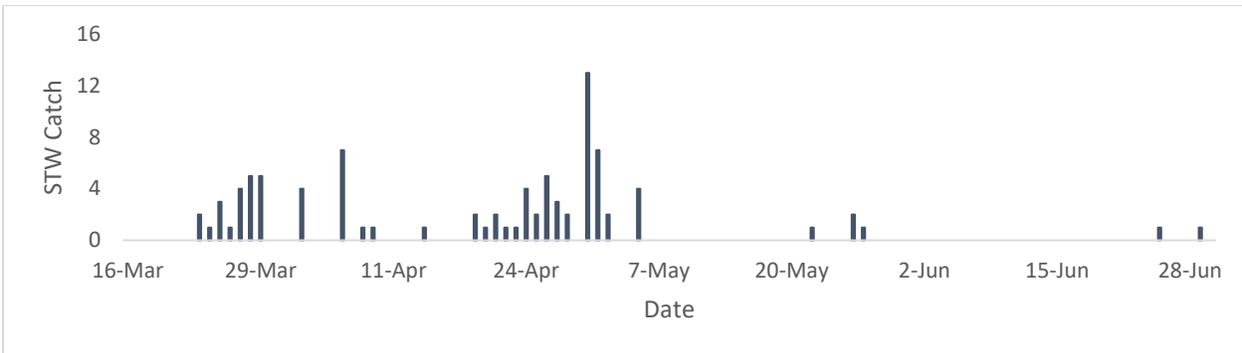
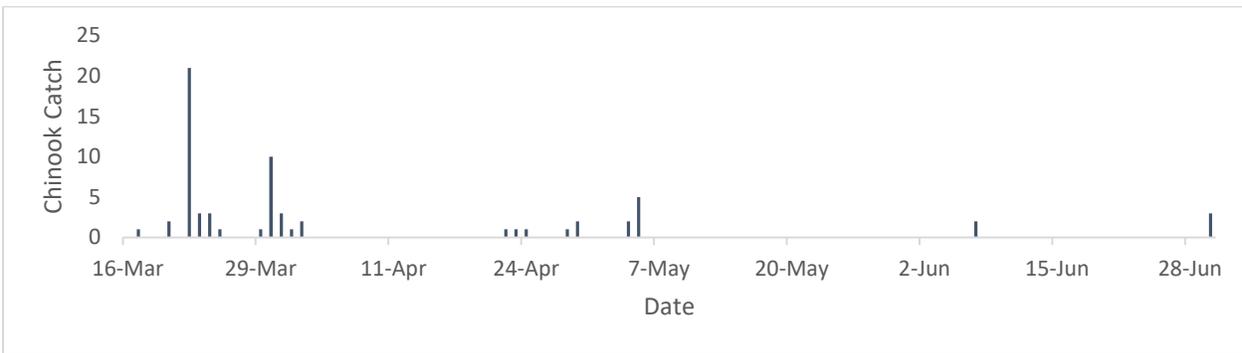
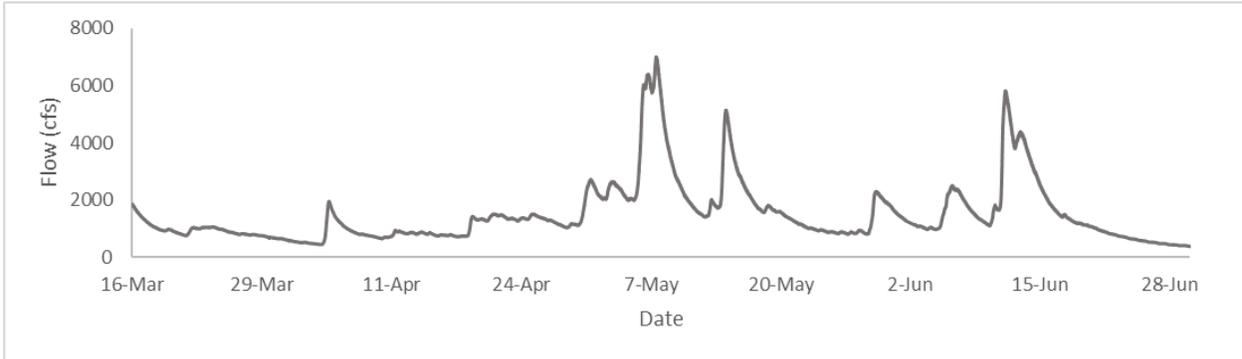
### Big Cliff Dam Operational and Capture Data Since Start of Monitoring



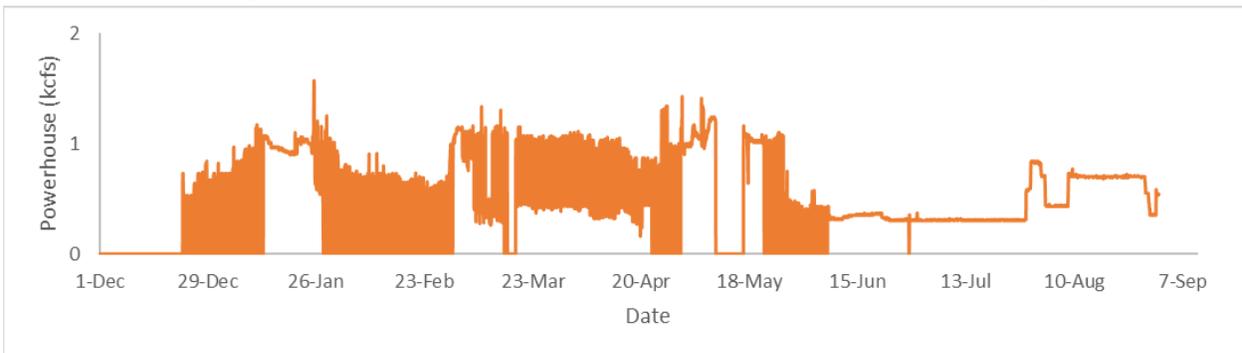
**Green Peter Dam Operational and Green Peter Tailrace- Middle Santiam River Capture Data Since Start of Monitoring**

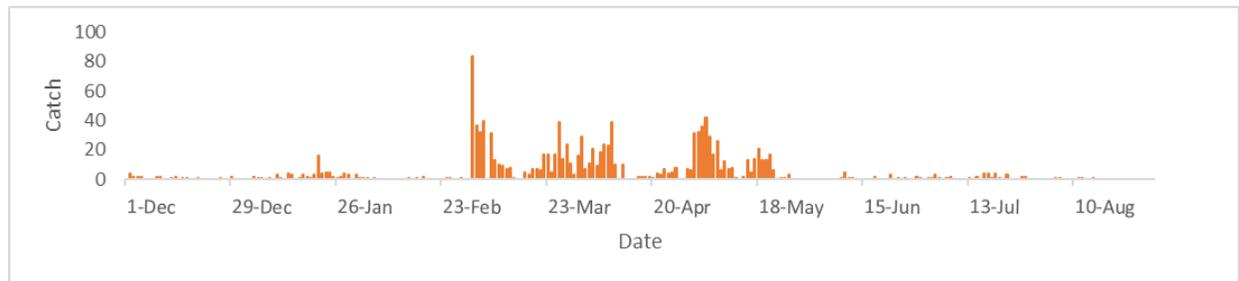
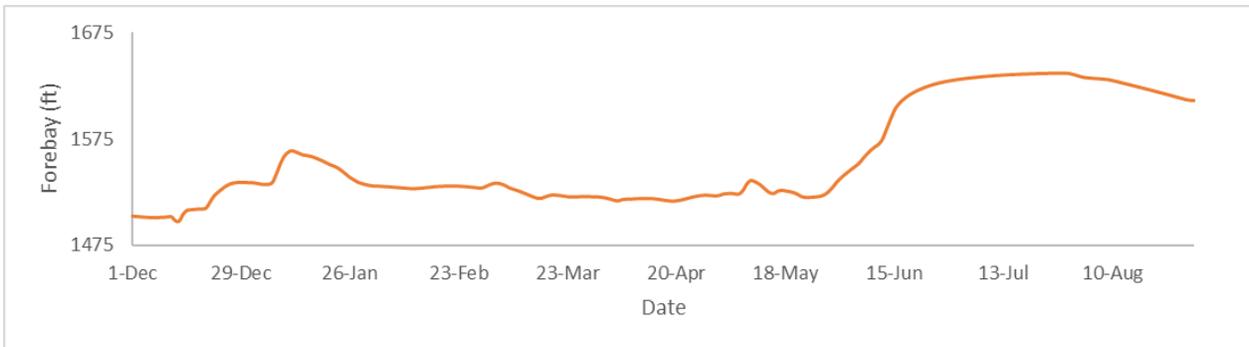
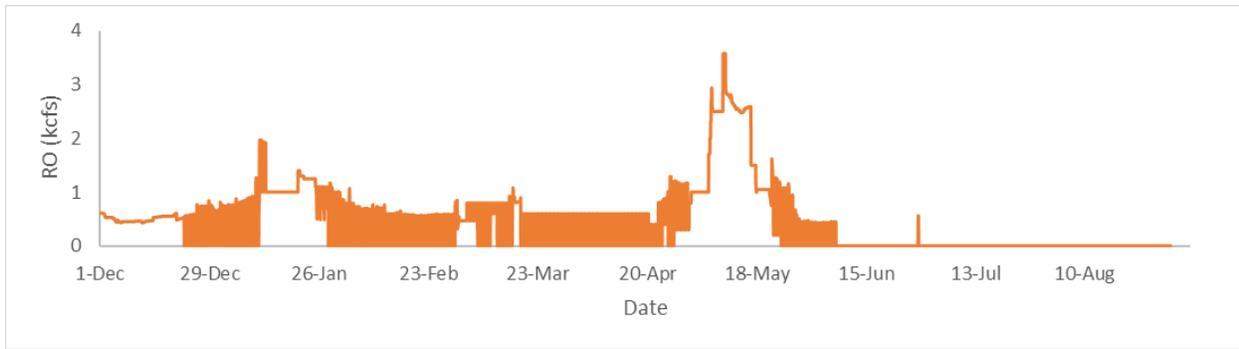


**South Santiam River Above Foster Dam Discharge and Foster Dam Head of Reservoir Capture Data**

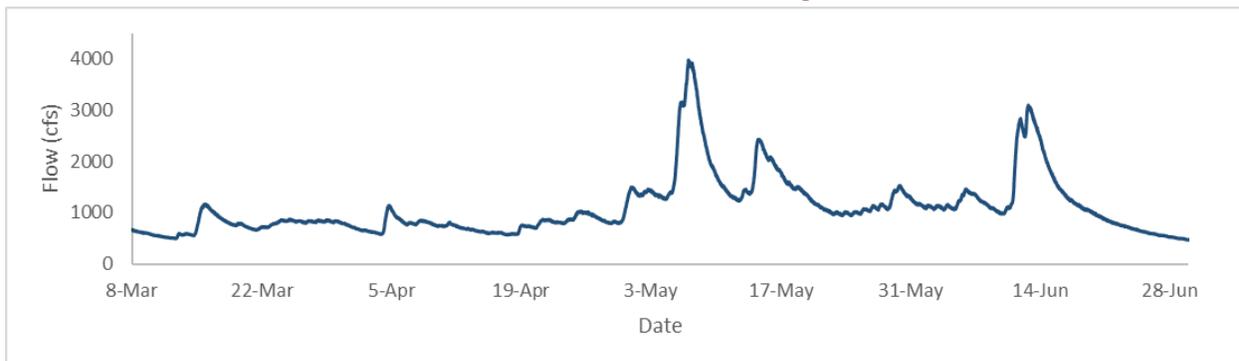


**Cougar Dam Operational and Capture Data Since Start of Monitoring**

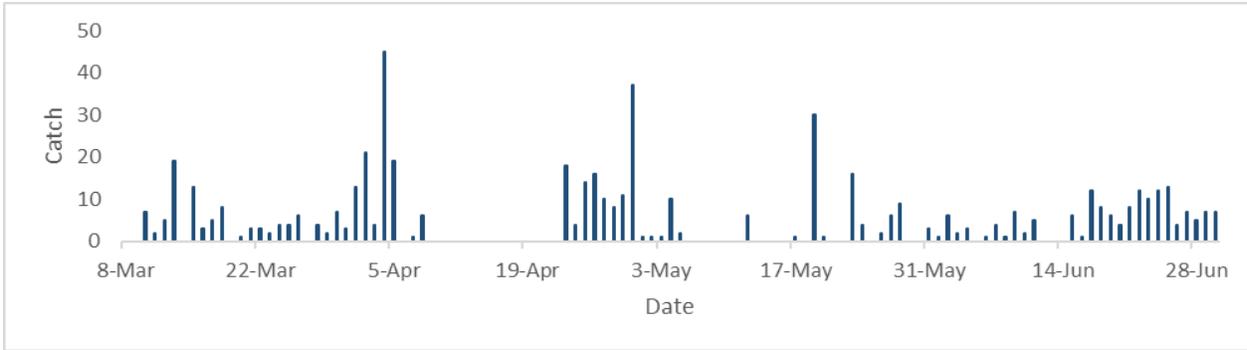




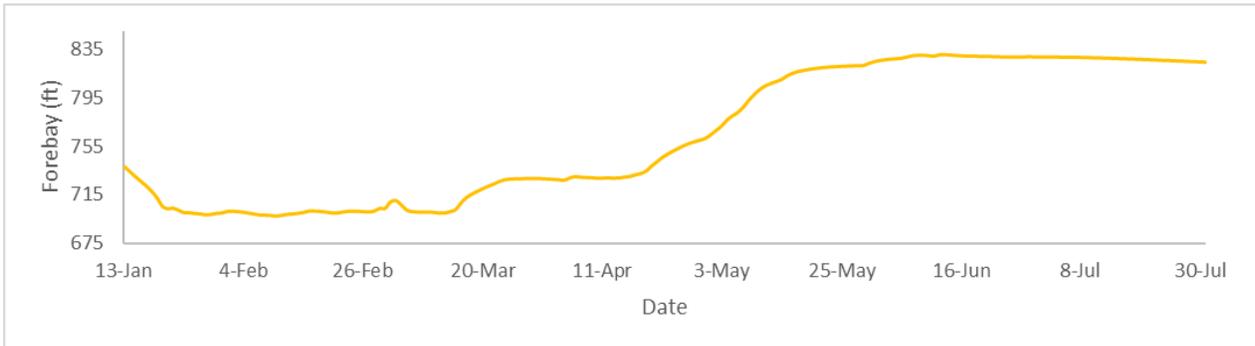
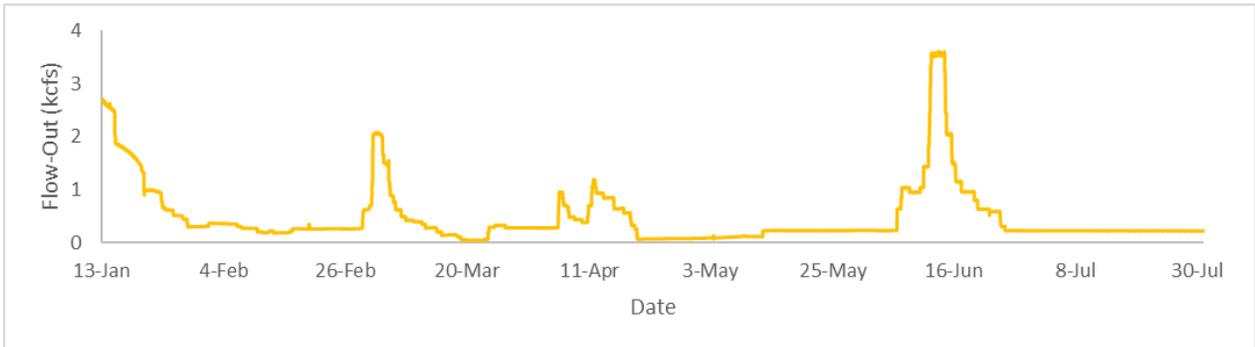
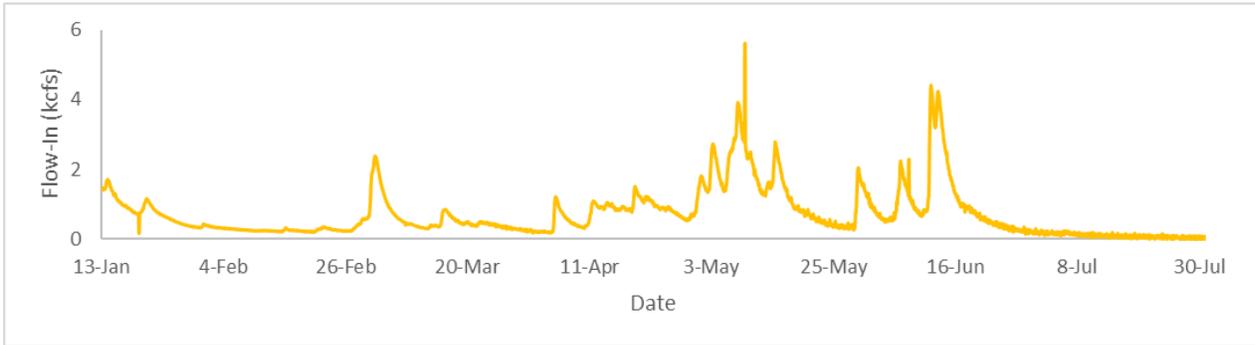
**South Fork McKenzie above Cougar Dam Discharge and Cougar Dam Head of Reservoir Capture Data Since Start of Monitoring**



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

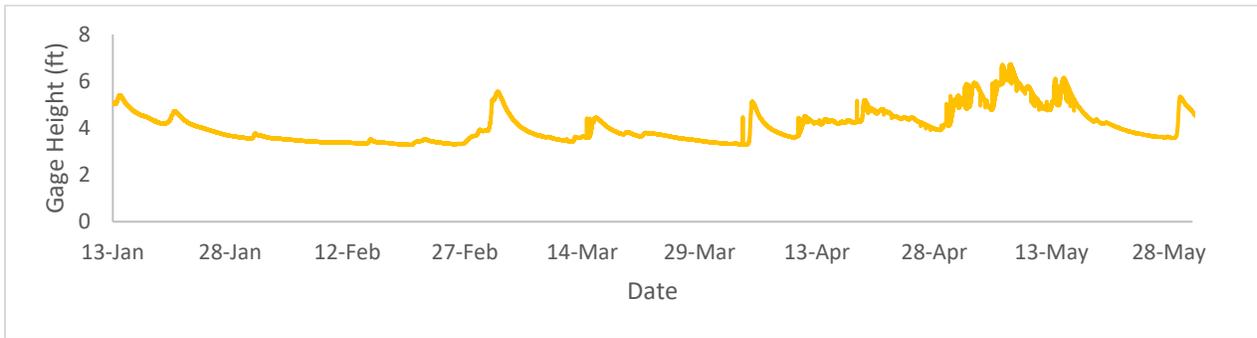


**Fall Creek Dam Tailrace Operational and Capture Data Since Start of Monitoring**

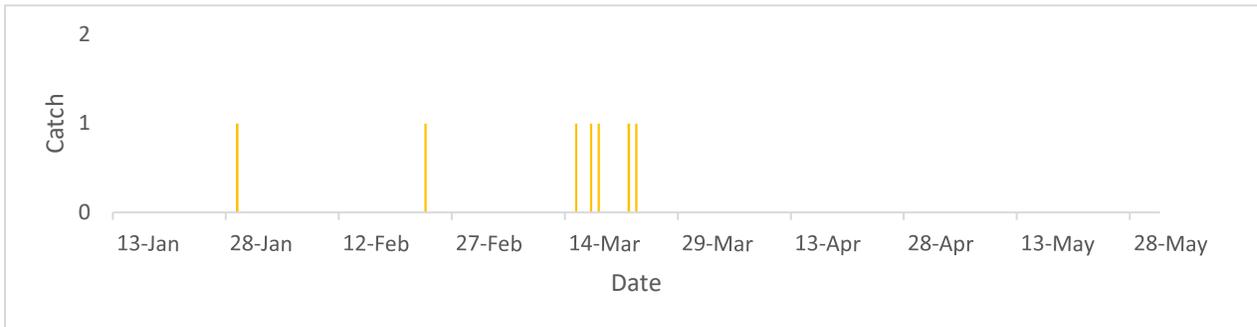


Note: Operational data was being tracked for Fall Creek Head of Reservoir site prior to initiation of Fall Creek Dam monitoring.

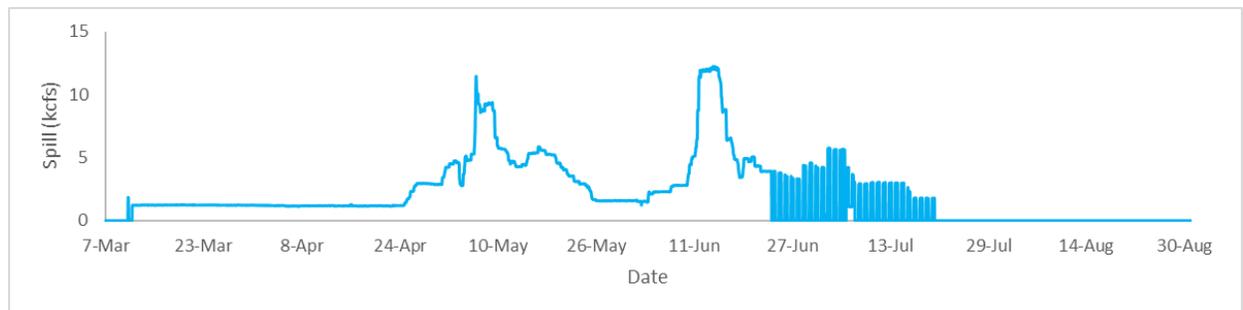
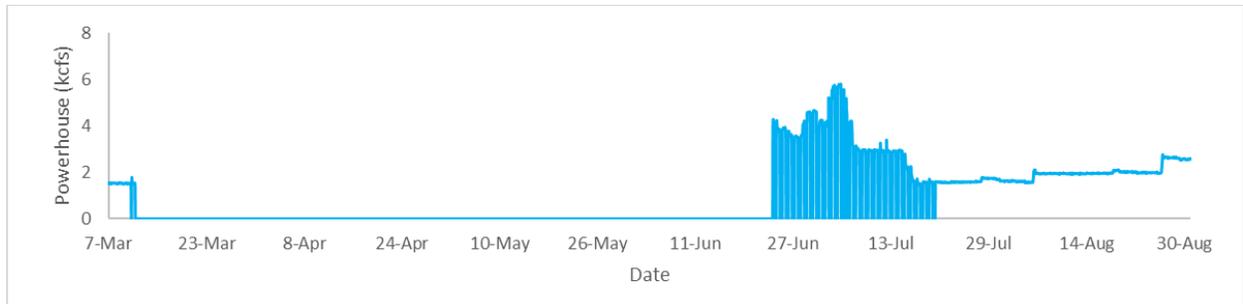
### Fall Creek Head of Reservoir Operational and Capture Data Since Start of Monitoring

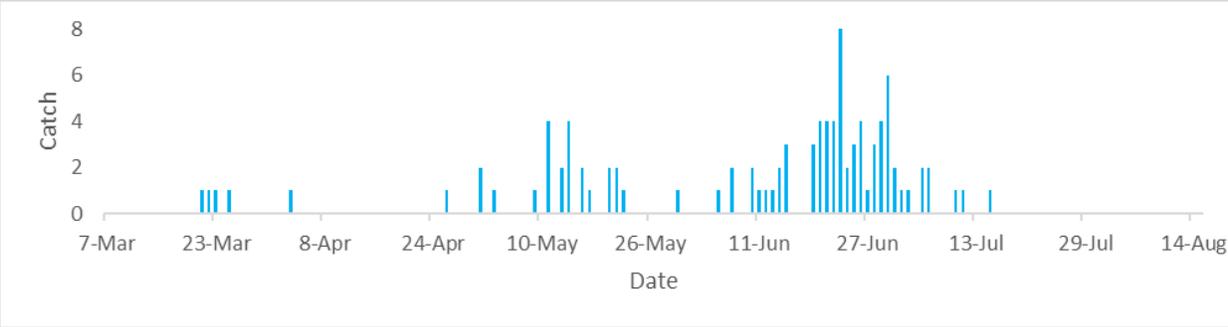
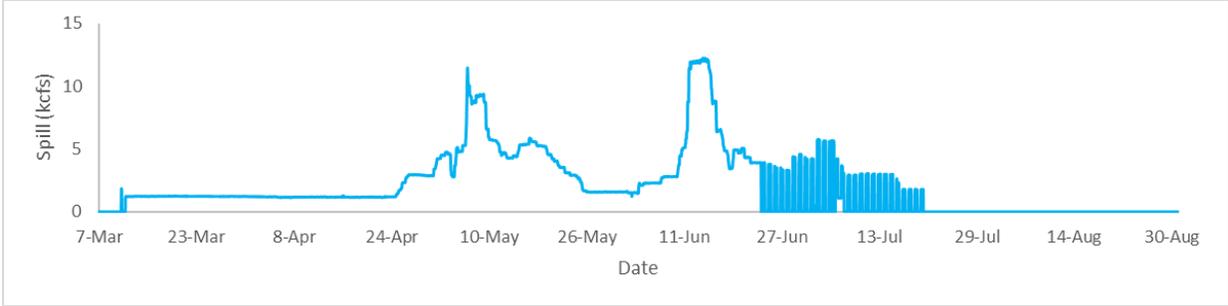


Note: Gage height data was taken from USGS stream gage number 14150290, 1.2 rkms downstream.

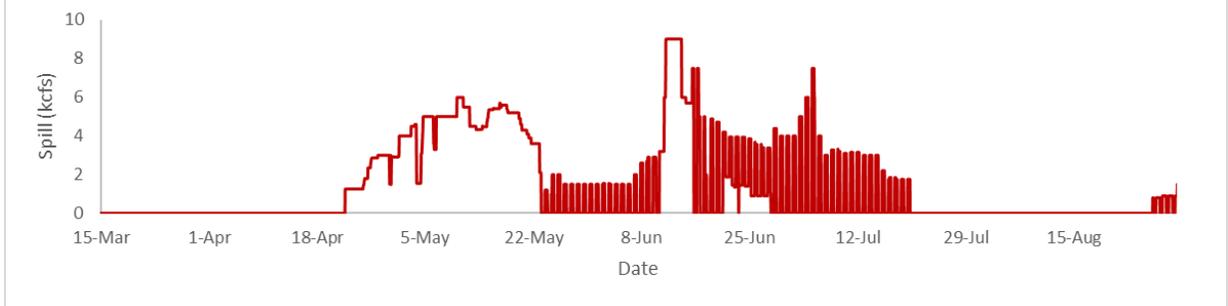
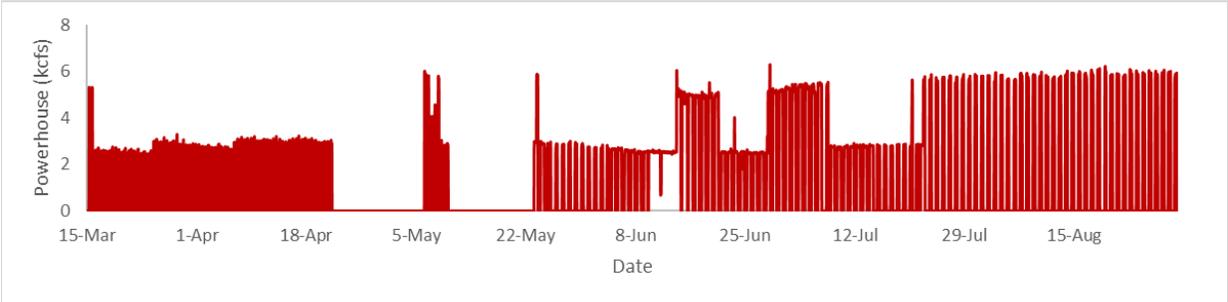


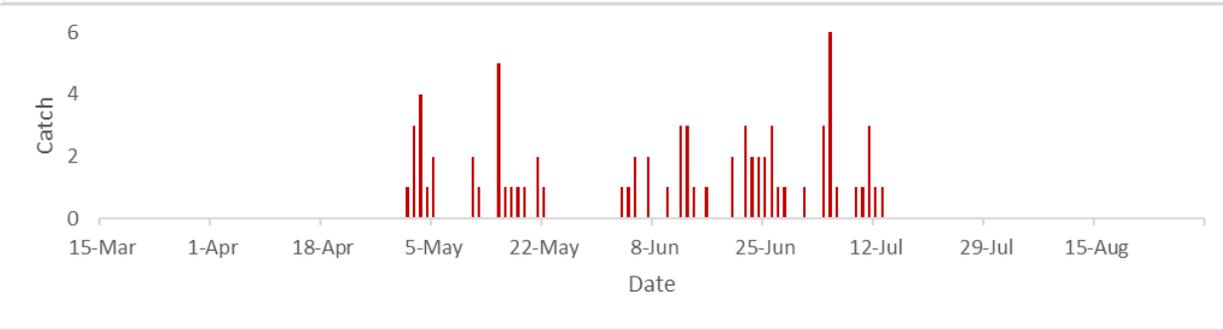
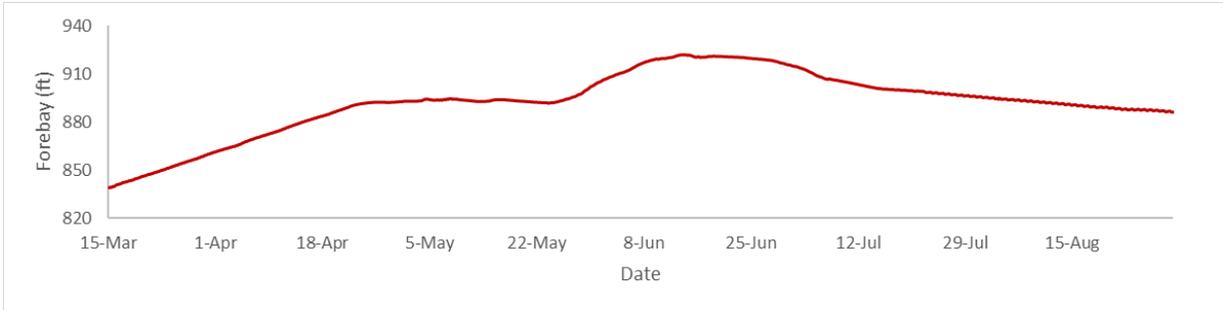
### Dexter Dam Operational and Capture Data Since Start of Monitoring



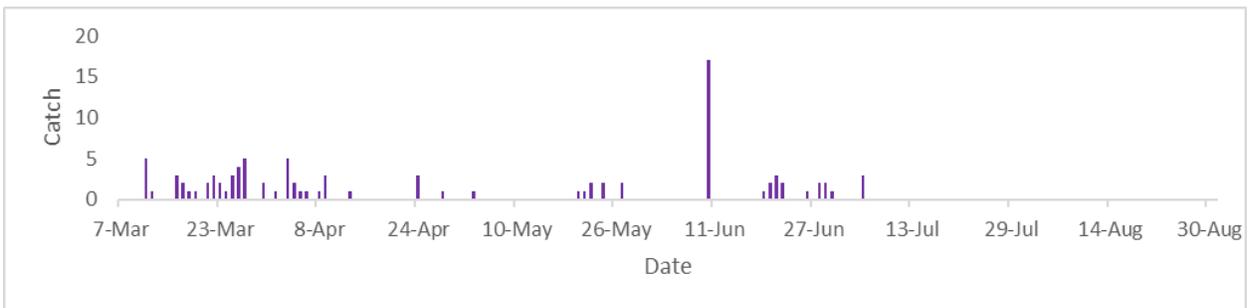
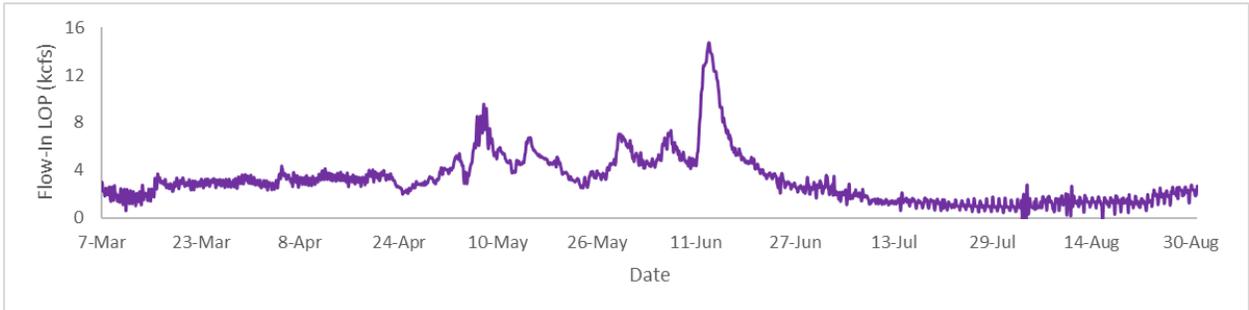


**Lookout Dam Tailrace Operational and Capture Data**

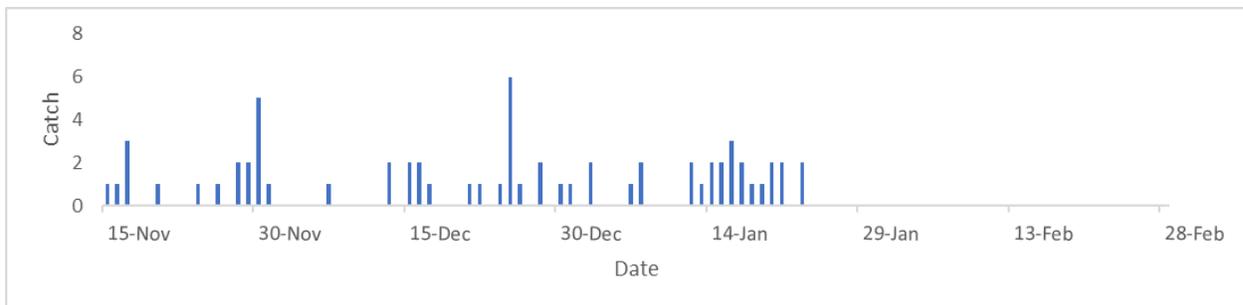
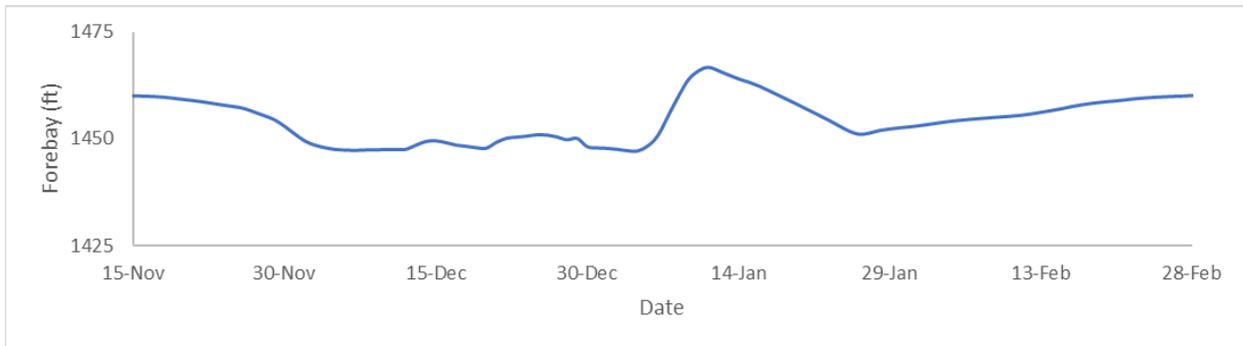
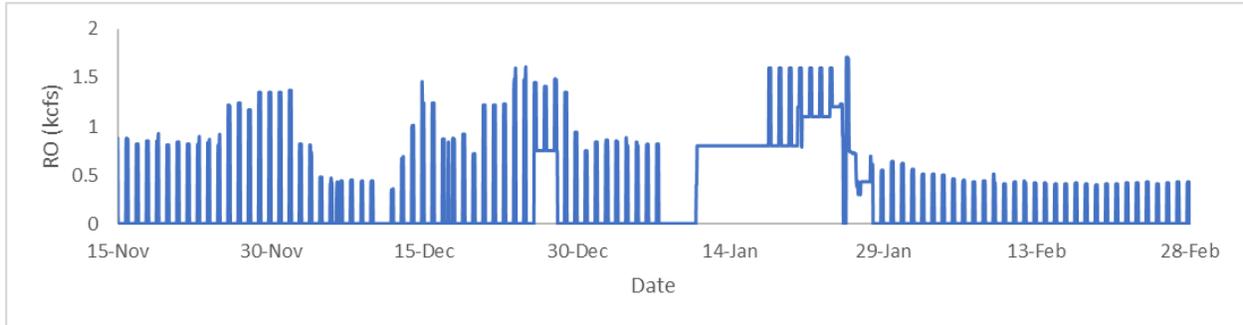
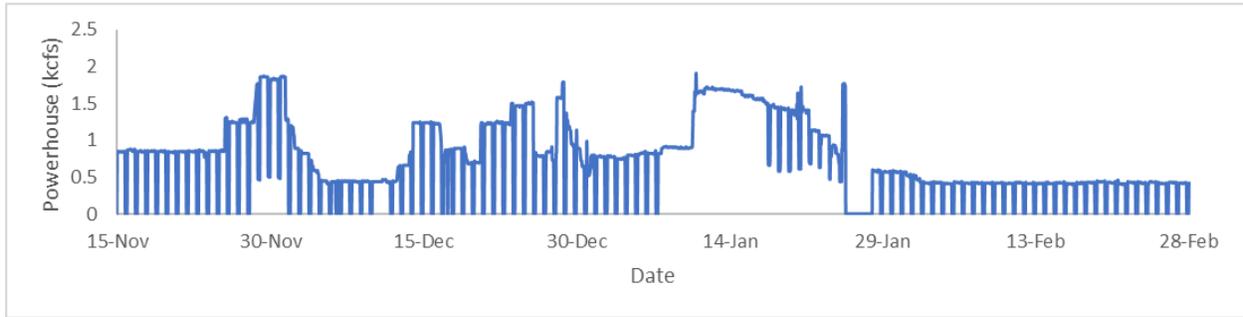




**Lookout Point Head of Reservoir Operational and Capture Data Since Start of Monitoring**



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

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

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

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

<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)

<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)

<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

<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)

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

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

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

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

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

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

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

## Appendix D

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

Site	Trap	# of PIT Tagged Fish
Big Cliff Dam	8 ft	0
Foster Dam Head of Reservoir- South Santiam	5 ft	0
Cougar Dam	PWR	0
Cougar Dam	RO	0
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	PWR	0

### To Date Summary of Captured Fish Containing PIT Tags

Site	Trap	PIT Tag #	Date	Species
Cougar Dam	RO	3DD.0077780789	1/8/2022	Chinook
Cougar Dam	RO	384.36F2B2C55F	1/14/2022	Chinook
Cougar Dam	PH	3DD.003DA4DC74	3/3/2022	Chinook
Cougar Dam	PH	3DD.003E14CA70	3/4/2022	Chinook
Cougar Dam	PH	384.36F2B2C5D2	3/4/2022	Chinook
Cougar Dam	PH	3DD.003E14CC20	3/5/2022	Chinook
Cougar Dam	PH	3DD.003E14C9D6	3/6/2022	Chinook
Cougar Dam	PH	3DD.003E14CD8D	3/8/2022	Chinook
Cougar Dam	RO	3DD.003BD59645	4/7/2022	Chinook
Cougar Dam	PH	3DD.003BD21883	7/23/2022	O. mykiss
Cougar Dam	PH	3DD.003BD21883	7/26/2022	O. mykiss

### List of EAS PIT Tagged Fish for Reporting Period

No fish were PIT tagged this reporting period.