

WILLAMETTE VALLEY FISH PASSAGE MONITORING VIA ROTARY SCREW TRAPS

Bi-Weekly Report: September 1, 2021 – September 15, 2021



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PROJECT SCHEDULE

Task	Start	End	Days
Fall Creek RST			
Deployment	3/04/21	3/05/21	2
Operation	3/10/21	5/31/21	82
Retrieval	6/2/21*	6/3/2021	1
Cougar Dam RST			
Deployment	2/15/21	2/16/21	2
Operation	3/24/21	11/30/21*	251
Lookout Point RST			
Deployment	3/12/21	3/13/21	2
Operation	3/15/21	07/19/21	126
Big Cliff RST			
Deployment	5/18/21	5/19/21	2
Operation	5/23/21	11/30/21*	191

*Projected date for task to be started/completed.

There are no anticipated changes to the project schedule.

SUMMARY OF ROTARY SCREW TRAP DATA

Rotary screw traps (RSTs) were operated at two locations in the southern Willamette river watershed: on the South Fork McKenzie river below Cougar Dam (Cougar), and on the North Santiam river below Big Cliff dam (Big Cliff). The location of each sampling site is depicted in Figure 1. Sampling began at the Cougar Dam site on 2021 March 24, and at the Big Cliff Dam site on 2021 May 24 (Table 1). Earlier in the year sampling took place above Fall Creek Reservoir near Dolly Varden Campground to trap and transport juvenile Chinook salmon around the Fall Creek Project. Sampling at the Fall Creek site took began on 2021 March 10 and ended on 2021 May 31. Sampling also took place below Lookout Point dam on the Middle Fork Willamette River. Sampling began at Lookout Point on 2021 March 15 and ended on 2021 July 19.

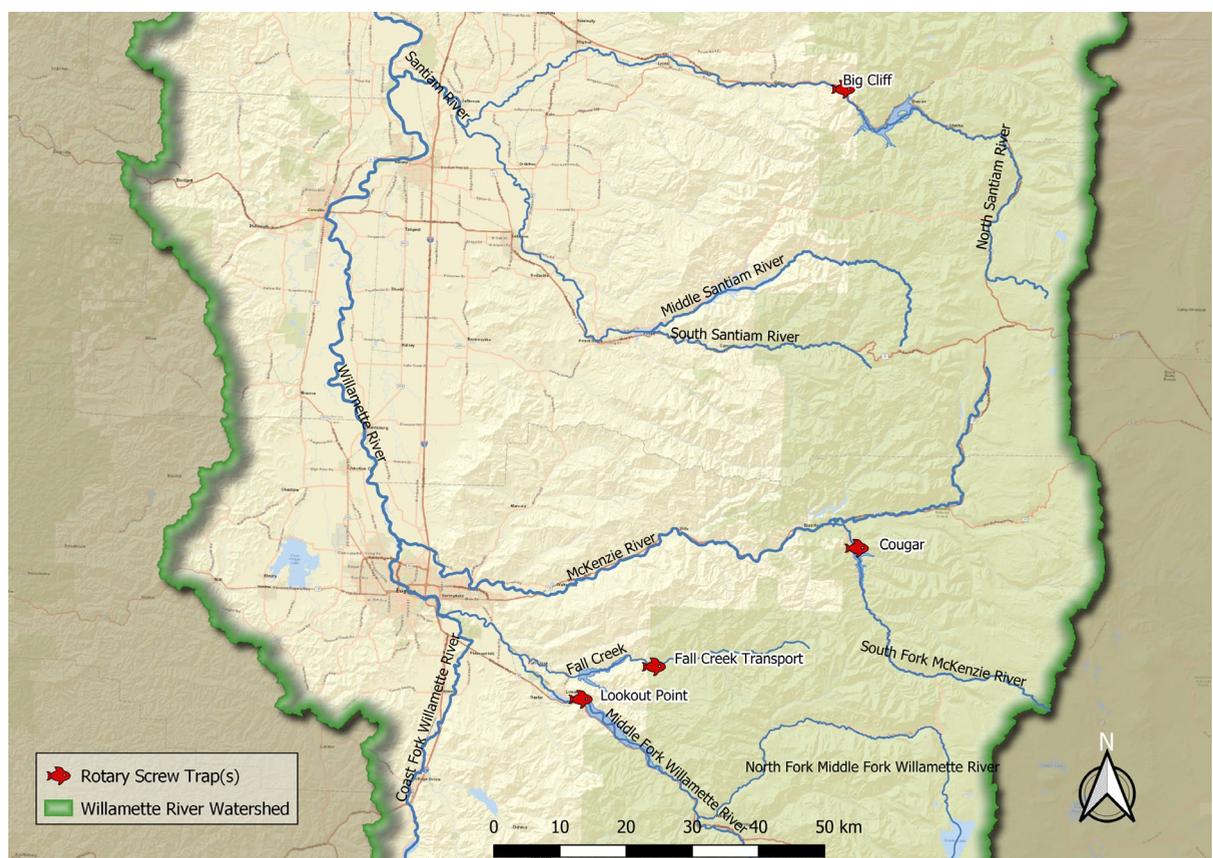


Figure 1: Sampling Locations

Table 1: Sampling Dates

Site	Total Sampling Period Start	Recent Sampling Period Start	Sampling Period End	Recent Days Sampled	Total Days Sampled
BigCliff	2021-05-23	2021-09-01	2021-09-15	14 days	115 days
Cougar	2021-03-24	2021-09-01	2021-09-15	14 days	175 days

Table 2 summarizes the naturally produced Chinook salmon that have been captured and recaptured at each site where rotary screw traps are operating.

Table 2: Willamette Valley Rotary Screw Trap Monitoring catch summary.

Site	Species	Catch (Reporting Period)	Recaptures (Reporting Period)	Total Catch	Total Recaptures
BigCliff	CHS	10	0	501	33
Cougar	CHS	114	4	384	8

Table 3 summarizes trap efficiency trials that have been conducted with releases of ODFW hatchery reared Chinook salmon.

Table 3: Results of trap efficiency trials conducted with ODFW hatchery reared Chinook salmon.

Date	Site	Species	Mean Length (mm)	Released	Recaptured	Efficiency (%)
2021-05-05	Cougar	HCHS	62.5	105	37	35.2
2021-04-08	LOP	HCHS	165.0	993	3	0.3
2021-05-26	BIG	HCHS	159.0	543	8	1.5
2021-07-09	BIG	HCHS	66.0	454	21	4.6
2021-07-13	LOP	HCHS	90.4	950	1	0.1

South Fork McKenzie - Cougar Dam

Target Species

Sampling below Cougar dam from 2021-09-01 to 2021-09-15 (14 days) resulted in the capture of 113 juvenile Chinook salmon and one adult Chinook. The adult was released immediately upon checking the trap. Table 4 summarizes the catch of juvenile Chinook salmon at the Cougar site. Figure 2 illustrates the length distribution of juvenile Chinook salmon caught at the Cougar site to date.

Table 4: Descriptive statistics of target species captured at the Cougar dam site.

Site	Species	Life Stage	n	Lengths (mm)				Weights (g)			
				Min	Max	Mean	S.D.	Min	Max	Mean	S.D.
Cougar (Reporting Period)		ADULT	1					Inf	-Inf		
		PARR	28	61	105	85.8	10.1	2.6	13.5	7.0	2.4
		SMOLT	85	92	210	128.1	23.5	8.2	103.2	24.1	16.8
Cougar (Total)	CHS	ADULT	3					Inf	-Inf		
		FRY	64	33	57	39.8	6.7	1.5	1.5	1.5	
		PARR	128	48	177	86.5	16.1	1.5	54.1	8.4	5.3
		SMOLT	189	84	210	128.2	22.5	5.6	103.2	24.2	14.6

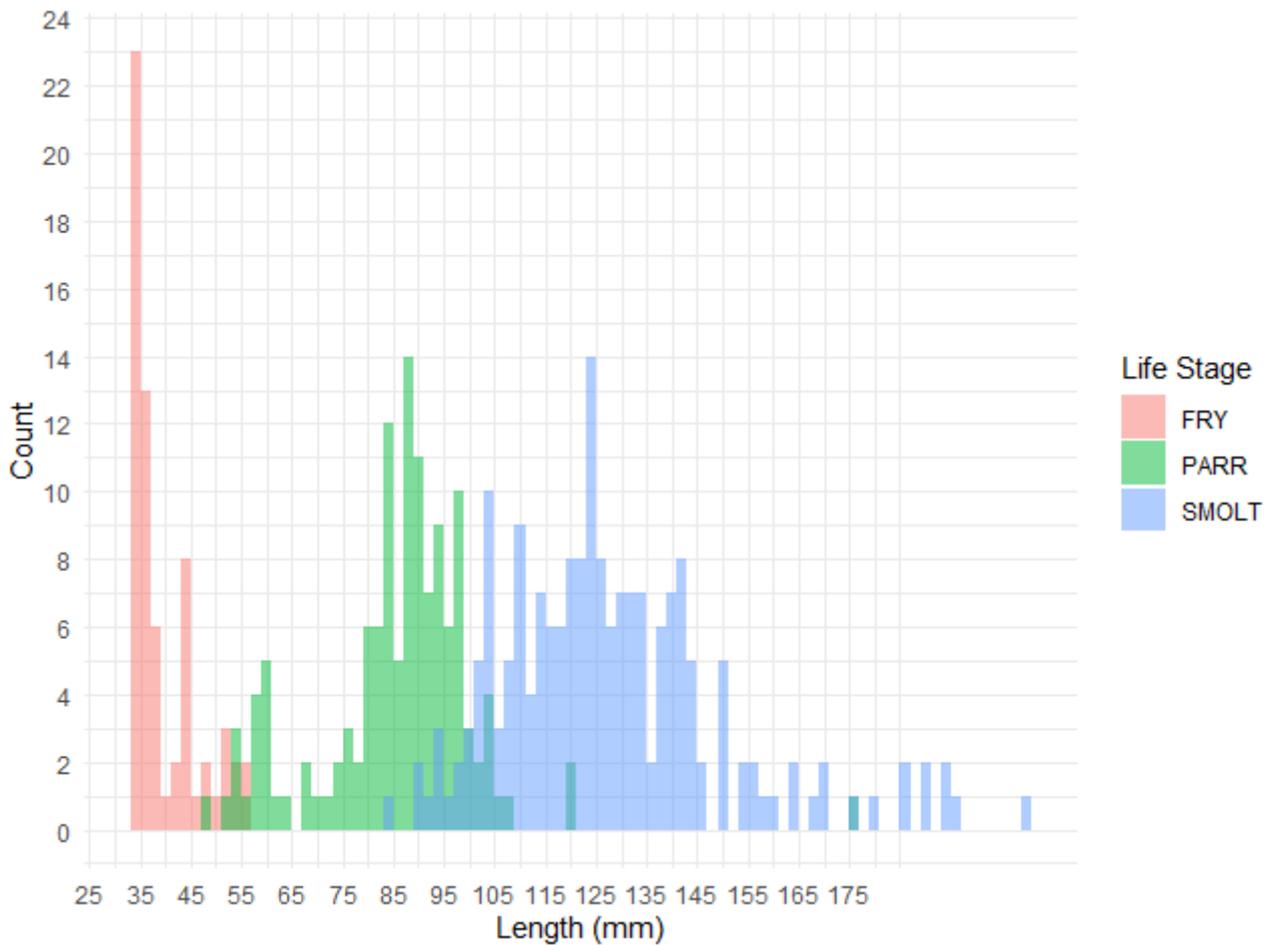


Figure 2: Length of juvenile Chinook salmon captured at the Cougar Dam site.

Dam Operations and Trap Effort

Dam operations data were downloaded from the USACE Dataquery 2.0 website. Powerhouse and spill data were not available for the entire reporting period when we downloaded them on 16 September 2021. Table 5 presents the range of total discharge (outflow), powerhouse discharge, spill discharge and forebay elevation for the Cougar Dam project during the current two-week reporting period. Forebay elevation, outflow, powerhouse discharge and spill discharge are plotted along with daily catch of juvenile Chinook salmon and trapping effort in Figure 3. Trapping effort was calculated as cone rotations since the trap was last checked divided by the number of minutes expired since the trap was last checked.

Table 5: Range of total outflow (cfs), powerhouse discharge (cfs), spill discharge (cfs) and forebay elevation (ft) at Cougar dam during the current reporting period. PH, SP, and FB stand for powerhouse, spill and forebay elevation, respectively.

Site	outflow_min	outflow_max	PH_min	PH_max	SP_min	SP_max	FB_min	FB_max
Cougar	660	780	0	710	0	780	1,568.59	1,586.17

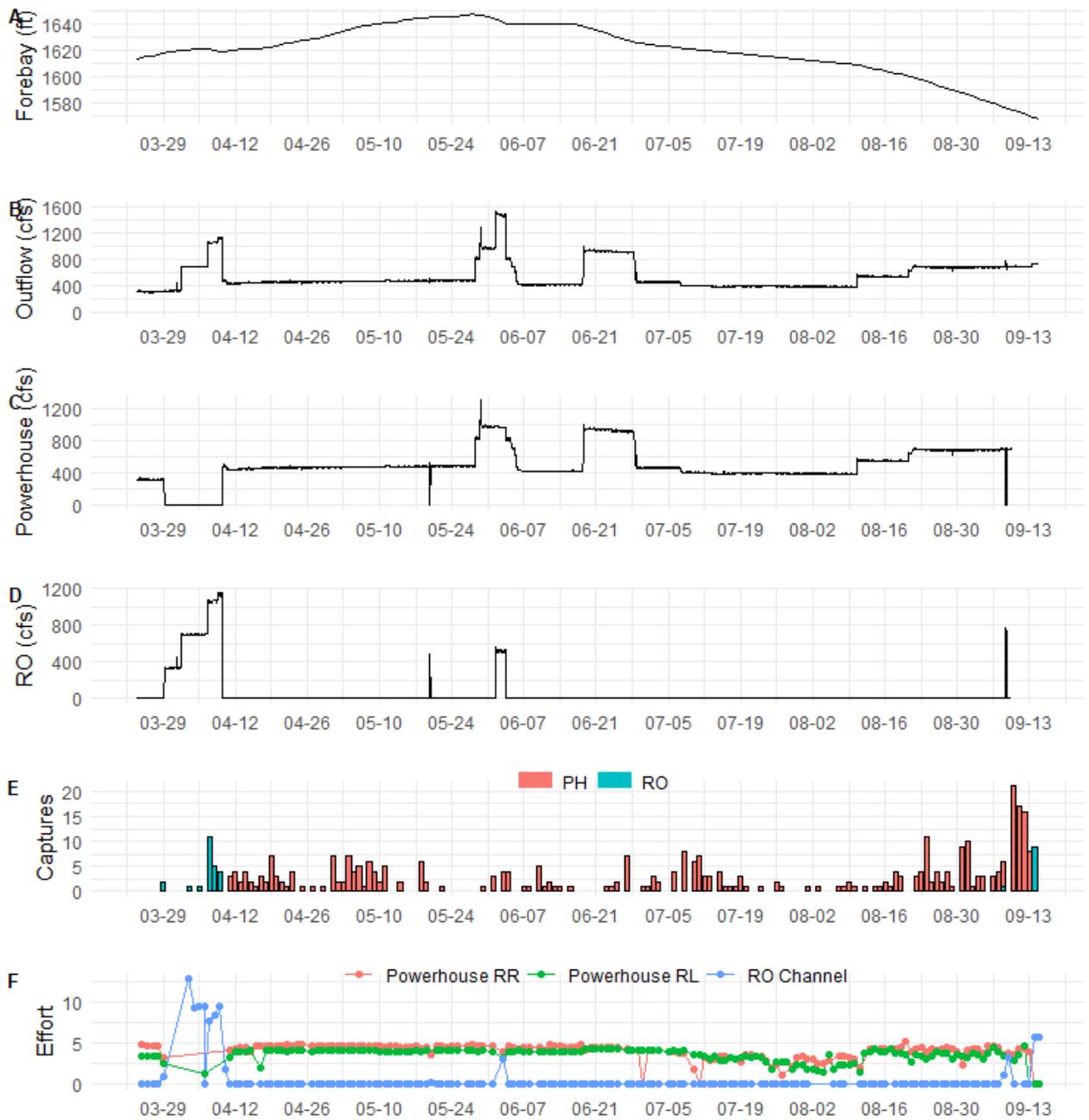


Figure 3: Forebay elevation (panel A), total outflow (panel B), powerhouse flow (panel C), spill (panel D), captured Chinook salmon (panel E), and trapping effort (panel F) below Cougar Dam. Trapping effort is calculated as trap revolutions divided by the number of minutes elapsed since the trap was last checked. RL and RR stand for river left and river right, respectively.

Injuries and Copepod Infection

Table 6 summarizes the type and number of injuries observed at the Cougar site.

Table 6: Injuries sustained by juvenile Chinook salmon captured at the Cougar site. DS<20 = descaling less than 20%, DS>20 = descaling greater than 20%, COP = copepods, EYB = bloody eye, FID = fin damage, OPD = opercle damage, POP = pop eye, TEA = body injury (tears, scrapes, etc.)

Site	Species	Life Stage	Injury Code	Reporting Period Injuries	Total Injuries
		FRY	TEA	0	2
			COP	11	30
			DS<20	4	4
			EYB	1	2
		PARR	FID	1	3
			FUN	1	1
			HBP	1	1
			MORT	1	2
			TEA	1	3
Cougar	CHS		COP	76	144
			DS<20	7	19
			MORT	6	8
			DS>20	5	6
		SMOLT	BVT	1	1
			EYB	1	3
			FID	1	3
			OPD	1	2
			TEA	1	2
			POP	0	1

Table 7 summarizes copepod infestation of juvenile Chinook salmon captured at the Cougar Dam site.

Table 7: Copepod infestation sustained by target species captured at the Cougar site.

Site	Species	Reporting Period					Overall				
		Infections	Rate	Min_Cope	Max_Cope	Mean_Cope	Infections	Rate	Min_Cope	Max_Cope	Mean_Cope
Cougar	CHS	83	0.73	1	15	3.78	177	0.46	1	23	3.41

Non-Target Species

Non-target species that have been captured at the Cougar Dam site are summarized in Table 8.

Table 8: Non-target species captured at the Cougar site. BLG = bluegill, COT = sculpin, CUT = cutthroat trout, LSS = large-scale sucker, LND = long nose dace, MWF = mountain whitefish, RBT = rainbow trout, SMB = smallmouth bass, Newt = rough-skinned newt.

Site	Species	Reporting Period Catch	Total Catch
Cougar	LSS	16	452
	COT	4	132
	RBT	1	76
	LND	0	54
	CUT	0	35
	MWF	1	18
	BLG	1	4
	SMB	0	4
	LMB	0	2
	Newt	0	1

North Santiam - Big Cliff Dam

Target Species

Sampling below Big Cliff dam from 2021-09-01 to 2021-09-15 (14 days) resulted in the capture of 10 juvenile Chinook salmon. Table 9 summarizes the catch of juvenile Chinook salmon at the Big Cliff site. Figure 4 illustrates the length distribution of juvenile Chinook salmon captured at the Big Cliff site to date.

Table 9: Descriptive statistics of target species captured at the Big Cliff dam site.

Site	Species	Life Stage	n	Lengths (mm)				Weights (g)			
				Min	Max	Mean	S.D.	Min	Max	Mean	S.D.
Big Cliff (Reporting Period)	CHS	SMOLT	10	105	149	136.9	13.8	28.1	37.6	31.5	3.9
	CHS	FRY	1	43	43	43.0		Inf	-Inf		
Big Cliff (Total)	CHS	PARR	9	56	99	80.7	15.1	3.2	11.3	7.6	2.5
	CHS	SMOLT	491	70	305	132.6	25.8	3.8	201.0	27.5	19.5

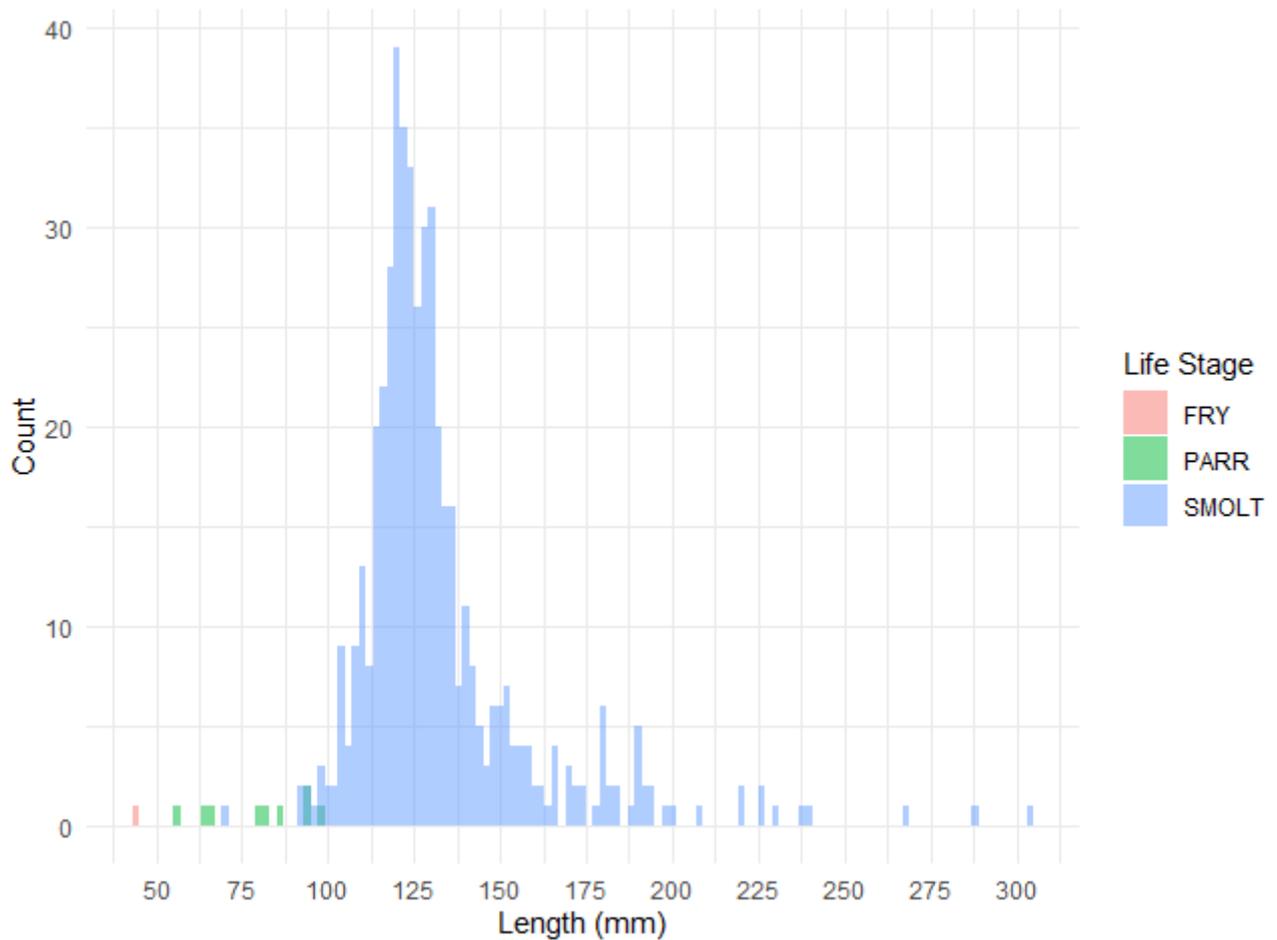


Figure 4: Length distribution of juvenile Chinook salmon captured at the Big Cliff Dam site.

Dam Operations and Trap Effort

Dam operations data were downloaded from the USACE Dataquery 2.0 website. Powerhouse and spill data were not available for the entire reporting period when we downloaded them on 16 September 2021. Table 10 presents the range of total discharge (outflow), powerhouse discharge, spill discharge and forebay elevation for the Big Cliff dam project during the current two-week reporting period. Forebay elevation, outflow, powerhouse discharge and spill discharge are plotted along with daily catch of juvenile Chinook salmon and trapping effort in Figure 5. Trapping effort was calculated as cone rotations since the trap was last checked divided by the number of minutes expired since the trap was last checked. Table 11 and Figure 6 present dam operations for Detroit along with catch and effort below Big Cliff.

Table 10: Range of total outflow (cfs), powerhouse discharge (cfs), spill discharge (cfs) and forebay elevation (ft) at Big Cliff dam during the current reporting period. PH, SP, and FB stand for powerhouse, spill and forebay elevation, respectively.

Site	outflow_min	outflow_max	PH_min	PH_max	SP_min	SP_max	FB_min	FB_max
Big Cliff	1,240	1,630	1,240	1,630	0	0	1,195.81	1,198.56

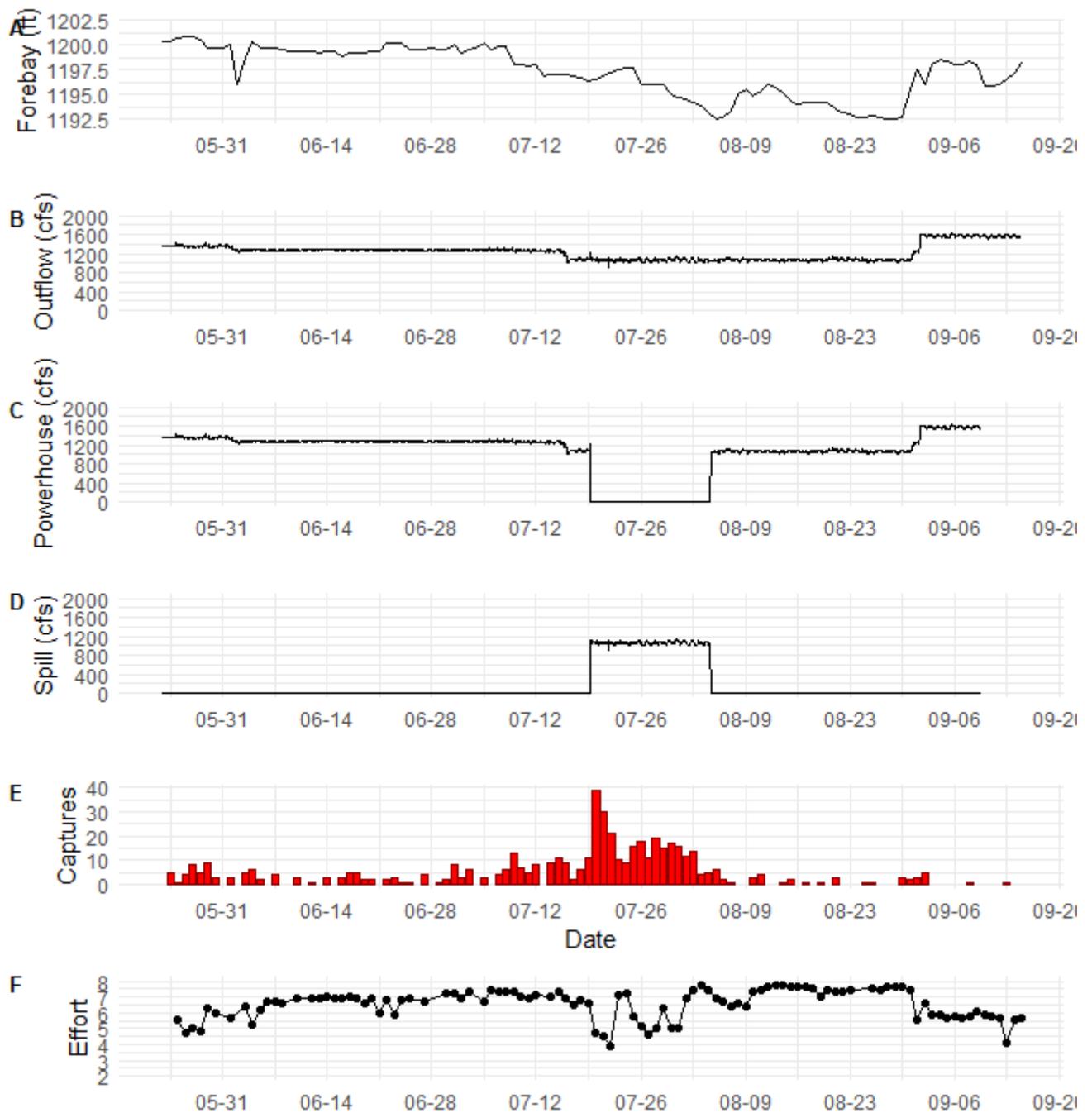


Figure 5: Forebay elevation (panel A), total outflow (panel B), powerhouse flow (panel C), spill (panel D), captured Chinook salmon (panel E), and trapping effort (panel F) below Big Cliff Dam. Trapping effort is calculated as trap revolutions divided by the number of minutes elapsed since the trap was last checked. RL and RR stand for river left and river right, respectively.

Table 11: Range of total outflow (cfs), powerhouse discharge (cfs), spill discharge (cfs) and forebay elevation (ft) at Detroit dam during the current reporting period. PH, SP, and FB stand for powerhouse, spill and forebay elevation, respectively.

Site	outflow_min	outflow_max	PH_min	PH_max	SP_min	SP_max	FB_min	FB_max
Detroit	0	3,670	0	2,650	0	1,070	1,511.16	1,521.67

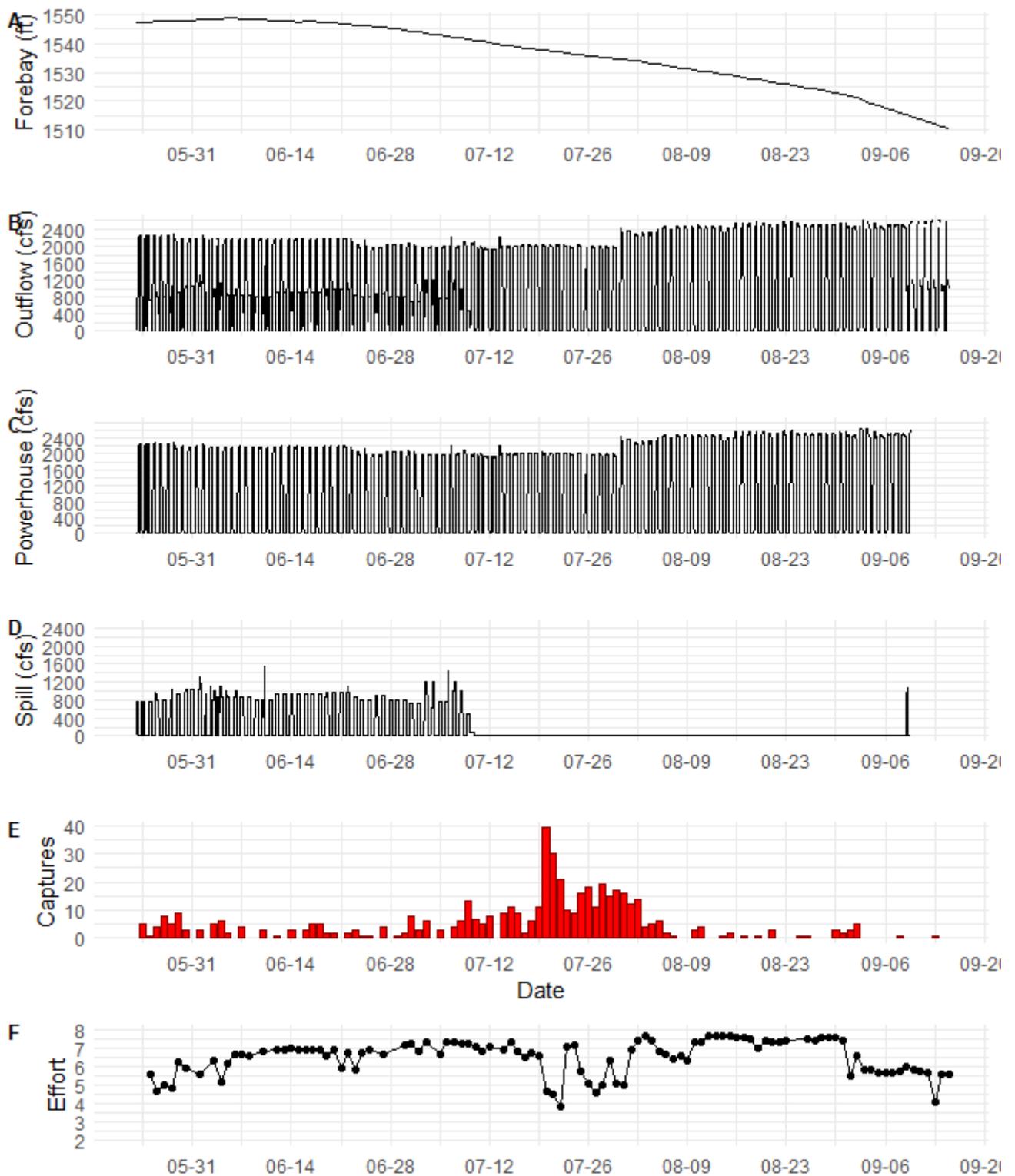


Figure 6: Forebay elevation (panel A), total outflow (panel B), powerhouse flow (panel C), and spill (panel D) at Detroit dam along with juvenile Chinook salmon catch (panel E) and trapping effort (panel F) below Big Cliff Dam. Trapping effort is calculated as trap revolutions divided by the number of minutes elapsed since the trap was last checked. RL and RR stand for river left and river right, respectively.

Injuries and Copepod Infection

Table 12 summarizes the type and number of injuries observed at the Big Cliff site.

Table 12: Injuries sustained by target species captured at the Big Cliff site. BO = body only, COP = copepods, DS<20 = descaling less than 20%, DS>20 = descaling greater than 20%, EYB = bloody eye, FID = fin damage, OPD = opercle damage, POP = pop eye, TEA = body injury (tears, scrapes, etc.)

Site	Species	Life Stage	Injury Code	Reporting Period Injuries	Total Injuries
BigCliff	CHS	PARR	DS>20	0	1
			COP	3	400
			MORT	3	28
			BO	1	4
			PRD	1	1
		SMOLT	DS<20	0	47
			DS>20	0	8
			EYB	0	10
			FID	0	4
			OPD	0	4
			POP	0	3
			TEA	0	9

Table 13 summarizes copepod infestation of juvenile Chinook salmon captured at the Cougar Dam site.

Table 13: Copepod infestation sustained by target species captured at the Big Cliff site.

Site	Species	Reporting Period					Overall				
		Infections	Rate	Min_Cope	Max_Cope	Mean_Cope	Infections	Rate	Min_Cope	Max_Cope	Mean_Cope
BigCliff	CHS	5	0.5	1	6	3.17	403	0.8	1	23	3.42

Non-Target Species

Table 14 summarizes the catch of non-target species at the Big Cliff site.

Table 14: Non-target species captured at the Big Cliff site. BLG = Bluegill, COT = Sculpin spp., HRBT = hatchery rainbow trout, KOK = kokanee, PKS = pumpkinseed, RBT = rainbow trout

Site	Species	Reporting Period Catch	Total Catch
BigCliff	RBT	4	86
	BLG	9	23
	HRBT	0	3
	KOK	0	3
	COT	0	2
	PKS	0	2

Issues Encountered

None.

Upcoming USACE Support Services

None.