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Report Period:	January 1 to January 15, 2022
Report No.:	2022 Willamette RST Bi-Weekly Report 01/01 – 01/15 by EAS
Re:	**WILLAMETTE VALLEY FISH PASSAGE MONITORING VIA ROTARY SCREW TRAPS**

Project Schedule

Table 1. Project Schedule

Site	Task	Start	End	Days
Hills Creek RO and PWR	Deployment	10/12/21	10/12/21	1
Hills Creek RO	Operation	10/21/21	3/15/22	146
Hills Creek PWR	Operation	10/23/21	3/15/22	144
Big Cliff Dam	Trap Efficiency Release (1,000 Fish)	12/22/2021	12/22/2021	1
Hills Creek	Trap Efficiency Release (1,200 fish, 600 per route)[a]	12/13/21	12/13/21	1
Cougar Dam	Trap Efficiency Release (1,200 Fish, 600 per route)	1/19/2022	1/19/2022	1
Cougar Dam RST	Operation	12/01/21	12/31/22	396
Big Cliff Dam RST	Operation	12/01/21	2/15/22	292
Big Cliff Dam RST	Operation	3/15/22	10/15/22	
Fall Creek RST	Operation	01/02/22	05/31/22	149

[a] Tentative schedule of first trap release.

Summary of Rotary Screw Trap Data

Rotary screw traps (RSTs) were operated at four locations in the southern Willamette River watershed: on the Middle Fork Willamette River below Hills Creek Dam (Hills Creek), the South Fork McKenzie river below Cougar Dam (Cougar Dam), the North Santiam River below Big Cliff Dam (Big Cliff) and Fall Creek above Fall Creek reservoir. The locations of the RST's are depicted in Figures 1, 2, 3 and 4 respectively. Sampling sites generally monitor individual routes for fish passage at the dams, including powerhouse (PWR) and regulating outlets (RO) and above reservoir free-flowing streams. Sampling began at the Hills Creek site on October 21, 2021, at the Cougar and Big Cliff sites on December 1, 2021 and Fall Creek on January 13, 2022. Sampling dates and catch summaries are provided in Tables 2 and 3, respectively.

Figure 1. Hills Creek Dam RST Locations

Figure 2. Cougar Dam RST Locations

Figure 3. Big Cliff RST Location

Figure 4. Fall Creek 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
Hills Creek RO	10/21/21	01/01/22	01/15/22	15 days	76 days
Hills Creek PWR	10/21/21	01/01/22	01/15/22	15 days	76 days
Cougar RO	12/1/21	01/01/22	01/15/22	15 days	45 days
Cougar PWR	12/1/21	01/01/22	01/15/22	15 days	45 days
Big Cliff	12/1/21	01/01/22	01/15/22	15 days	45 days
Fall Creek	01/13/22	01/01/22	01/15/22	2 days	2 days

Table 3. Willamette Valley Rotary Screw Trap Monitoring Catch Summary

Site	Species	Catch (Reporting Period)	Recaptures (Reporting Period)	Total Catch	Total Recaptures
Hills Creek	CHS	50	25	122	25
Cougar	CHS	18	0	42	0
Big Cliff	CHS	14	0	70	39
Fall Creek	CHS	0	0	0	0

Middle Fork Willamette – Hills Creek Dam

Target Species

This reporting period began on January 1 and ended on January 15. A total of 14 Chinook salmon (CHS) were captured during the 15-day sampling period (Figure 5). Sampling durations were 100% for both RO RST and Powerhouse RST. Table 4 provides life stage, length, and weight data for all Chinook salmon that have been caught at the Hills Creek site to-date and Figure 5 shows length frequency data to-date.

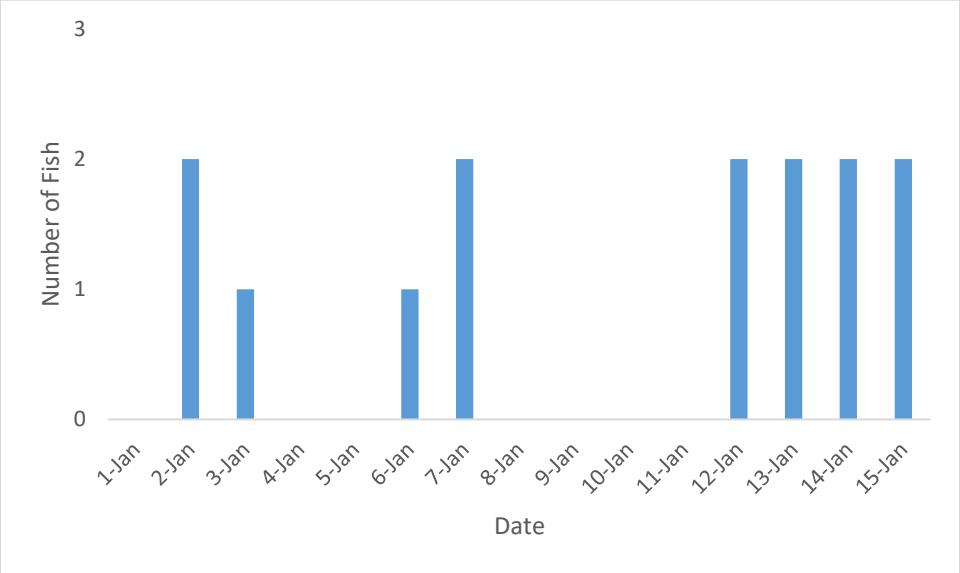


Figure 5. Chinook Captured Per Day 01/01/2022 to 01/15/2022 (Hills Creek)

Table 4. Descriptive Statistics of Target Species Captured at Hills Creek Dam Season To-Date and for the Reporting Period

To-Date											
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*			
					Min	Max	Mean	Min	Max	Mean	
Hills Creek	RO	CHS	Parr	6	90.0	141.0	110.7	7.4	23.4	13.3	
		CHS	Smolt	55	137.0	265.0	232.2	27.4	192.3	144.4	
Hills Creek	PWR	CHS	Parr	0	n/a	n/a	n/a	n/a	n/a	n/a	
		CHS	Smolt	22	144.0	265.0	230.0	34.6	202.2	138.9	

January 1 - 15, 2022											
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*			
					Min	Max	Mean	Min	Max	Mean	
Hills Creek	RO	CHS	Parr	2	90.0	94.0	92.0	7.4	8.4	7.9	
		CHS	Smolt	3	245.0	265.0	252.0	144.2	187.6	164.8	
Hills Creek	PWR	CHS	Parr	0	n/a	n/a	n/a	n/a	n/a	n/a	
		CHS	Smolt	9	156.0	265.0	231.8	46.6	202.2	142.9	

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

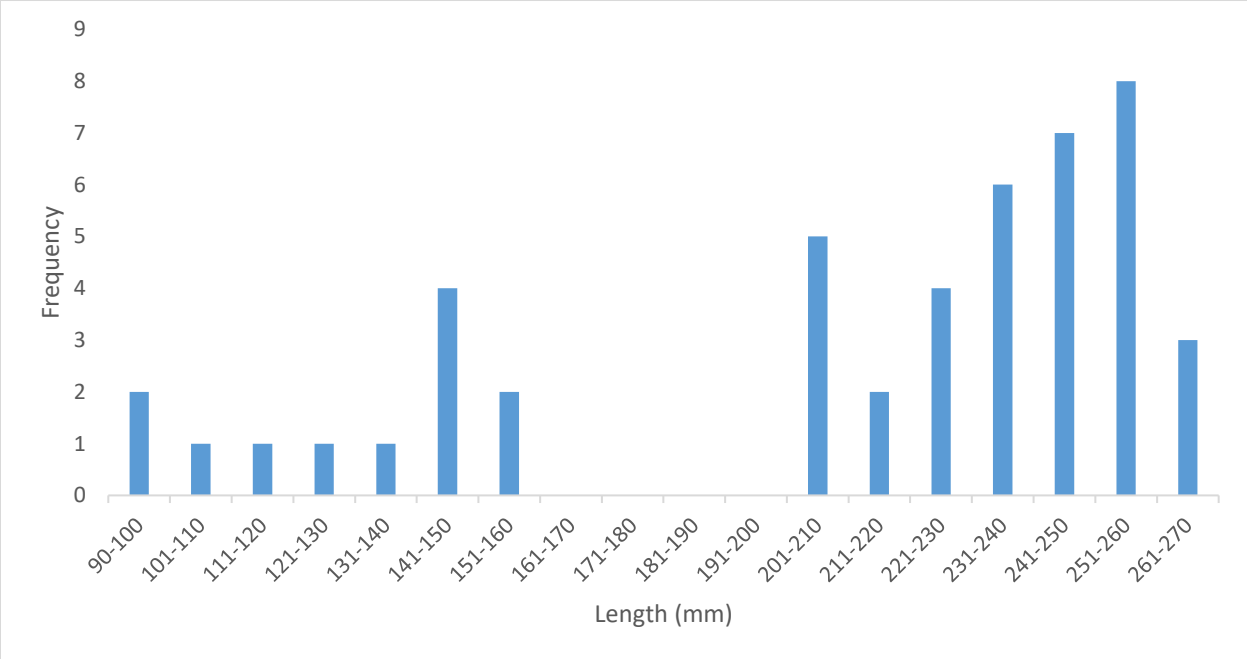


*Figure does not include fish without heads

Figure 6. Length Frequency of Juvenile Chinook Sampled Season To-Date (Hills Creek)

Trapping Efficiency

A total of 596 juvenile Chinook (parr) were dyed and released on 01/06/2022 below Hills Creek PWR and 605 below the RO to evaluate the efficiency of the screw trap at those locations. A total of 19 fish were recaptured in the 8ft PWR trap and 13 in the 5ft RO trap on 01/07/2022, with 1 more fish captured in the PH trap on 01/08/2022 for a total of 20 recaptures in the PH trap. In addition, 5 PH released fish were recaptured in the RO trap. Route-specific trapping efficiency was 3.36% at the PH trap and 2.15% at the RO. A total of 28% of the recaptures in the RO trap were PH released fish.

Of the fish recaptured, 4 were dead and an additional 33 were injured of the total 38 recaptures. Injuries were primarily descaling (26) and fin damage (34). Mt. Hood Environmental staff noted that fish appeared to be in poor condition upon retrieval from the hatchery.

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.
*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.

Injuries and Copepod Infection

Partial descaling <20% was observed on 16 of 23 Chinook collected at the RO RST (69.6%), and 14 of 28 Chinook collected at the PWR RST (50%). Descaling >20% was observed on 2 of 23 Chinook collected at the RO RST (8.6%), and 6 of 28 Chinook collected at the PWR RST (21.4%). 17 of 51 Chinook fish collected during this reporting period had copepods present (33.3%). Of the 51 Chinook captured, 4 displayed body injuries and 4 had eye injuries present. There was 1 Chinook mortality collected in the RO RST, and 10 collected in the PWR RST (Table 5). A summary of injuries observed during the reporting period, and for the duration of the season are provided in Appendix A.

Table 5. Number of Descaled and Partially Descaled Chinook Salmon for Sampling Period.

Site	# CHS Collected	# DSC* <20%	# DSC* >20%	# with Body Injuries	# with Eye Injuries	# with COP* In B.C.	# with COP* on Fins	Mortalities
Hills Creek RO	5	3	1	2	0	3	2	1
Hills Creek PWR	9	7	2	6	2	8	4	7

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

Non-Target Species

A total of 28 non-target fish were captured at Hills Creek during the reporting period; the data is summarized below in Table 6.

Table 6. Summary of Non-target Species (Hills Creek).

Species	RO Capture	RO Mortality	PWR Capture	PWR Mortality	Season Total	Season Total Mortality
Bluegill	2	1	18	15	50	26
Brook Lamprey	0	0	0	0	1	0
Bullhead	0	0	0	0	1	0
Bull Trout	0	0	0	0	1	0
Crappie	0	0	0	0	54	39
Longnose Dace	0	0	0	0	2	0
Red-Sided Shiner	0	0	1	0	17	2
Sculpin	0	0	2	0	35	0
Spotted Bass	0	0	0	0	6	1
Sucker	0	0	0	0	2	1
Whitefish	0	0	0	0	1	1
O. mykiss	2	0	2	0	52	15
Totals	**4**	**1**	**23**	**15**	**222**	**85**

Stream Statistics

Basic stream statistics at the Hills Creek site were calculated from data downloaded from the U.S. Geological Survey stream gage number 14145110. Gage height (feet) is the only metric provided at this gage. During the reporting period, daily maximum values for instantaneous gage height ranged from 1,225.01 feet to 1,227.78 feet (mean: 1,226.2 feet). Figure 7 shows instantaneous gage height.

Stream temperatures were recorded every 2 hours for the both the RO RST and the PWR RST (Figures 8 and 9). Temperature probes operated normally throughout this reporting period.

Flows through the PWR and RO during the reporting period averaged 1,072 and 353.1 cubic feet per second (cfs) respectively (Figure 10). 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 Chinook CPUE, Hills Creek.

	Chinook	
Description	RO (5ft)	PWR(8ft)
Catch	5	9
Effort (hrs)	385.58	361.02
CPUE (fish/hr)	0.013	0.0249

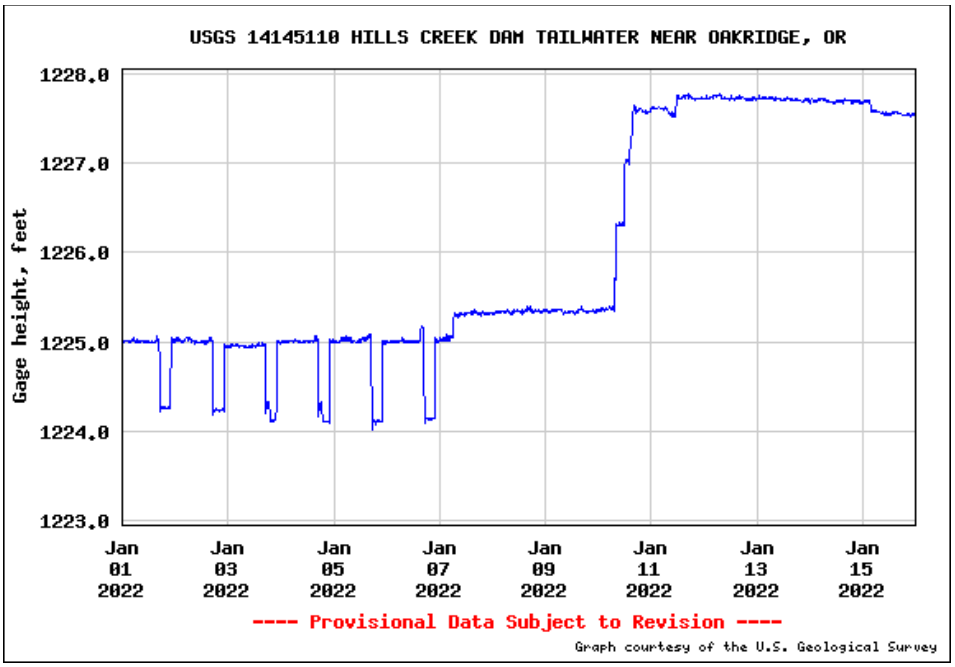


Figure 7. Gage Height (feet); below Hills Creek Dam, Middle Fork Willamette River

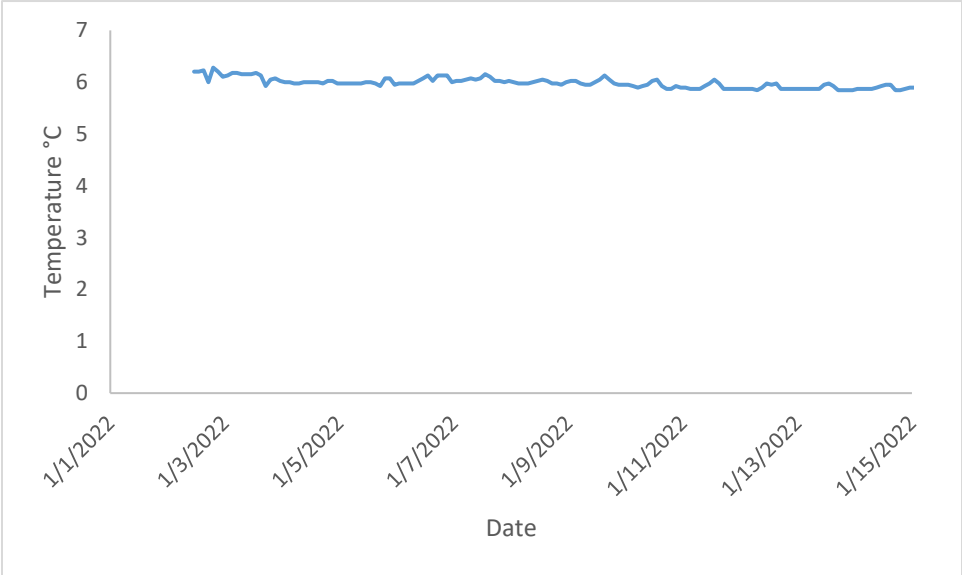


Figure 8. Temperature at RO RST (Hills Creek)

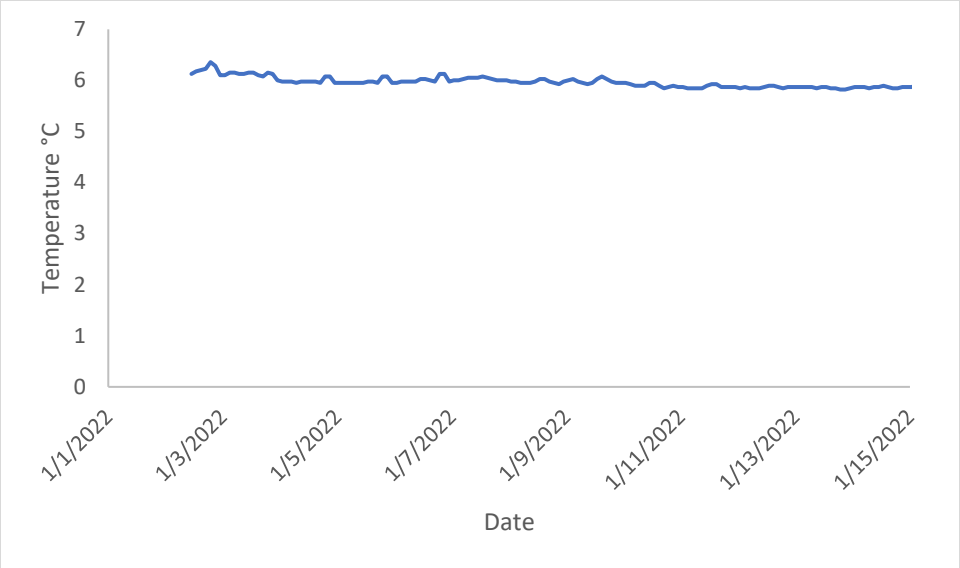


Figure 9. Temperature at Powerhouse RST (Hills Creek)

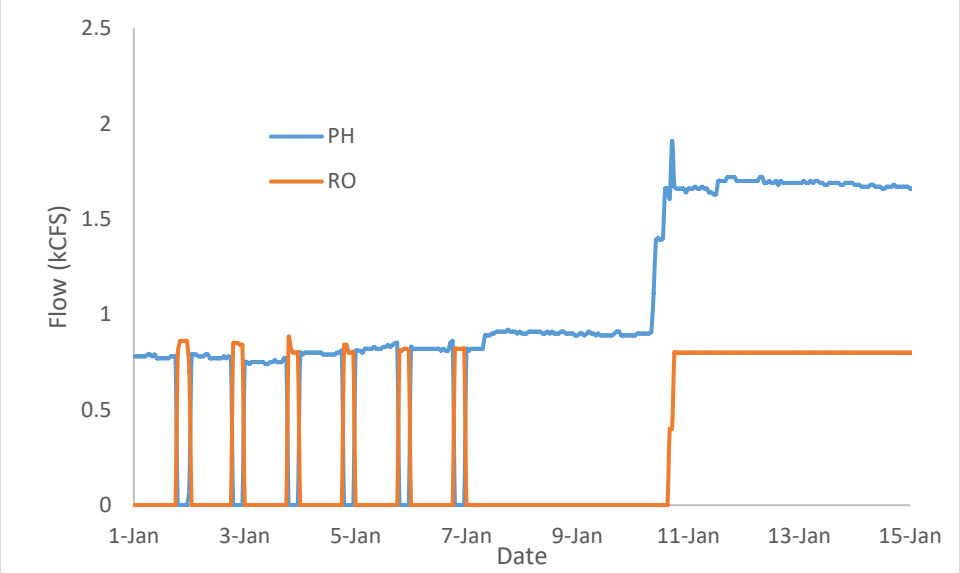


Figure 10. Hourly Flows PWR vs. RO (Hills Creek)

South Fork McKenzie – Cougar Dam

Target Species

This reporting period began on January 1 and ended on January 15. There was a total of 19 Chinook salmon (CHS) during the 15-day sampling period (Figure 11). 2 of the captured Chinook were AD clipped and found to have PIT Tags and thus were not included in 24 hour holds. (Tag info was provided to ODFW). Sampling duration was 100% for both RO RST and Powerhouse RST. There was no flow through the powerhouse on January 7 during the reporting period. Table 8 provides life stage, length, and

weight data for all Chinook salmon that have been caught at the Cougar Dam site to-date and Figure 11 shows length frequency data to-date.

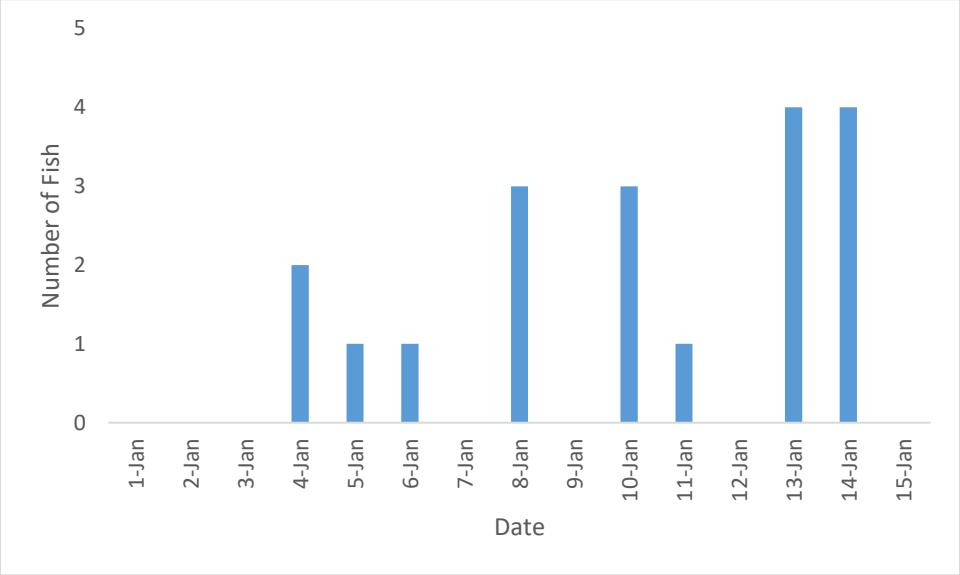


Figure 4. Chinook Captured Per Day 01/01/2022 to 01/15/2022 (Cougar Dam)

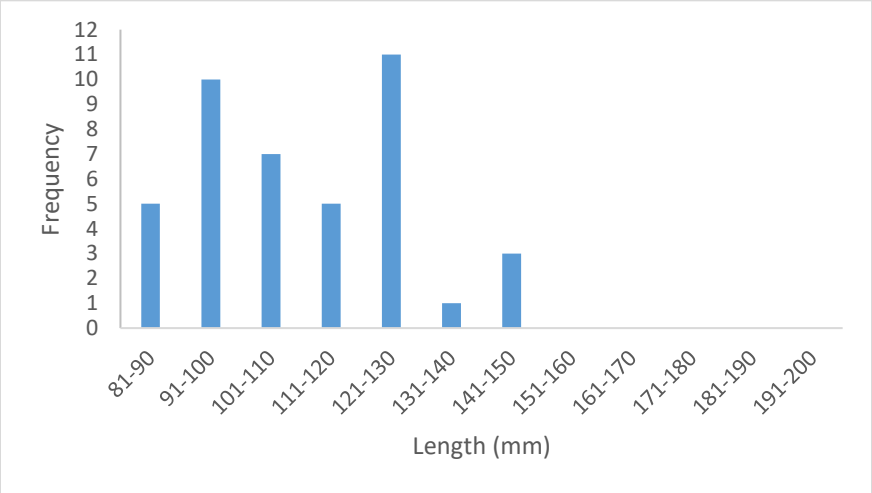


*Figure does not include fish without heads

Figure 12. Length Frequency of Juvenile Chinook Sampled Season To-Date (Cougar Dam)

Table 8. Descriptive Statistics of Target Species Captured at the Cougar Dam Season To-Date

To-Date										
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Cougar	RO	CHS	Smolt	5	95	150	127.8	8.8	29.2	21.1
		CHS	Parr	16	83	145	106.1	6.4	30.7	13.0
Cougar	PWR	CHS	Smolt	4	116	130	125.0	16.9	23.0	20.9
		CHS	Parr	18	81	142	110.7	5.4	29.8	15.2

January 1-15, 2022										
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Cougar	RO	CHS	Parr	8	83	108	99.9	6.4	14.1	10.0
		CHS	Smolt	4	95	150	128.0	8.8	29.2	21.2
Cougar	PWR	CHS	Smolt	3	116	130	124.3	16.9	23	20.3
		CHS	Parr	4	81	103	92.5	5.4	11.1	8.8

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

24-Hour Post Collection Holding Trial

A total of 12 Chinook captured in the RSTs were held for ~24 hours in holding tanks and then evaluated for survival rates. All fish (100%) held during this period were released alive.

Injuries and Copepod Infection

Partial descaling <20% was observed on 4 of 12 Chinook collected at the RO RST (33%), and descaling >20% was observed on 2 of 12 Chinook collected at the RO RST (10%). Of the 12 chinook captured in the RO RST 2 displayed body injuries (10%) and 1 had eye injury (8%). 6 of the RO RST chinook had copepods present in the branchial cavity (50%) and 8 had copepods present on fins (66%). Partial descaling <20% was observed on 1 of 7 Chinook collected at the PWR RST (14%), and descaling >20% was observed on 3 of 7 Chinook collected at the PWR RST (43%). One of the PWR RST fish had bodily injury (14%) and one displayed eye injury. 5 of the 7 PWR RST fish had copepods present in the branchial cavity (71%) and 4 had copepods present on fins (57%). There were 2 chinook mortalities collected in the RO RST (10%) and 3 collected in the PWR RST (43%). A summary of injuries observed during the reporting period, and for the duration of the season are provided in Appendix A.

Table 9. Number of Descaled and Partially Descaled Chinook Salmon (Cougar Dam).

Site	# CHS Collected	# DSC* <20%	# DSC* >20%	# with Body Injuries	# with Eye Injuries	# with COP* In B.C.	# with COP* on Fins	Mortalities
Cougar RO	12	4	2	2	1	6	8	2
Cougar PWR	7	1	3	1	1	5	4	3

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

Non-Target Species

A total of 5 non-target species fish were captured during the reporting period; the data is summarized below in Table 10.

Table 10. Summary of Non-target Species (Cougar Dam).

Species	RO Capture	RO Mortality	PWR Capture	PWR Mortality	Season Total Live	Season Total Mortality
Bluegill	0	0	0	0	0	0
Brook Lamprey	0	0	0	0	0	0
Bullhead	0	0	0	0	0	0
Crappie	0	0	0	0	0	0
Longnose Dace	0	0	0	0	0	0
Kokanee	0	0	0	0	0	0
Red-Sided Shiner	0	0	0	0	0	0
Sculpin	0	0	2	0	2	0
Spotted Bass	0	0	0	0	0	0
Sucker	0	0	0	0	0	0
Whitefish	0	0	0	0	1	0
O. mykiss	2	0	1	0	6	0
Totals	**2**	**0**	**3**	**0**	**9**	**0**

Stream Statistics

Basic stream statistics at the Cougar Dam site were calculated from data downloaded from the U.S. Geological Survey stream gage number 14159410. Gage height (feet) is the only metric provided at this gage. During the reporting period, daily maximum values for instantaneous gage height ranged from 1,253.42 feet to 1,254.39 feet (mean: 1,253.92 feet). Figure 13 shows instantaneous gage height.

Stream temperatures were recorded every 2 hours for the length of the report period for the RO and PWR RST's (Figure 14 and 15 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 470.6 and 788.8 cubic feet per second (cfs) respectively (Figure 16). Catch per unit of effort (CPUE) data are summarized in Table 11. Discharge and capture data for the duration of monitoring efforts at this location are provided in Appendix B.

Table 11. Summary of salmonid CPUE, Cougar Dam.

	Chinook	
Description	RO (5ft)	PWR(8ft)
Catch	12	7
Effort (hrs)	360.55	744.3
CPUE (fish/hr)	0.0331	0.0094

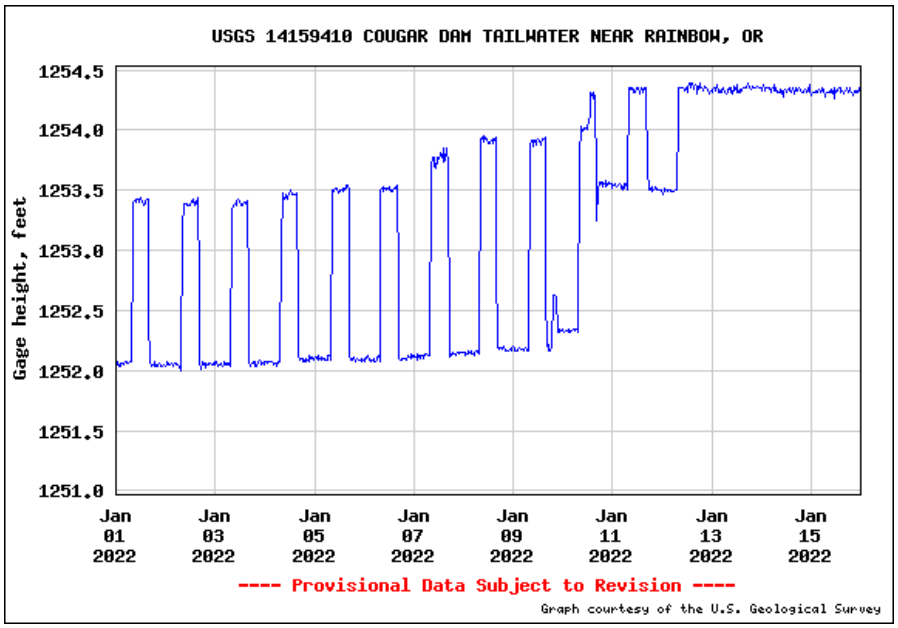


Figure 53. Gage Height (feet); below Cougar Dam, South Fork McKenzie River

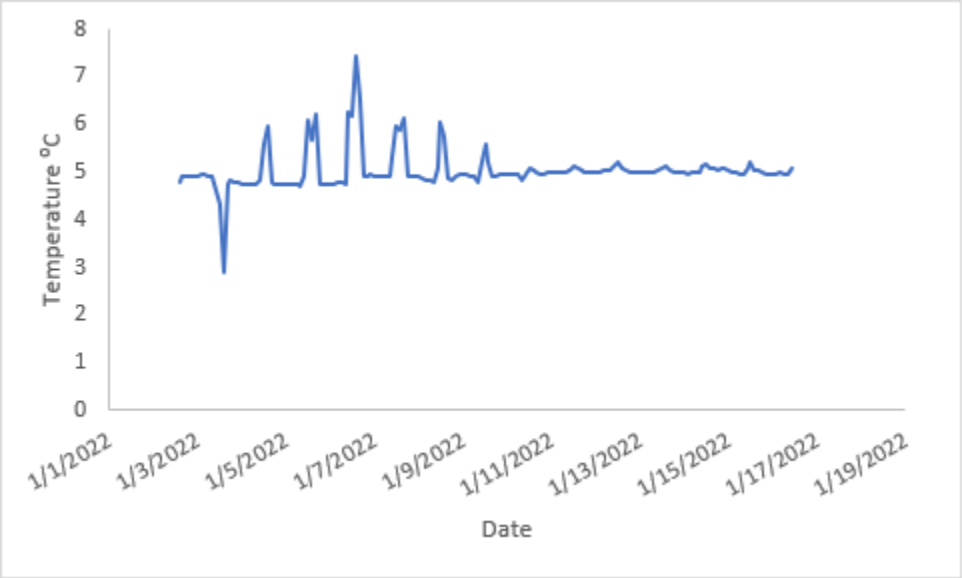


Figure 14. Temperature at RO RST (Cougar Dam)

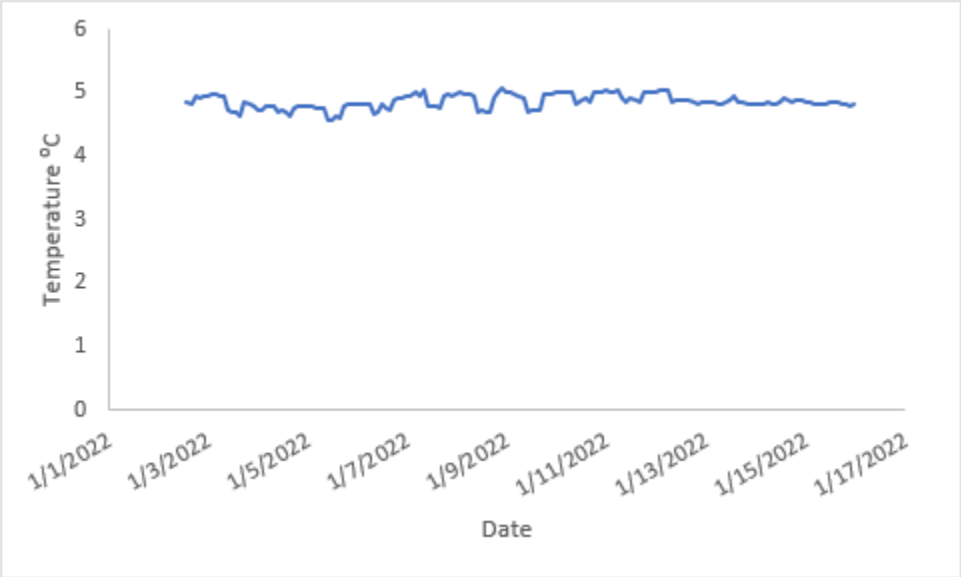


Figure 65. Temperature at PWR RST (Cougar Dam)

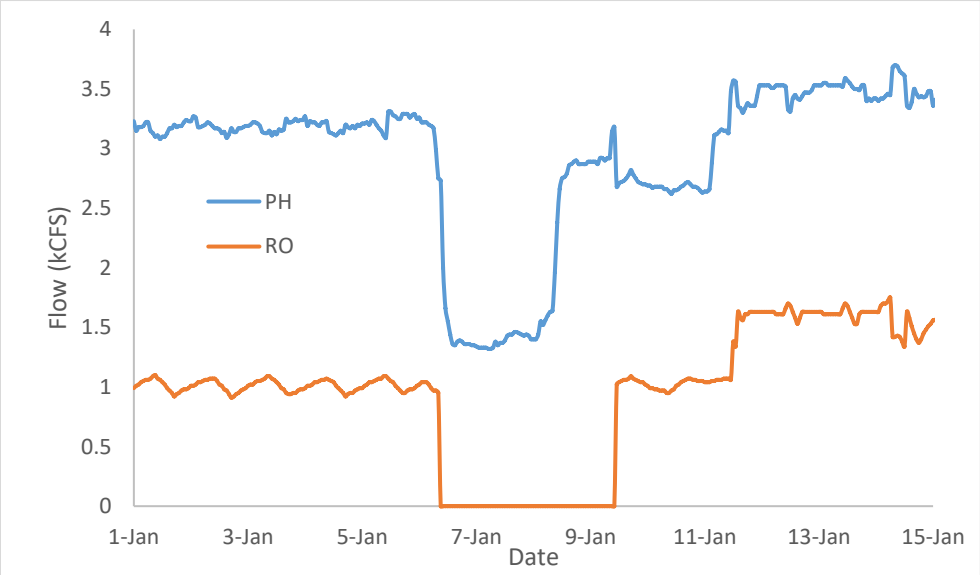


Figure 76. Hourly Flows PWR vs. RO (Cougar Dam)

North Santiam – Big Cliff Dam

Target Species

The reporting period began on January 1 and ended on January 15. 10 Chinook salmon (CHS) were collected during the 15-day sampling period (Figure 17). The trap was operated 100% of the reporting period. Table 12 provides life stage, length, and weight data for all Chinook salmon that have been caught at the Big Cliff site to-date and Figure 18 shows length frequency data to-date.

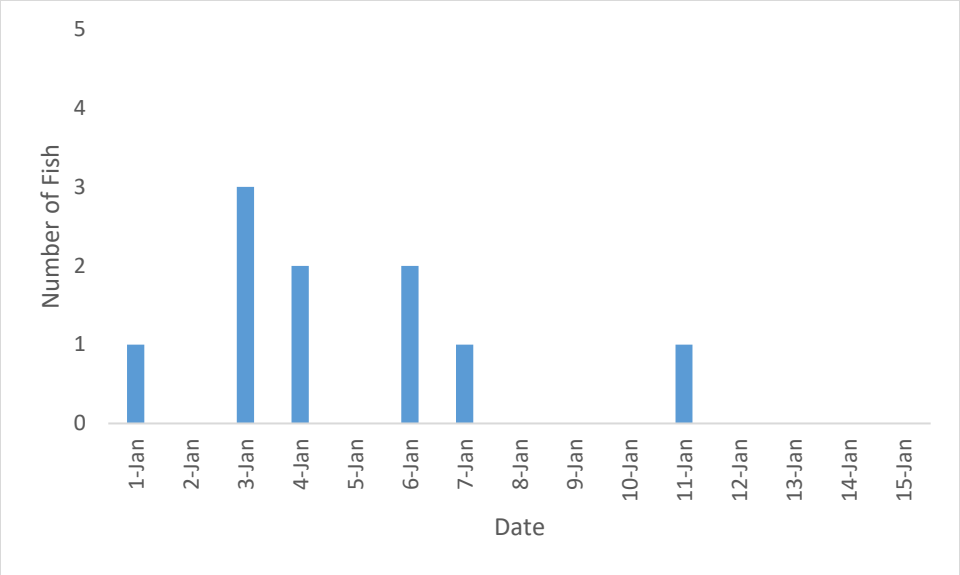


Figure 17. Chinook Captured Per Day 01/01/2022 to 01/15/2022 (Big Cliff)

Table 12. Descriptive Statistics of Target Species Captured at Big Cliff Dam Season To-Date

To-Date										
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Big Cliff	PWR	CHS	Parr	8	78.0	110.0	96.9	6.1	20.0	10.2
		CHS	Smolt	23	118.0	210.0	166.7	18.1	90.8	47.7

January 1 - 15, 2022										
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*		
					Min	Max	Mean	Min	Max	Mean
Big Cliff	PWR	CHS	Parr	5	78.0	110.0	94.6	6.1	9.9	8.5
		CHS	Smolt	9	118.0	210.0	165.2	18.1	89.5	47.0

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

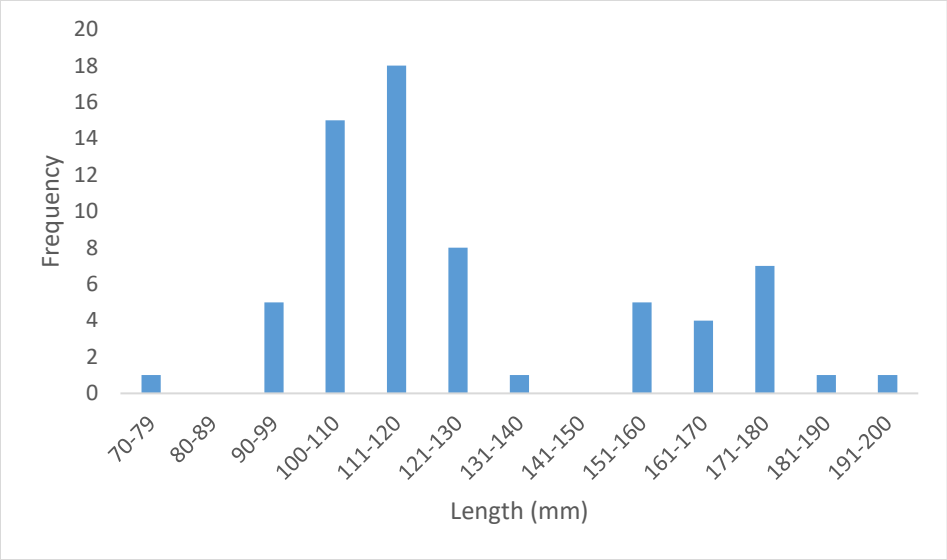


*Figure does not include fish without heads

Figure 18. Length Frequency of Juvenile Chinook Sampled Season To-Date (Big Cliff)

Injuries and Copepod Infection

Partial descaling <20% was observed on 5 of 14 target Chinook collected (36%), and descaling >20% was observed on 0 of 14 Chinook collected. 9 of 14 Chinook collected during this reporting period had copepods present in the branchial cavity (64%) and 2 had copepods present on fins (14%). Of the 14 Chinook captured, 6 displayed body injuries (43%) and 1 had eye injuries present (7%). There were 0 Chinook mortalities (Table 5). A summary of injuries observed during the reporting period, and for the duration of the season are provided in Appendix A.

Table 13. Number of Descaled and Partially Descaled Chinook Salmon.

Site	# CHS Collected	# DSC* <20%	# DSC* >20%	# with Body Injuries	# with Eye Injuries	# with COP* In B.C.	# with COP* on Fins	Mortalities
Big Cliff	14	5	0	6	1	9	2	0

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

Non-Target Species

A total of 42 non-target fish were captured at Big Cliff during the reporting period; the data is summarized below in Table 14.

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

Species	PWR Capture	PWR Mortality	Season Total	Season Total Mortality
Bluegill	0	0	4	2
Brook Lamprey	0	0	0	0
Bullhead	1	0	1	0
Crappie	0	0	0	0
Longnose Dace	0	0	0	0

Kokanee	40	14	66	28
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	0	0
O. mykiss	1	0	1	0
Totals	**42**	**14**	**72**	**30**

Stream Statistics

Basic stream statistics at the Big Cliff site were calculated from data downloaded from the U.S. Geological Survey stream gage number 14181410. Gage height (feet) is the only metric provided at this gage. During the reporting period, daily maximum values for instantaneous gage height ranged from 1,109.46 feet to 1,114.01 feet (mean: 1,112.97 feet). Figure 19 shows instantaneous gage height.

Stream temperatures were recorded every 2 hours for the Big Cliff RST (Figure 20). Temperature probes for the Big Cliff RST operated normally throughout this reporting period.

Flows through the Powerhouse and spill during the reporting period averaged 2,963.2 and 970.3 cubic feet per second (cfs) respectively (Figure 21). Catch per unit of effort (CPUE) data are summarized in Table 15. Discharge and capture data for the duration of monitoring efforts at this location are provided in Appendix B.

Table 15. Summary of salmonid CPUE, Big Cliff Dam.

	Chinook
Description	**PWR(8ft)**
Catch	66
Effort (hrs)	406.67
CPUE (fish/hr)	0.1623

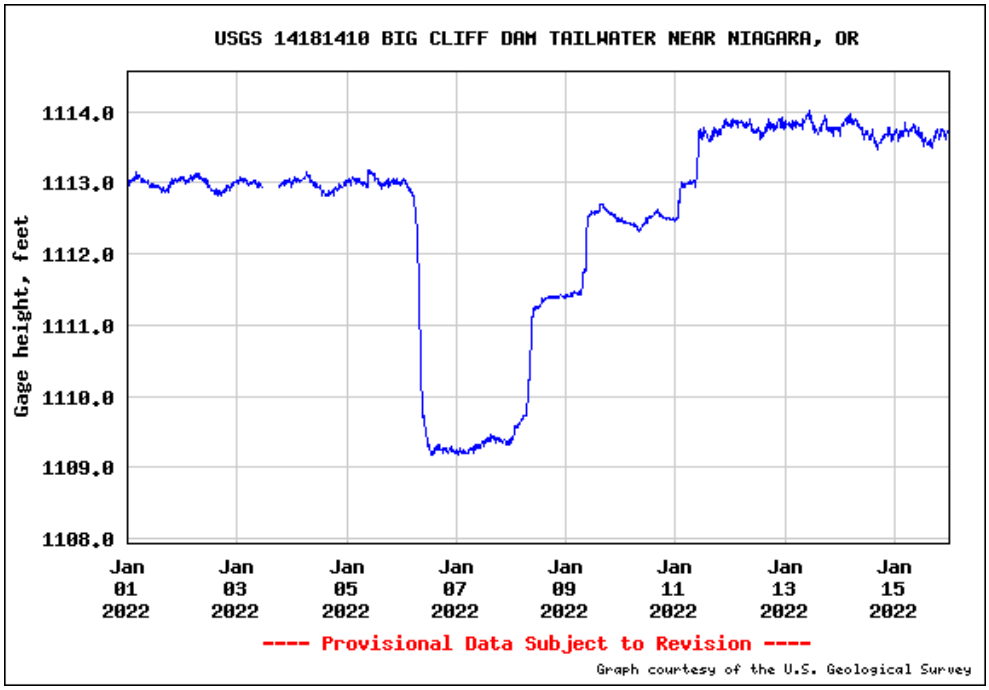
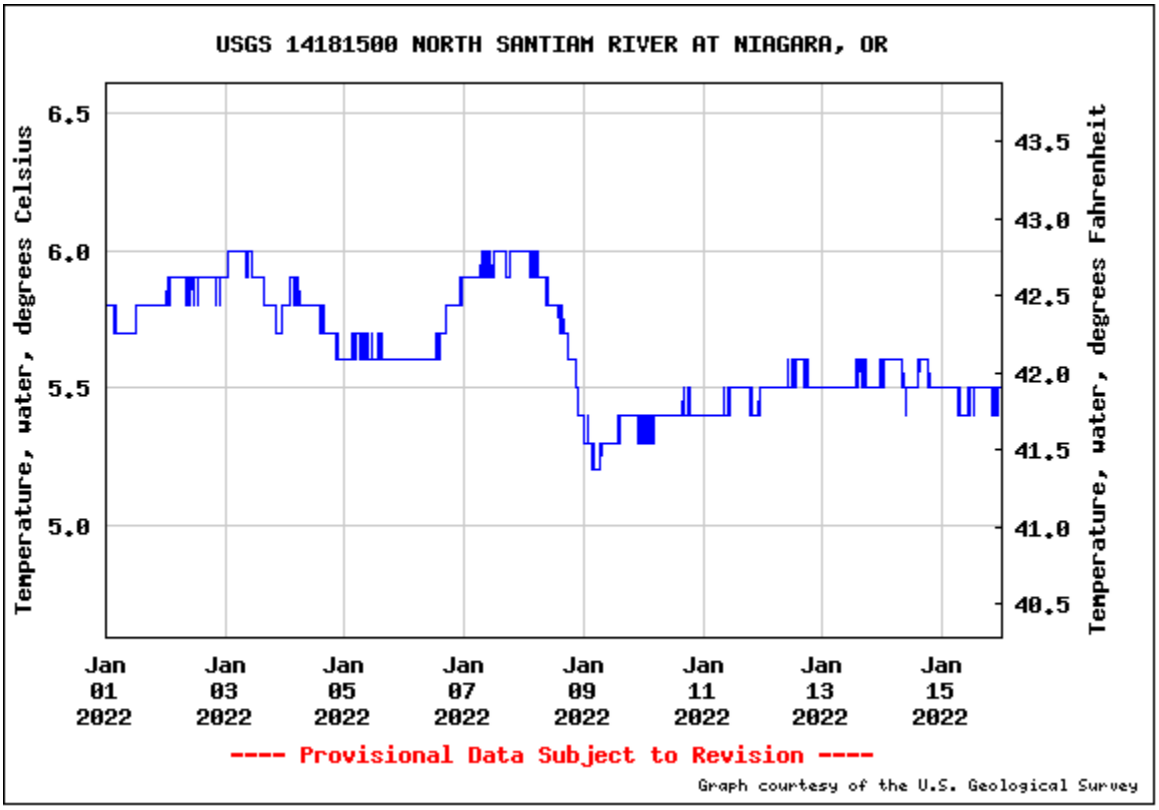


Figure 89. Gage Height (feet); below Big Cliff Dam, North Santiam River



*Data pulled from USGS site due to data logger equipment failure during this period

Figure 20. Temperature at RST (Big Cliff)

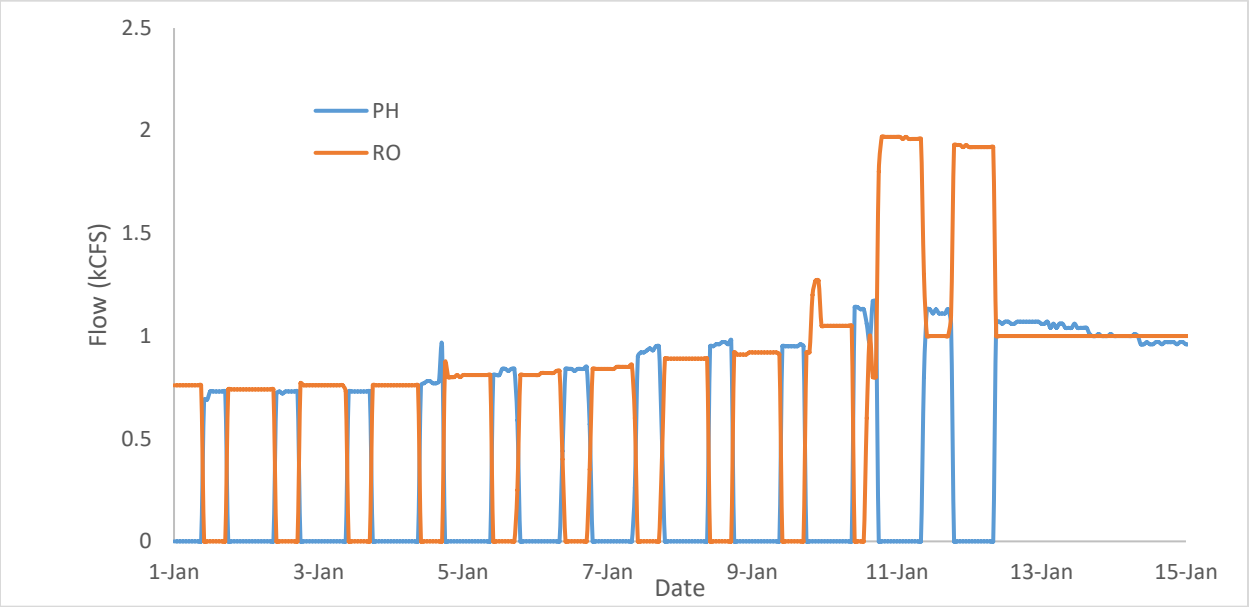


Figure 219. Hourly Flows PWR vs. Spill (Big Cliff)

Middle Fork Willamette – Fall Creek Above Reservoir

Target Species

There were no Chinook salmon (CHS) were captured during the 15-day sampling period. The 8ft trap was brought online at 15:45 on Jan. 14, and the runtime for this report period was 19 hours and 19 minutes. The trap was intended to be operating by Jan. 2 but this was delayed due to inclement weather and high flows. Descriptive statistics for the report period as well as season to date are summarized in Table 16.

Table 16. Descriptive Statistics of Target Species Captured at Fall Creek Above Reservoir, Season To-Date and for the Reporting Period

To-Date											
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*			
					Min	Max	Mean	Min	Max	Mean	
Fall Creek	n/a	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	

January 1-15, 2022											
Site	Route	Species	Life stage	Collected	Length (mm)*			Weight (g)*			
					Min	Max	Mean	Min	Max	Mean	
Fall Creek	n/a	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

There were no target species captured in the Fall Creek trap during this reporting period so there are no injury or copepod data to report yet (Table 17).

Table 17. Number of Descaled and Partially Descaled Chinook Salmon.

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

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

Non-Target Species

A total of 1 non-target fish was captured at Fall Creek during the reporting period; the data is summarized below in Table 18.

Table 18. Summary of Non-target Species (Fall Creek).

Species	8ft Capture	8ft Mortality	Season Total	Season Total Mortality
Bluegill	0	0	0	0
Brook Lamprey	0	0	0	0
Bullhead	0	0	0	0
Bull Trout	0	0	0	0
Crappie	0	0	0	0
Cutthroat Trout	1	0	1	0
Longnose Dace	0	0	0	0
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	0	0
O. mykiss	0	0	0	0
Totals	**1**	**0**	**1**	**0**

Stream Statistics

Basic stream statistics at the Fall Creek site were calculated from data downloaded from the U.S. Geological Survey stream gage number 14150290. During the reporting period, daily maximum values for instantaneous gage height ranged from 3.74 feet to 8.54 feet (mean: 6.07 feet). Figure 22 shows instantaneous gage height.

Stream temperature loggers were not deployed until January 16, so for this report period, temperature data was gathered from USGS stream gage 14150290 and displaying in Figure 23.

Flows during the reporting period averaged 846.6 and 1,159.5 cubic feet per second (cfs) respectively (Figure 24). The average flow of the PWR while the PWR was generating was 725.2cfs and the RO was

721.4cfs. Catch per unit of effort (CPUE) data are summarized in Table 19. Discharge and capture data for the duration of monitoring efforts at this location are provided in Appendix B.

Table 19. Summary of Chinook CPUE, Hills Creek.

	Chinook
Description	**FC(8ft)**
Catch	0
Effort (hrs)	19.32
CPUE (fish/hr)	0

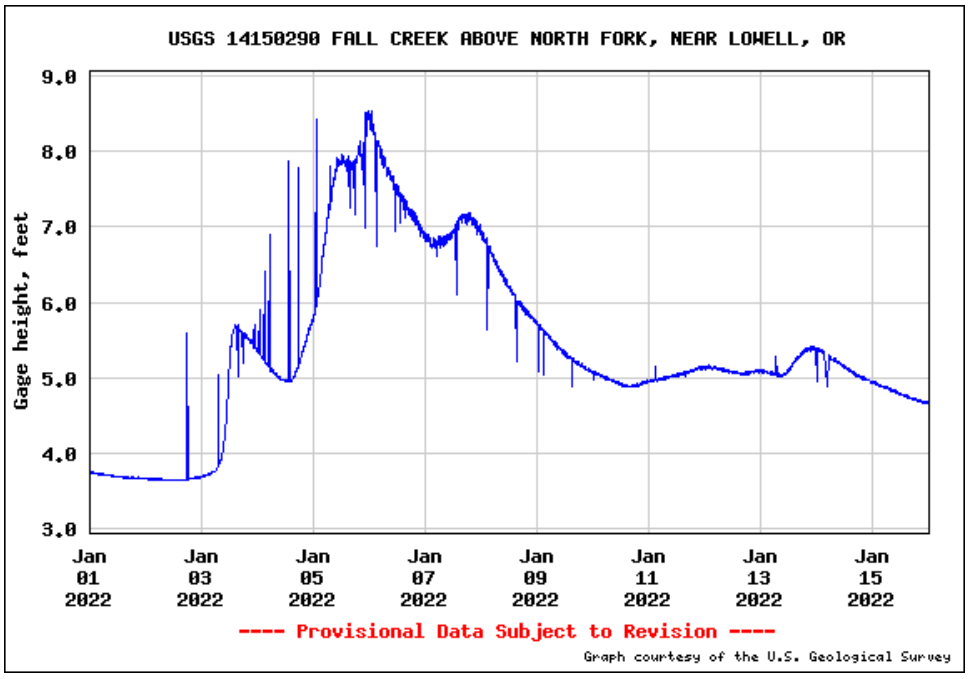


Figure 22. Gage Height (feet); Fall Creek Above North Fork, Near Lowell OR

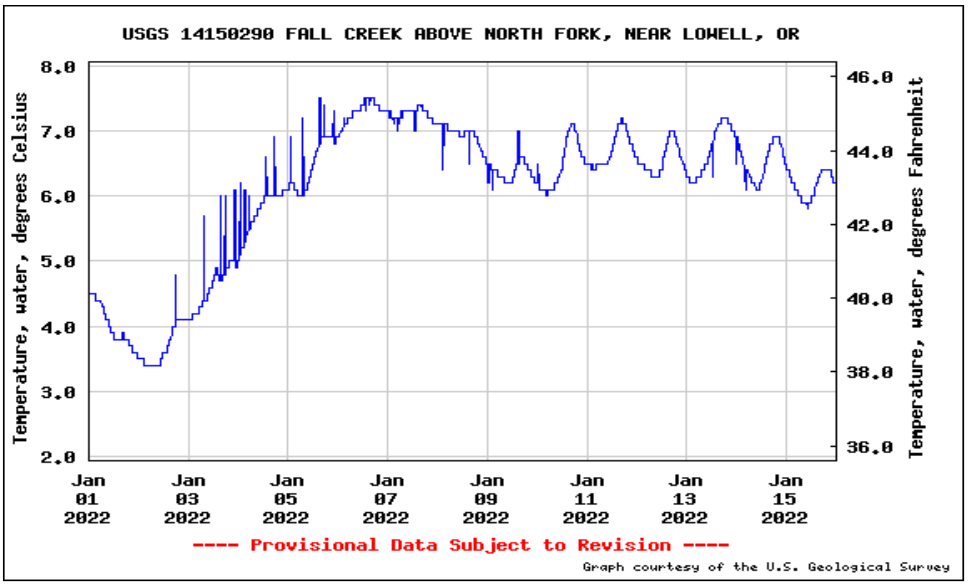


Figure 23. Temperature (Celsius); Fall Creek Above North Fork, Near Lowell OR

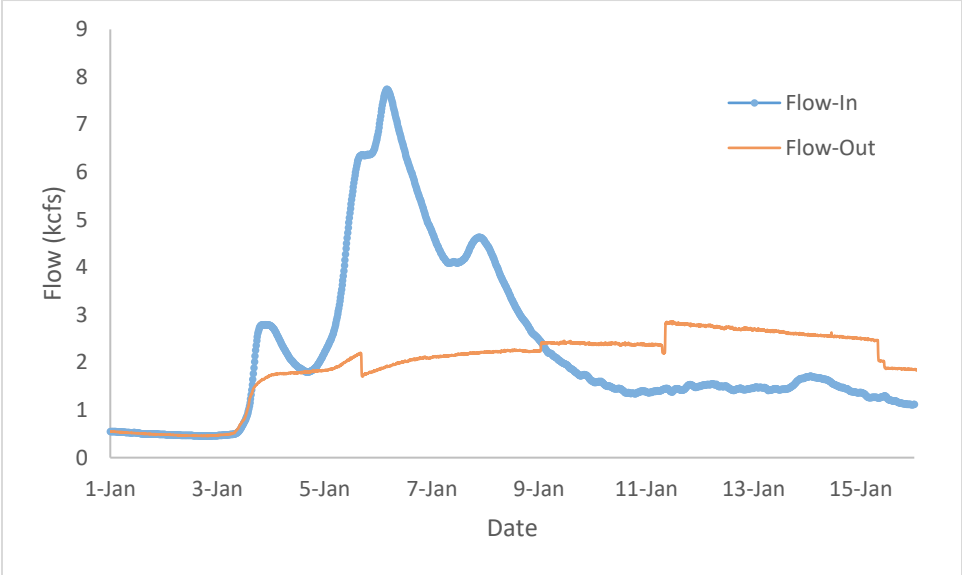


Figure 24. Hourly Flows IN vs OUT (Fall Creek Dam)

Issues Encountered

Due to heavy snow and precipitation at the end of December and into January, installation of the Fall Creek trap was postponed to January 13, 2022.

Upcoming USACE Support Services

None.

Appendix A

Injuries During Reporting Period (1-1-22 to 1-15-22)

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	10		4					7			2								2	1			
8 ft (PH)	10		4					7			2								2	1			
Parr	4							1											1				
Smolt	6		4					6			2								1	1			
Cougar	19		5		2			14	5		2					1	1		1		2		
5 ft (RO)	12		4		1			9	2		1					1			1		1		
Parr	8		4		1			6															
Smolt	4							3	2		1					1			1		1		
8 ft (PH)	7		1		1			5	3		1						1				1		
Parr	4		1		1			2	2		1						1				1		
Smolt	3							3	1														
Hills Creek	14		10		2			10	3		4		1		3	1	2	1	1		2		
5 ft (RO)	5		3					3	1		1				1		1						
Parr	2		1														1						
Smolt	3		2					3	1		1				1								
8 ft (PH)	9		7		2			7	2		3		1		2	1	1	1	1		2		
Smolt	9		7		2			7	2		3		1		2	1	1	1	1		2		

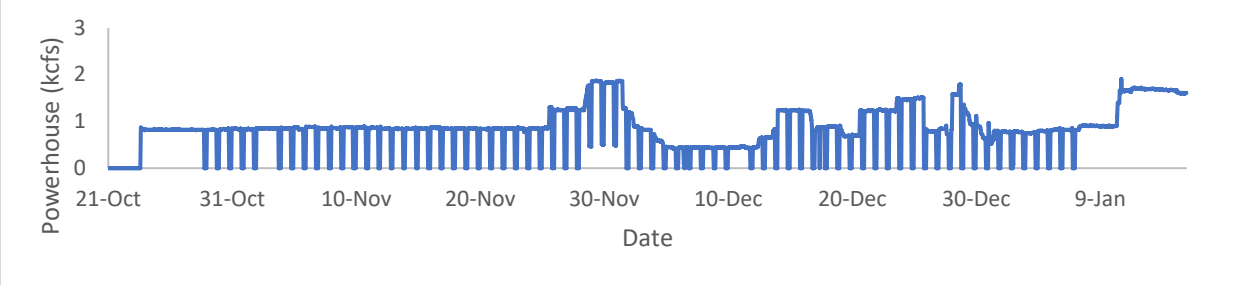
Injuries Since Project Initiation (10-21-21 to 1-15-22)

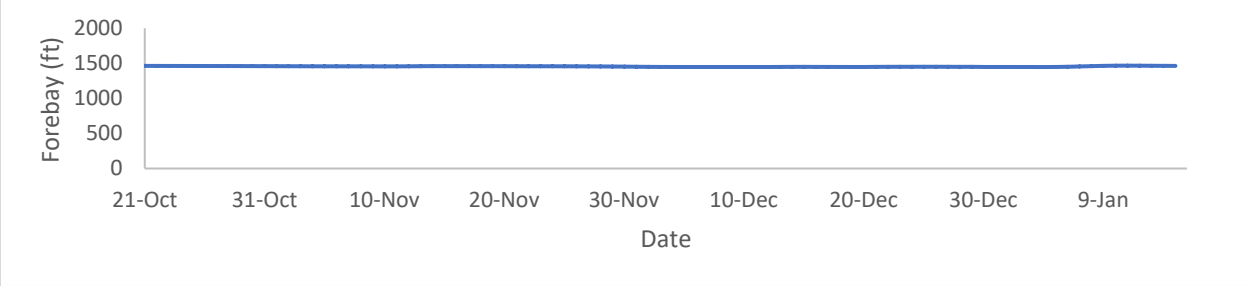
Site/Trap/Life Stage	Total Fish	MUNK	DS<2	BLO	EYB	FUN	BKD	COP	DS>2	PRD	FID	HBO	BO	HO	BVT	HBP	BRU	TEA	OPD	HIN	FVB	POP	GBD
Big Cliff	27		12		2	1		23	2		5	1			1			2	5	1			
8 ft (PH)	27		12		2	1		23	2		5	1			1			2	5	1			
Parr	7		1			1		3			1								1				
Smolt	20		11		2			20	2		4	1			1			2	4	1			
Cougar	43		16		2	1		31	6		6					1	1	1	4	2	2		
5 ft (RO)	21		8		1			14	3		1					1			1	2	1		
Parr	16		7		1			10	1											1			
Smolt	5		1					4	2		1					1			1	1	1		
8 ft (PH)	22		8		1	1		17	3		5						1	1	3		1		
Parr	18		7		1	1		13	2		5						1	1	3		1		
Smolt	4		1					4	1														
Hills Creek	84		49		8			67	27		18		8	1	24	7	4	3	5	2	4		
5 ft (RO)	61		34		4			47	20		11		6		18	6	2	2	4	1	1		
Parr	6		1					1									1						
Smolt	55		33		4			46	20		11		6		18	6	1	2	4	1	1		
8 ft (PH)	23		15		4			20	7		7		2	1	6	1	2	1	1	1	3		
Unknown	1													1									
Smolt	22		15		4			20	7		7		2		6	1	2	1	1	1	3		

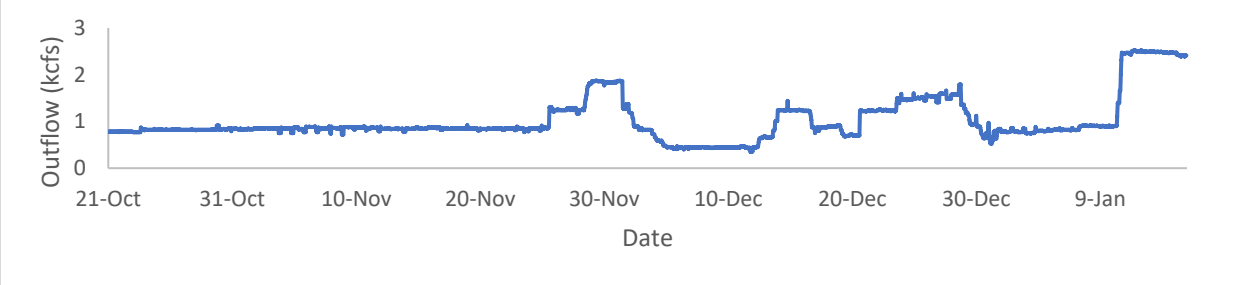
Injury Code	Description of Injury/Condition
NXI	Live fish with no external injuries
MUNK	Mortality with no external injuries
DS<2	Descaling <20%
BLO	Bloated
EYB	Bloody Eye (hemorrhage)
BVT	Bleeding from Vent
FVB	Fin Blood Vessels Broken
GBD	Gas Bubble Disease (fin ray/eye inclusions)
POP	Pop Eye (eye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

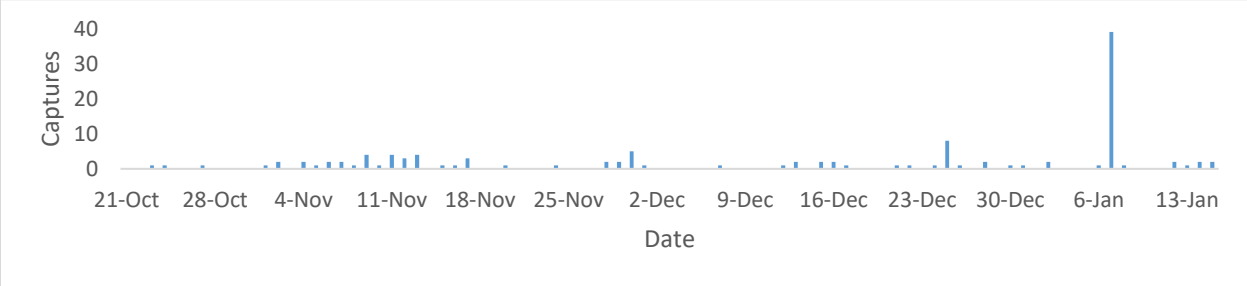
Appendix B

Hills Creek Operational and Capture Data Since Start of Monitoring

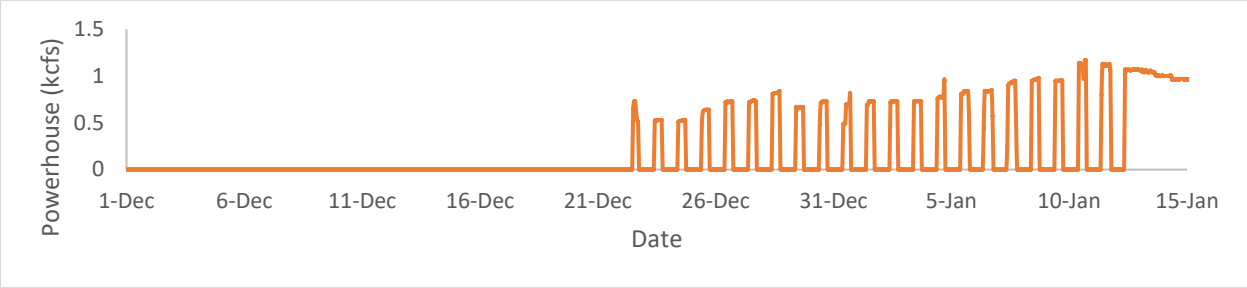


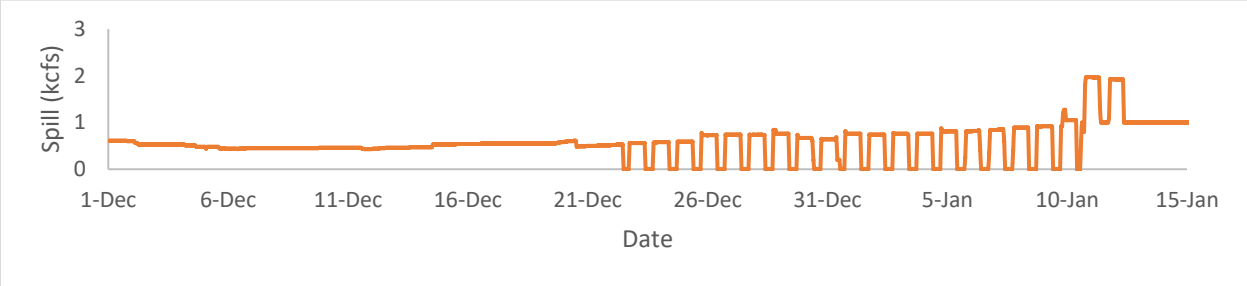


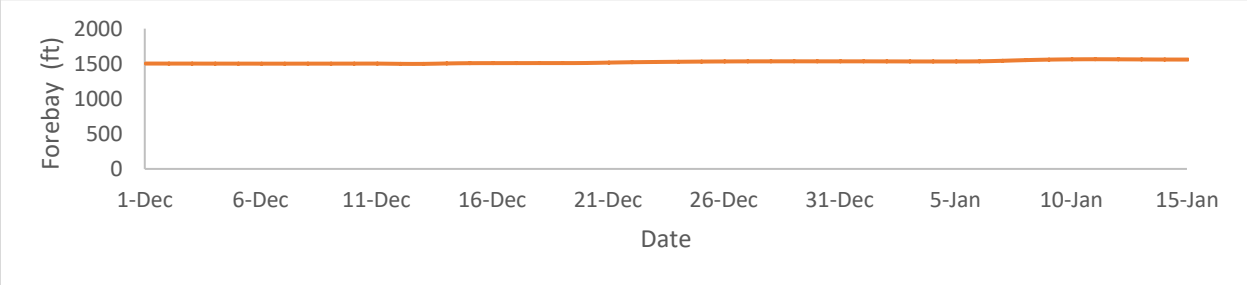


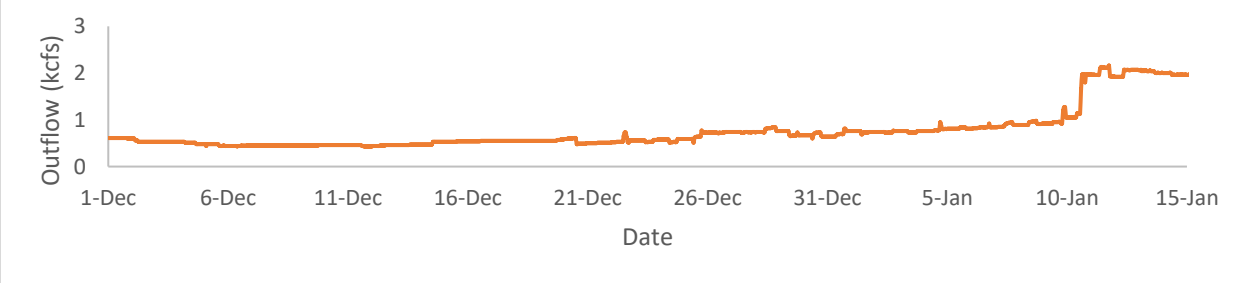


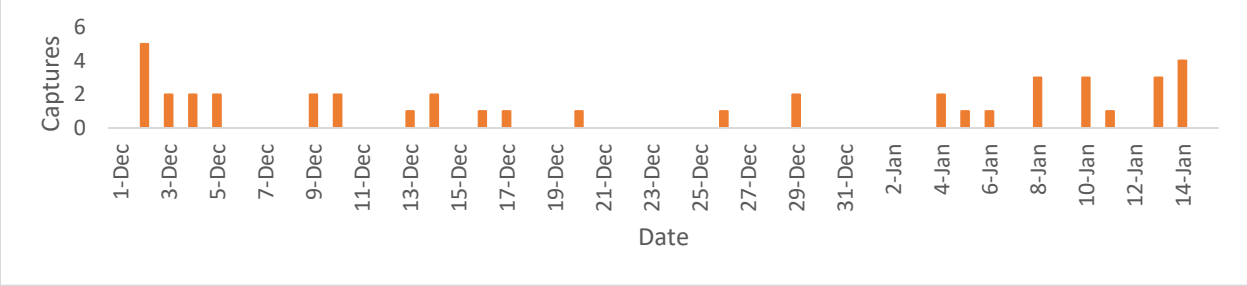
Cougar Dam Operational and Capture Data Since Start of Monitoring



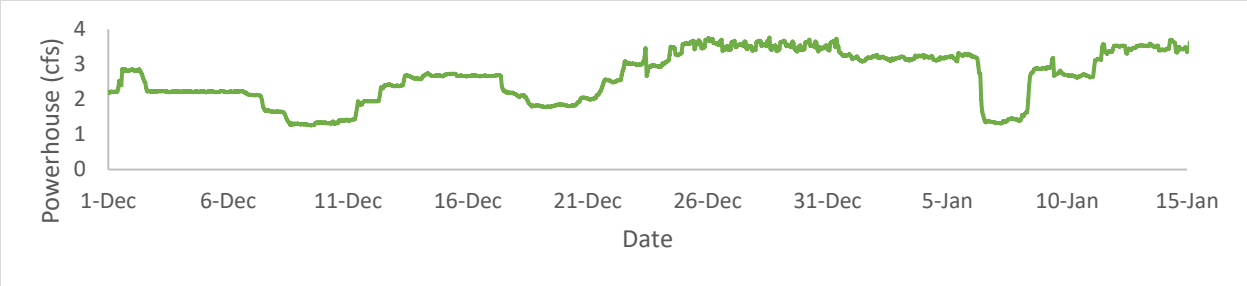


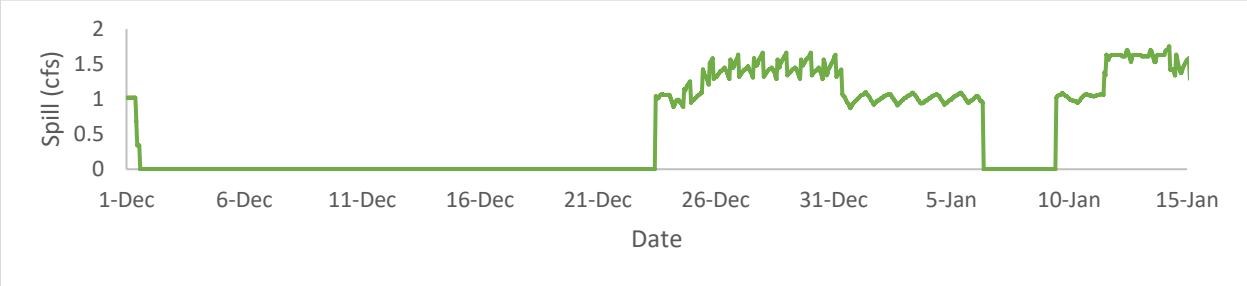


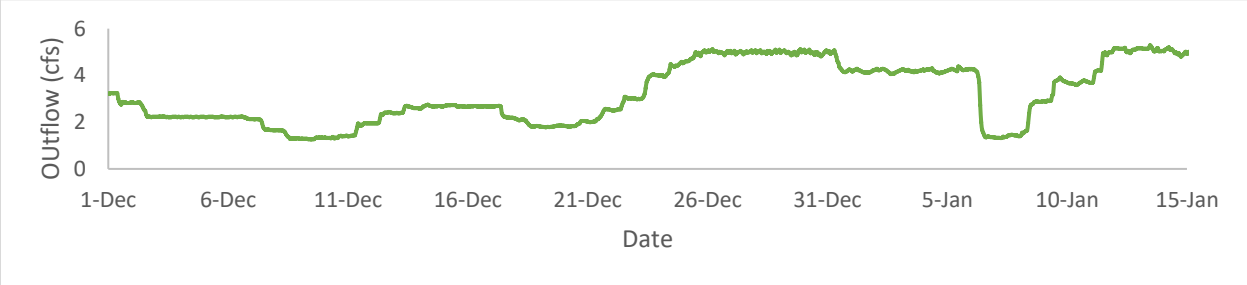


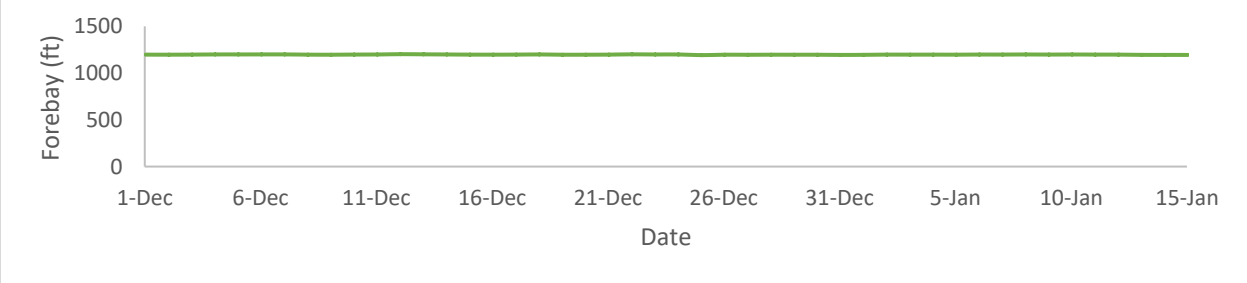


Big Cliff Dam Operational and Capture Data Since Start of Monitoring









Fall Creek Operational and Capture Data Since Start of Monitoring