

WILLAMETTE VALLEY FISH PASSAGE MONITORING – BULK MARKING & RESERVOIR DISTRIBUTION

Bi-Weekly Report: September 16, 2023 – September 30, 2023



Prepared for: United States Army Corps of Engineers

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BULK MARKING SCHEDULE

Table 1. Tentative release schedule for brood year 2022. Green rows highlight the release groups that have been tagged and released so far this year. Orange rows highlight release groups that have been tagged but have not yet been released.

Release Year	Release Date (estimated)	Release Basin	Release Area	Release Location	Life stage	N
2023	February	North Santiam	Detroit Reservoir	Breitenbush River	fry	3750
2023	February	North Santiam	Detroit Reservoir	North Santiam River	fry	3750
2023	March	MF Willamette	Fall Creek Reservoir	Head of Reservoir	fry	5000
2023	March	MF Willamette	Lookout Point Reservoir	Head of Reservoir	fry	5000
2023	March	MF Willamette	Hills Creek Reservoir	Head of Reservoir	fry	5000
2023	March	SF McKenzie	Cougar Reservoir	Head of Reservoir	fry	5000
2023	March	SF McKenzie	Cougar Reservoir	Head of Reservoir	fry	5000
2023	March	MF Willamette	Fall Creek Reservoir	Head of Reservoir	fry	5000
2023	April	MF Willamette	Lookout Point Reservoir	Head of Reservoir	fry	5000
2023	April	North Santiam	Detroit Reservoir	Breitenbush River	fry	3750
2023	April	North Santiam	Detroit Reservoir	North Santiam River	fry	3750
2023	April	South Santiam	Green Peter Reservoir	Head of Middle Santiam Arm	fry	2500
2023	April	South Santiam	Green Peter Reservoir	Head of Quartzville Creek Arm	fry	2500
2023	April	MF Willamette	Hills Creek Reservoir	Head of Reservoir	fry	5000
2023	April	South Santiam	Green Peter Reservoir	Head of Middle Santiam Arm	fry	2500
2023	April	South Santiam	Green Peter Reservoir	Head of Quartzville Creek Arm	fry	2500
2023	August	South Santiam	Foster Reservoir	Tailrace	sub-yearling	1000
2023	August	South Santiam	Foster Reservoir	Head of Reservoir	sub-yearling	2000
2023	September	MF Willamette	Dexter Reservoir	Tailrace	sub-yearling	2000
2023	September	MF Willamette	Lookout Point Reservoir	Head of Reservoir	sub-yearling	5000
2023	September	MF Willamette	Lookout Point Reservoir	Forebay	sub-yearling	5000
2023	September	SF McKenzie	Cougar Reservoir	Head of Reservoir	sub-yearling	3000
2023	September	South Santiam	Green Peter Reservoir	Head of Middle Santiam Arm	sub-yearling	2500
2023	September	South Santiam	Green Peter Reservoir	Head of Quartzville Creek Arm	sub-yearling	2500
2023	October	North Santiam	Big Cliff Reservoir	Big Cliff Reservoir Tailrace	sub-yearling	8000
2023	October	North Santiam	Detroit Reservoir	Breitenbush River	sub-yearling	5000
2023	October	North Santiam	Detroit Reservoir	North Santiam River	sub-yearling	5000
2023	October	MF Willamette	Fall Creek Reservoir	Head of Reservoir	sub-yearling	5000
2023	October	MF Willamette	Fall Creek Reservoir	Tailrace	sub-yearling	1000
2023	October	SF McKenzie	Cougar Reservoir	Forebay	sub-yearling	5000
2023	October	SF McKenzie	Cougar Reservoir	Tailrace	sub-yearling	4000
2023	October	SF McKenzie	Cougar Reservoir	Head of Reservoir	sub-yearling	4000
2023	October	South Santiam	Green Peter Reservoir	Tailrace	sub-yearling	4000
2023	October	South Santiam	Green Peter Reservoir	Head of Middle Santiam Arm	sub-yearling	2500
2023	October	South Santiam	Green Peter Reservoir	Head of Quartzville Creek Arm	sub-yearling	2500
2023	October	South Santiam	Foster Reservoir	Tailrace	sub-yearling	4000
2023	October	South Santiam	Foster Reservoir	Head of Reservoir	sub-yearling	5000

Release Year	Release Date (estimated)	Release Basin	Release Area	Release Location	Life stage	N
2023	November	MF Willamette	Fall Creek Reservoir	Head of Reservoir	sub-yearling	5000
2023	November	MF Willamette	Fall Creek Reservoir	Tailrace	sub-yearling	1000
2023	November	North Santiam	Big Cliff Reservoir	Tailrace	sub-yearling	6000
2023	November	SF McKenzie	Cougar Reservoir	Forebay	sub-yearling	5000
2023	November	SF McKenzie	Cougar Reservoir	Tailrace	sub-yearling	4000
2023	November	SF McKenzie	Cougar Reservoir	Head of Reservoir	sub-yearling	4000
2023	November	MF Willamette	Hills Creek Reservoir	Head of Reservoir	sub-yearling	5000
2023	November	MF Willamette	Hills Creek Reservoir	Tailrace	sub-yearling	3000
2023	November	MF Willamette	Hills Creek Reservoir	Forebay or Mid Reservoir	sub-yearling	5000
2024	February	MF Willamette	Hills Creek Reservoir	Head of Reservoir	yearling	5000
2024	February	MF Willamette	Hills Creek Reservoir	Tailrace	yearling	3000
2024	February	MF Willamette	Hills Creek Reservoir	Forebay or Mid Reservoir	yearling	5000
2024	February	MF Willamette	Fall Creek Reservoir	Head of Reservoir	yearling	5000
2024	February	MF Willamette	Fall Creek Reservoir	Tailrace	yearling	1000
2024	March	MF Willamette	Lookout Point Reservoir	Head of Reservoir	yearling	5000
2024	March	MF Willamette	Dexter Reservoir	Tailrace	yearling	2000
2024	March	MF Willamette	Lookout Point Reservoir	Forebay	yearling	5000
2024	February	SF McKenzie	Cougar Reservoir	Forebay	yearling	2000
2024	February	SF McKenzie	Cougar Reservoir	Tailrace	yearling	1000
2024	February	SF McKenzie	Cougar Reservoir	Head of Reservoir	yearling	2000
2024	March	SF McKenzie	Cougar Reservoir	Forebay	yearling	2000
2024	March	SF McKenzie	Cougar Reservoir	Tailrace	yearling	1000
2024	March	SF McKenzie	Cougar Reservoir	Head of Reservoir	yearling	2000
2024	March	MF Willamette	Fall Creek Reservoir	Head of Reservoir	yearling	5000
2024	March	MF Willamette	Fall Creek Reservoir	Tailrace	yearling	1000
2024	March	MF Willamette	Lookout Point Reservoir	Head of Reservoir	yearling	5000
2024	March	MF Willamette	Dexter Reservoir	Tailrace	yearling	2000
2024	March	MF Willamette	Lookout Point Reservoir	Forebay	yearling	5000
2024	April	North Santiam	Big Cliff Reservoir	Tailrace	yearling	2000
2024	April	North Santiam	Detroit Reservoir	Breitenbush River	yearling	2000
2024	April	North Santiam	Detroit Reservoir	North Santiam River	yearling	2000

BULK MARKING SUMMARY

A total of 10 groups of PIT tagged juvenile Chinook salmon were released during this reporting period (Table 3). The first set of three releases were for Lookout Point reservoir to target the fall drawdown operations. 5,000 fish were released at the head of reservoir (Black Canyon boat ramp), 5,004 were released at Signal Point boat ramp (Lookout Reservoir “forebay”), and 2,011 were released into the Lookout Point tailrace at Pengra boat ramp. The next two releases were at Green Peter head of reservoir with 2,518 fish released into Quartzville Creek and 2,508 fish released into the Middle Santiam River prior to target fall operations. Next, we went over to the North Santiam basin and released three groups of fish, 5,002 into the Breitenbush, 4,999 into the North Santiam River above Detroit, and 8,009 into the Big Cliff tailrace. Lastly, we released 5,006 into

Fall Creek head of reservoir and the 1,001 into Fall Creek Dam's tailrace to target the start of Fall Creek fall operations and to coincide with screw trap operations beginning in the Fall Creek tailrace.

Recaptures

There were 15 new recaptures of PIT tagged juvenile Chinook salmon during this reporting period. Of those, 12 were recaptured in the Hills Creek Tailrace rotary screw traps (11 in the powerhouse trap and 1 in the regulating outlet trap). Dam operations data from DataQuery2.0 were unavailable at the time of reporting, but the data visualizations provided by the Willamette Valley teacups suggest that there was a spike of inflow into Hills Creek during this period. There have been 20 recaptures of PIT tagged fish so far this year (Table 4). In addition to recaptures below Hills Creek, we had two recaptures in Lookout Point reservoir via gill net sampling and a single recapture in the Dexter Dam tailrace (Table 4).

Table 2. Bulk marking summary statistics. Total number of fish marked (N), mean fork length (FL), mean weight, start date of marking, end date of marking, total mortalities from start of tagging to release, mortality percentage, total shed tags from start of tagging to release, and shed tag percentage.

Mark Group	N	Mean FL (mm)	Mean Weight (g)	Date Start	Date End	Morts	Mort. %	Sheds	Shed %
Green Peter Head of Reservoir - Middle Santiam Arm	5,071	56.1		5/15/2023	5/16/2023	74	1.46	32	0.63
Green Peter Head of Reservoir - Quartzville Creek Arm	5,203	58.5		5/17/2023	5/18/2023	18	0.35	19	0.37
Lookout Point Head of Reservoir	10,041	63.1	2.9	5/22/2023	5/24/2023	39	0.39	53	0.53
Hills Creek Head of Reservoir	10,117	64.6	2.9	5/30/2023	6/1/2023	22	0.22	9	0.09
Fall Creek Head of Reservoir	10,040	67.3	3.2	6/1/2023	6/7/2023	68	0.68	30	0.30
Detroit Head of Reservoir - Breitenbush Arm	7,530	66.9	3.6	6/13/2023	6/14/2023	70	0.92	24	0.32
Detroit Head of Reservoir - North Santiam Arm	7,528	66.9	3.6	6/14/2023	6/15/2023	70	0.92	25	0.32
Cougar Head of Reservoir	5,626	67.7	3.5	6/20/2023	6/21/2023	475	8.4	44	0.78
North Santiam Basin – Fall 2023 and Spring 2024	30,680	67.3	3.5	6/26/2023	7/20/2023	TBD	TBD	TBD	TBD
Middle Fork Willamette – Fall 2023	50,743	NA	NA	7/26/2023	8/9/2023	TBD	TBD	TBD	TBD
South Santiam Basin – Fall 2023	23,706	NA	NA	8/14/2023	8/23/2023	TBD	TBD	TBD	TBD
McKenzie Basin – Fall 2023	36,001	NA	NA	8/30/2023	9/08/2023	TBD	TBD	TBD	TBD

Table 3. Release summary statistics. Date of release, number of marked fish released, transport tank water temperature and the beginning and end of the transport, and water temperature at the release location.

Release Location	Release Date	N	Transport Temp Start (C)	Transport Temp End (C)	Release Site Temp (C)
Green Peter Head of Reservoir - Quartzville Creek Arm	5/22/2023 14:35	5,167	12	13.2	18
Green Peter Head of Reservoir - Middle Santiam Arm	5/22/2023 20:35	4,965	11.9	12.9	18.3
Lookout Point Head of Reservoir - Black Canyon Boat Ramp	5/30/2023 10:35	9,651	11.9	12.5	13.2
Hills Creek Head of Reservoir - Bingham Boat Ramp	6/5/2023 10:35	9,817	12.9	13.2	11.4
Fall Creek Head of Reservoir	6/12/2023 15:00	9,642	16.5	17.4	19
Lookout Point Head of Reservoir - Black Canyon Boat Ramp	6/12/2023 10:20	300	13.6	13.9	14.8

Release Location	Release Date	N	Transport Temp Start (C)	Transport Temp End (C)	Release Site Temp (C)
Hills Creek Head of Reservoir - Bingham Boat Ramp	6/12/2023 12:00	288	14.4	15.1	15.1
North Santiam River - Marion Forks Hatchery Escapees	6/16/2023 - 7/13/2023	1,251	NA	NA	NA
North Santiam River - Pullout at Blowout Road Bridge	7/13/2023 11:35	6,638	11.5	13.1	13
Breitenbush River - Adult Release Facility	7/13/2023 9:45	7,002	11.5	11.8	12.5
Foster Dam Tailrace	8/23/2023 16:40	1,031	12.7	11.7	10.0
Foster Head of Reservoir	8/24/2023 10:00	2,063	13.1	13.3	15.3
Cougar Head of Reservoir	8/29/2023 11:40	5,151	14.2	11.8	10.1
Lookout Point Head of Reservoir - Black Canyon Boat Ramp	9/18/2023 8:25	5,000	12.9	13.0	13.6
Lookout Point Forebay – Singal Point Boat Ramp	9/18/2023 17:10	5,004	14.0	18.9	20.9
Dexter Tailrace – Pengra Boat Ramp	9/19/2023 11:40	2,011	12.6	17.7	19.3
Green Peter Head of Reservoir - Quartzville Creek Arm	9/20/2023 14:10	2,518	11.2	11.9	14.8
Green Peter Head of Reservoir – Middle Santiam Arm	9/21/2023 13:50	2,508	10.1	11.2	12.5
Breitenbush River - Adult Release Facility	9/26/2023 10:55	5,002	7.6	9.3	10.3
North Santiam River – Pullout at Blowout Road Bridge	9/26/2023 16:10	4,999	6.9	8.9	10.5
Big Cliff Tailrace	9/27/2023 15:45	8,009	7.1	10.7	12.7
Fall Creek Head of Reservoir	9/28/2023 14:45	5,006	11.6	12.2	13.8
Fall Creek Dam Tailrace	9/28/2023 19:25	1,001	12.5	16.3	18.3

Table 4. PIT tag recoveries at established interrogation sites, rotary screw traps (RST), and reservoir sampling locations. Recoveries during screw trap efficiency testing that were recaptured during the test (i.e., within one week of release) are not included in this table.

PIT ID	Release Date	Release Location	Recapture Date	Recapture Location	Travel Time
3D6.15348025F1	5/22/2023	Green Peter Head of Reservoir - Middle Santiam Arm	5/28/2023	Green Peter Tailrace RST	6 days
3DD.003E4BA25E	NA	Marion Forks Hatchery Escape - Horn Creek	6/17/2023	North Santiam River RST	NA
3D6.15348010F9	5/30/2023	Lookout Point Head of Reservoir	6/27/2023	Lookout Point Reservoir Trap Net	28 days
3D6.15348426D4	NA	Marion Forks Hatchery Escape - Horn Creek	7/1/2023	North Santiam River RST	NA

3D6.1534831764	5/30/2023	Lookout Point Head of Reservoir	8/20/2023	Dexter Tailrace RST	82 days
3D6.1534831A94	6/5/2023	Hills Creek Head of Reservoir	9/16/2023	Hills Creek Tailrace RST - PH	109 days
3D6.153484353B	6/5/2023	Hills Creek Head of Reservoir	9/20/2023	Hills Creek Tailrace RST - PH	113 days
3D6.1534843D2A	9/18/2023	Lookout Point Head of Reservoir	9/20/2023	Lookout Point Reservoir Gill Net	2 days
3DD.003E4C26BB	9/18/2023	Lookout Point Head of Reservoir	9/20/2023	Lookout Point Reservoir Gill Net	2 days
3D6.1534803019	5/12/2023	Hills Creek Head of Reservoir	9/21/2023	Hills Creek Tailrace RST - RO	132 days
3D6.1534831FE7	6/5/2023	Hills Creek Head of Reservoir	9/23/2023	Hills Creek Tailrace RST - PH	116 days
3D6.1534843B57	6/5/2023	Hills Creek Head of Reservoir	9/25/2023	Hills Creek Tailrace RST - PH	118 days
3D6.15347FF81F	6/5/2023	Hills Creek Head of Reservoir	9/25/2023	Hills Creek Tailrace RST - PH	118 days
3D6.15347FE8E5	6/5/2023	Hills Creek Head of Reservoir	9/25/2023	Hills Creek Tailrace RST - PH	118 days
3D6.15347FEC09	6/5/2023	Hills Creek Head of Reservoir	9/25/2023	Hills Creek Tailrace RST - PH	118 days
3D6.15347FEDD1	6/5/2023	Hills Creek Head of Reservoir	9/25/2023	Hills Creek Tailrace RST - PH	118 days
3D6.1534802DEB	5/12/2023	Hills Creek Head of Reservoir	9/25/2023	Hills Creek Tailrace RST - PH	136 days
3D6.15347FEAD8	6/5/2023	Hills Creek Head of Reservoir	9/26/2023	Hills Creek Tailrace RST - PH	119 days
3D6.1534801912	6/5/2023	Hills Creek Head of Reservoir	9/26/2023	Hills Creek Tailrace RST - PH	119 days
3DD.003E561672	9/18/2023	Lookout Point Forebay	9/28/2023	Dexter Dam Tailrace RST	10 days

Reservoir Distribution Summary

Reservoir sampling during the reporting period was conducted using 30' small mesh suspended gill nets on Lookout Point (9/17/2023-9/23/2023) and Green Peter (9/28/2023-10/01/2023) reservoirs (Table 5).

On Lookout Point Reservoir, surface temperatures at netting locations averaged 19.8 C (Table 6). In the forebay, 19 C extended from the surface to 21m, 18 C was observed from 21-29 m and 15.5-17 C was observed from 29-31m (station max depth 31 m). In Lookout Point reservoir, nets were set near each site's maximum depth to try to get as close to the thermocline as possible. Over four days of sampling, 53 juvenile walleye (mean fork length 155.6 mm), 4 bluegill (mean fork length 60.7 mm), one largemouth bass (fork length 99 mm), and one rainbow trout (fork length 432 mm) were captured (Table 7). No Chinook were captured during this reporting period on Lookout Point Reservoir.

On Green Peter Reservoir, surface temperatures at netting locations averaged 22.9 C (Table 6). Temperatures in the forebay were 19-20C down to a depth of 23m. Temperatures of 17-18 C extended from 23-24 m with 14-16C observed from 25-27m depth (station max depth 57.6 m). Gill nets were set at 26m where possible to target the thermocline. Over four days of sampling, 3 adult kokanee (mean fork length 306 mm), 5 juvenile kokanee (mean fork length 108.4 mm), one cutthroat trout (fork length 217 mm), one bluegill (fork length 82 mm) and one unmarked juvenile Chinook (fork length 119 mm) were captured.

Table 5. Start and end date by statistical week.

Week	Start	End	Reservoir	Net Type	Effort
24	6/11/2023	6/17/2023	Green Peter	oneida	47.7 hours
25	6/18/2023	6/24/2023	Green Peter	box minnow	746.5 hours
25	6/18/2023	6/24/2023	Green Peter	oneida	304.1 hours
26	6/25/2023	7/1/2023	Lookout Point	box minnow	682.7 hours
26	6/25/2023	7/1/2023	Lookout Point	oneida	217.1 hours
27	7/2/2023	7/8/2023	Green Peter	box minnow	689.1 hours
27	7/2/2023	7/8/2023	Green Peter	oneida	298.0 hours
28	7/9/2023	7/15/2023	Lookout Point	box minnow	642.5 hours
28	7/9/2023	7/15/2023	Lookout Point	oneida	210.6 hours
29	7/16/2023	7/22/2023	NA	NA	0 hours
30	7/23/2023	7/29/2023	NA	NA	0 hours
31	7/30/2023	8/5/2023	Green Peter	Gill Net – 30'	537.7 hours
31	7/30/2023	8/5/2023	Green Peter	Gill Net – 80'	70.1 hours
32	8/6/2023	8/11/2023	NA	NA	0 hours
33	8/13/2023	8/19/2023	Green Peter	Gill Net – 30'	215.9 hours
34	8/20/2023	8/25/2023	Lookout Point	Gill Net – 30'	600.8 hours
35	8/27/2023	9/2/2023	Green Peter	Gill Net – 30'	632.3 hours
36	9/3/2023	9/9/2023	Lookout Point	Gill Net – 30'	395.3 hours
37	9/10/2023	9/16/2023	Green Peter	Gill Net – 30'	472.8 hours
38	9/17/2023	9/23/2023	Lookout Point	Gill Net – 30'	566.0 hours
39	9/24/2023	9/30/2023	Green Peter	Gill Net – 30'	543.4 hours

Table 6. Mean surface water temperature measure during each trap net deployment.

Week	Reservoir	Mean Water Surface Temperature °C
24	Green Peter	20.5
25	Green Peter	21.1
26	Lookout Point	21.7
27	Green Peter	24.1
28	Lookout Point	23.3
29	NA	NA
30	NA	NA
31	Green Peter	24.7
32	NA	NA
33	Green Peter	25.5
34	Lookout Point	21.4
35	Green Peter	23.6
36	Lookout Point	20.6
37	Green Peter	22.9
38	Lookout Point	19.8
39	Green Peter	21.0

Table 7. Summary of catch by reservoir. BLC - Black Crappie, BLG - Bluegill, CHS – Chinook salmon, CUT - Cutthroat trout, LMB - Largemouth bass, LSS - Large-scale sucker, NPM - Northern Pike Minnow, SMB - Smallmouth Bass, WAL - Walleye.

Week	Reservoir	Species	Catch
24	Green Peter	BLC	1
24	Green Peter	BLG	128
24	Green Peter	SMB	2
25	Green Peter	BLC	1
25	Green Peter	BLG	220
25	Green Peter	CUT	1
25	Green Peter	LMB	52
25	Green Peter	NPM	1
25	Green Peter	SMB	6
26	Lookout Point	BLG	6,474
26	Lookout Point	CHS	9
26	Lookout Point	LMB	1
26	Lookout Point	LSS	1
26	Lookout Point	SMB	283
26	Lookout Point	WAL	19
27	Green Peter	BLC	1

Week	Reservoir	Species	Catch
27	Green Peter	BLG	253
27	Green Peter	CUT	2
27	Green Peter	LMB	2
27	Green Peter	NPM	2
27	Green Peter	SMB	25
28	Lookout Point	BBH	1
28	Lookout Point	BLG	6,000
28	Lookout Point	CHS	9
28	Lookout Point	LMB	1
28	Lookout Point	NPM	3
28	Lookout Point	SMB	105
28	Lookout Point	SMG	4
28	Lookout Point	WAL	1
31	Green Peter	KOK	6
31	Green Peter	RBT	11
31	Green Peter	SMB	2
34	Lookout Point	BLG	2
34	Lookout Point	WAL	29
35	Green Peter	KOK	2
36	Lookout Point	WAL	6
38	Lookout Point	BLG	4
38	Lookout Point	LMB	1
38	Lookout Point	RMT	1
38	Lookout Point	WAL	53
39	Green Peter	BLG	1
39	Green Peter	CHS	1
39	Green Peter	CUT	1
39	Green Peter	KOK	8

Table 8. Detailed catch summary of target species.

Week	Reservoir	Zone	Species	Catch	length_min	length_mean	length_max
26	Lookout Point	MIDDLE	CHS	4	80	87.2	92
26	Lookout Point	UPPER	CHS	5	73	83.6	95
28	Lookout Point	UPPER	CHS	8	77	84.8	100
38	Lookout Point	MIDDLE	CHS	2	132	134	136
39	Green Peter	UPPER	CHS	1	119	119	119

Appendix A. Release Site Maps

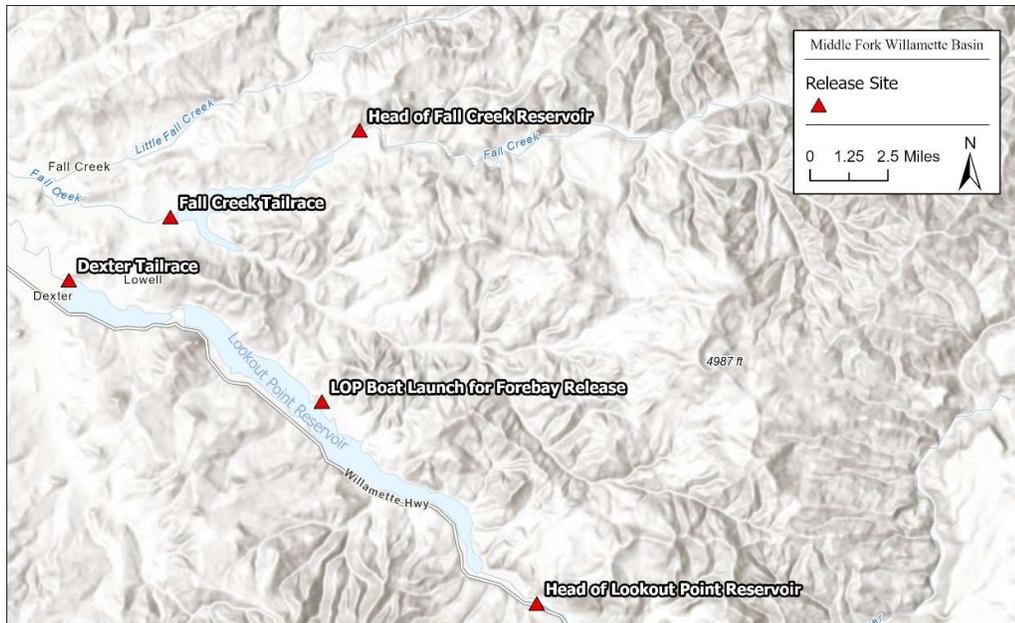


Figure 1. Map of Lookout Point, Dexter tailrace and Fall Creek release locations within the Middle Fork Willamette Basin.

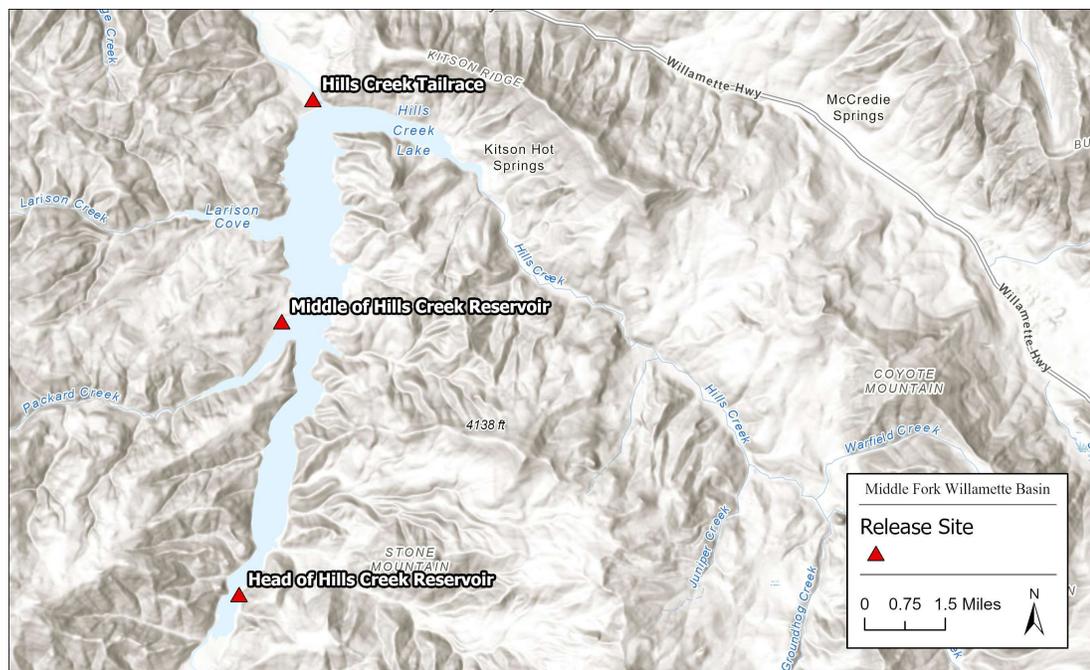


Figure 2. Map of Hills Creek Reservoir release locations within the Middle Fork Willamette Basin.

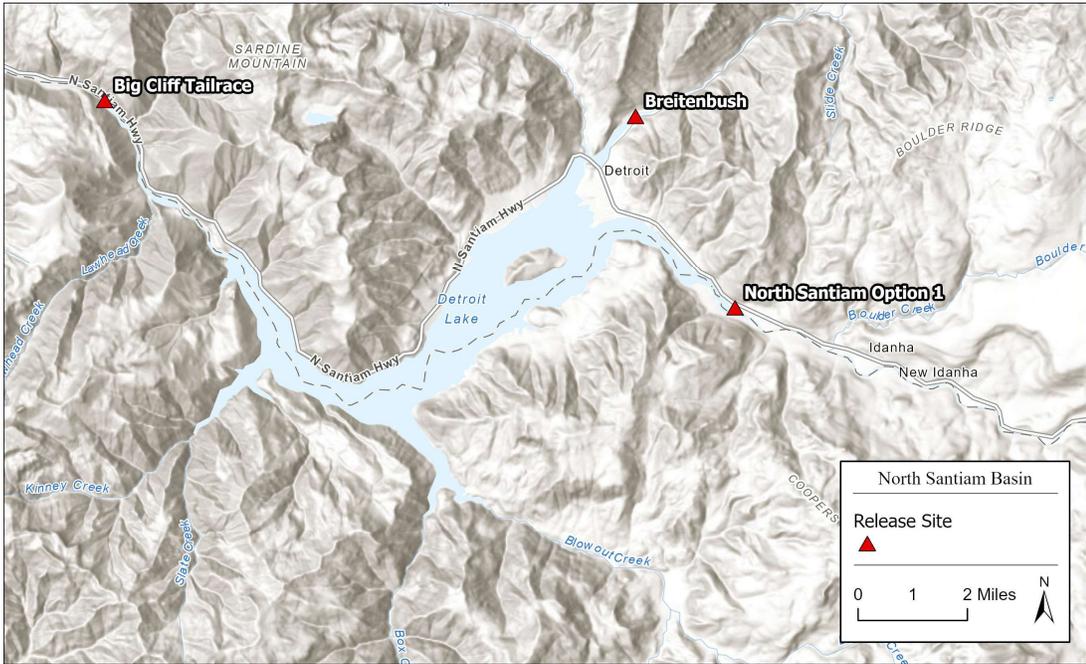


Figure 3. Map of release locations within the North Santiam Basin.

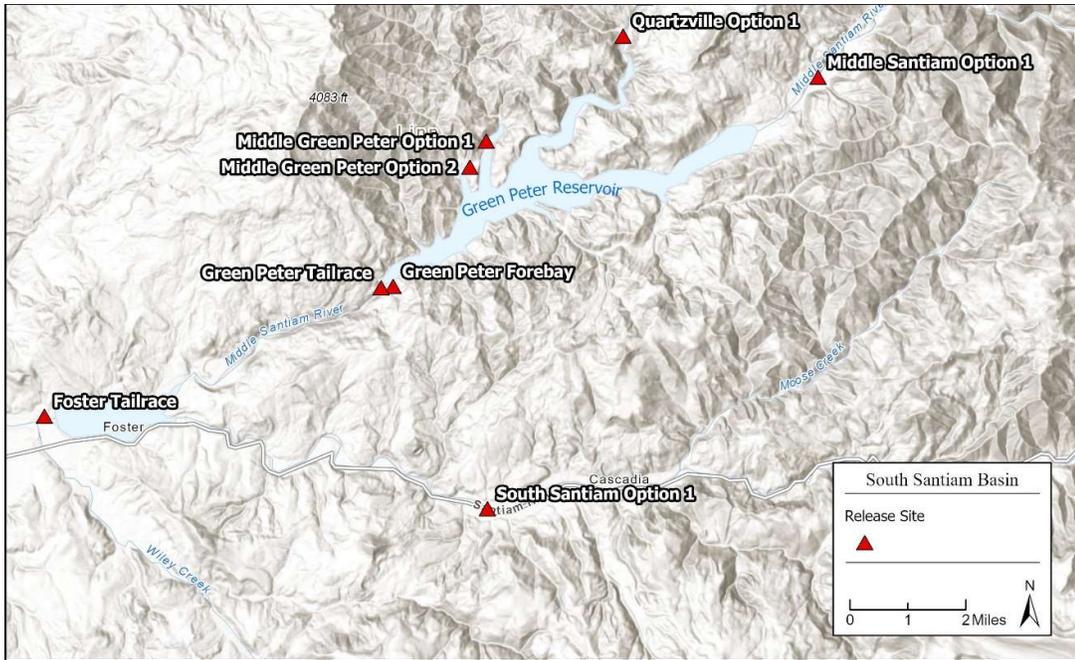


Figure 4. Map of release locations in the Middle/South Santiam basin including Green Peter Reservoir.

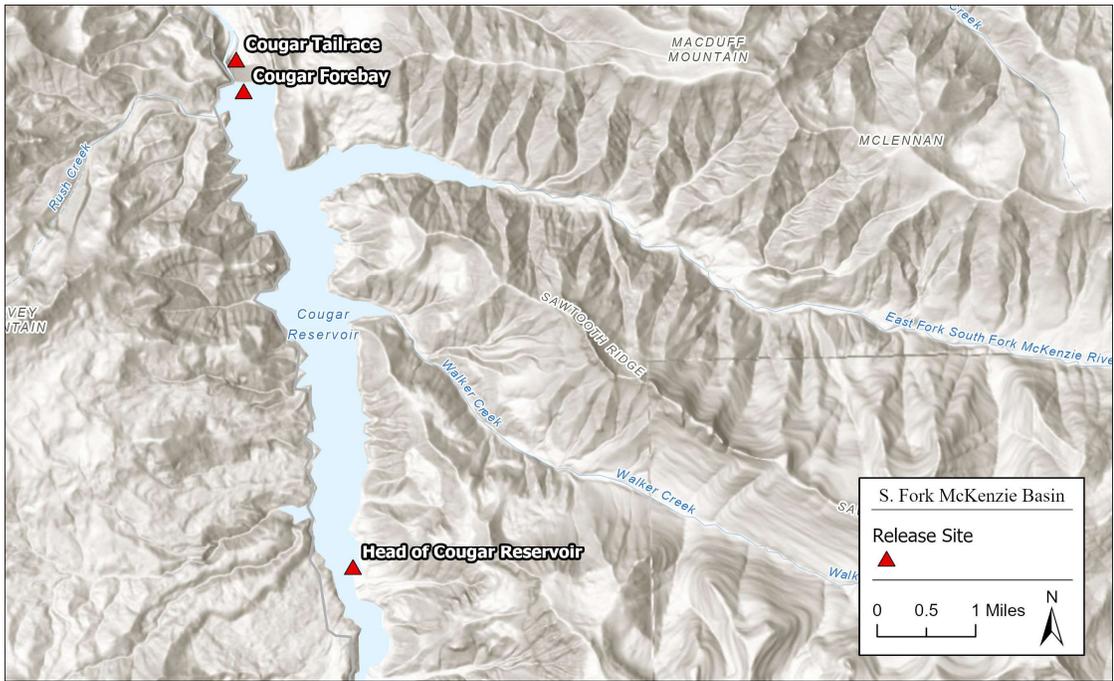


Figure 5. Map of release locations at Cougar Reservoir.

Appendix B. Reservoir Sampling Zones

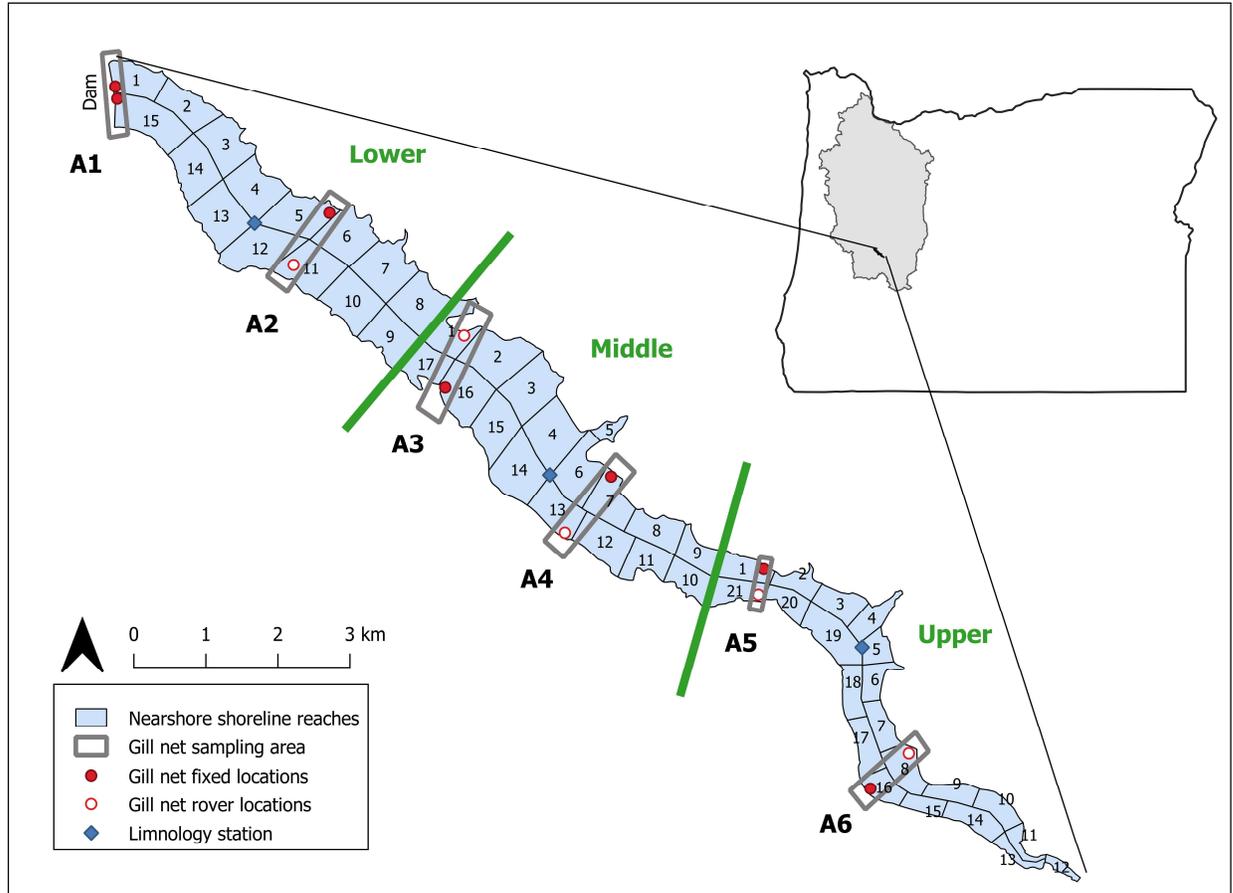


Figure 6. Map of Lookout Point Reservoir nearshore shoreline reaches, reservoir zones (lower, middle and upper), gill netting sampling areas and limnological stations.

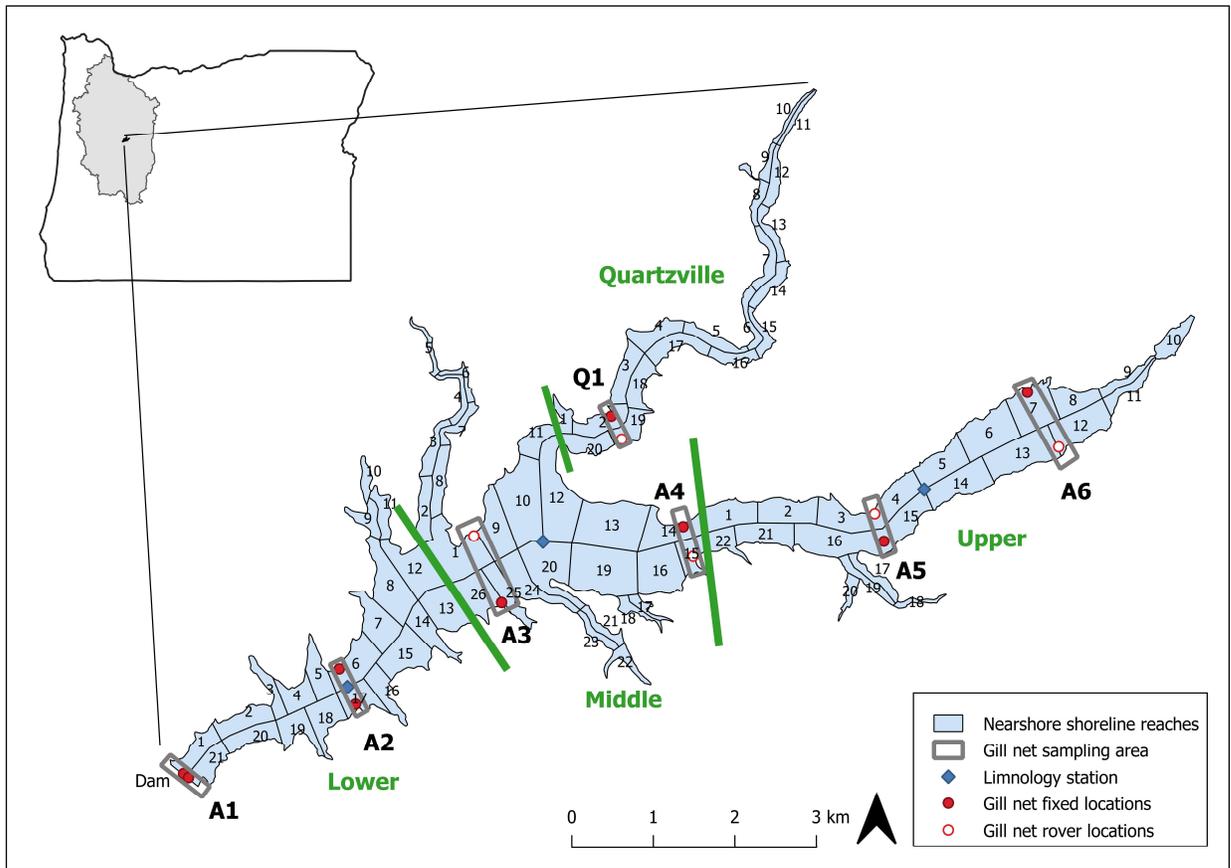


Figure 7. Map of Green Peter Reservoir nearshore shoreline reaches, reservoir zones (lower, middle and upper), gill netting sampling areas and limnological stations.