

WILLAMETTE VALLEY FISH PASSAGE MONITORING – BULK MARKING & RESERVOIR DISTRIBUTION

Bi-Weekly Report: August 16, 2023 – August 31, 2023



Prepared for: United States Army Corps of Engineers

Prepared by: Cramer Fish Sciences

August 7, 2023

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

During the recent reporting period, staff at Cramer Fish Sciences tagged 29,589 juvenile Chinook salmon. We successfully tagged all required fish for the South Santiam River basin's fall release groups and made substantial progress in tagging those for the McKenzie River basin (Table 2).

Furthermore, we released three sets of juvenile Chinook salmon. In the South Santiam Basin, 2,063 fish were released near the Foster reservoir head by the Cascadia covered bridge, and another 1,031 were released in the Foster Dam tailrace. In the McKenzie River basin, 5,151 fish were released at the Cougar reservoir head. Notably, these McKenzie River fish, held since late June due to ongoing disease issues at Leaburg hatchery, experienced high post-tagging mortality rates (Table 3).

Recaptures

There was one new recapture during this reporting period. The fish had been released at Lookout Point head of reservoir on 27 June 2023 and was recaptured in the Dexter tailrace rotary screw trap on 20 August 2023 (travel time of 82 days, Table 4). There have been five recaptures of PIT tagged fish so far this year.

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	11,000	NA	NA	8/30/2023	8/31/2023	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

Table 4. PIT tag recoveries. RST = rotary screw trap.

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

Reservoir Distribution Summary

The reservoir crew missed out on nearly a full week of sampling Lookout Point reservoir due to unforeseen environmental factors. The Bedrock and Lookout fires caused air quality to drop to unhealthy levels. Starting Monday (August 14, 2023) the fires had begun rapidly spreading out of control requiring fire crews to transfer water from Lookout Point reservoir to the burn zone. In the event of an evacuation, CFS crews needed to maintain a safe distance from the wildland firefighters working diligently to keep residents safe. The next day, Tuesday (August 15, 2023), a similar situation unfolded with wildland fire crews scooping water from the reservoir to aid in suppressing the nearby fires. The reservoir was deemed unsafe to sample and the crew instead worked on developing a system to moor a research vessel at Green Peter reservoir. The boat was successfully moored and the crew was able to set gill nets. However, the sets did not result in catching any fish.

The following week (8/20/2023 – 8/25/2023) the crew returned to Lookout Point and deployed gill nets in eight different locations throughout the reservoir. No target species were captured. The majority of the catch were juvenile walleye (Table 7).

During the final week of the reporting period the crew sampled Green Peter Reservoir. Once again no target species were encountered.

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
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

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

Week	Reservoir	Mean Water Surface Temperature °C
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

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
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

Week	Reservoir	Species	Catch
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

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

Appendix A. Release Site Maps

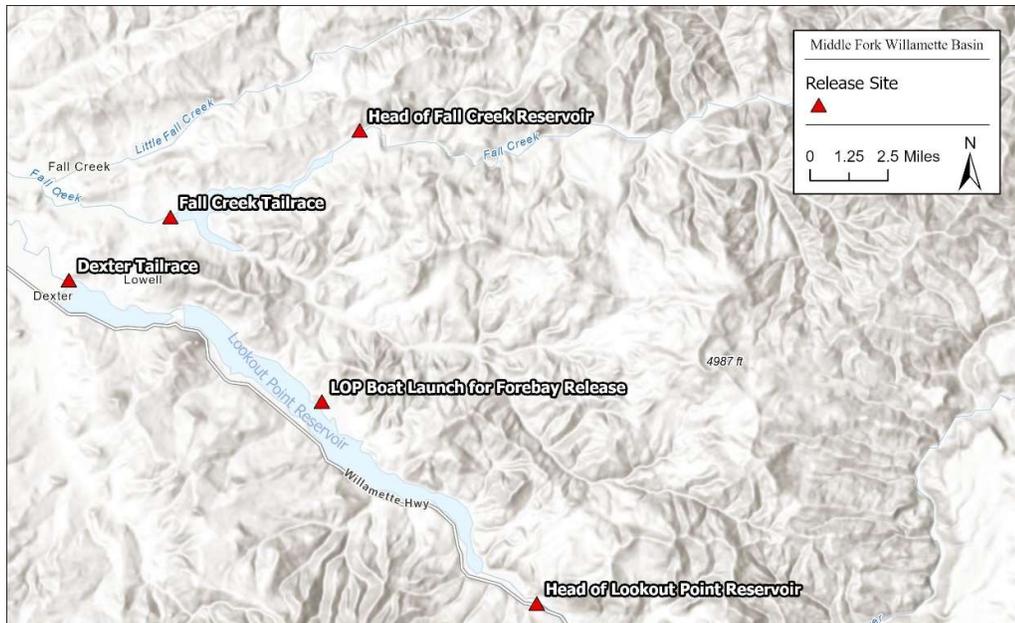


Figure 1. Map of Lookout Point, Dexter tailrace and Fall Creek release locations within the Middle Fork Willamette Basin.

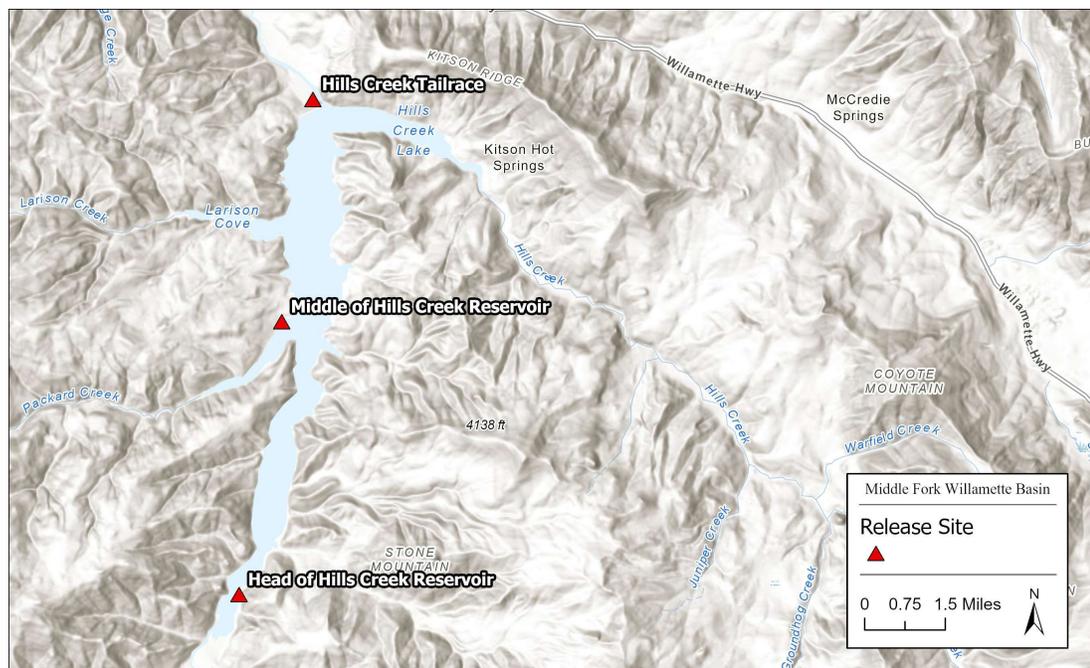


Figure 2. Map of Hills Creek Reservoir release locations within the Middle Fork Willamette Basin.

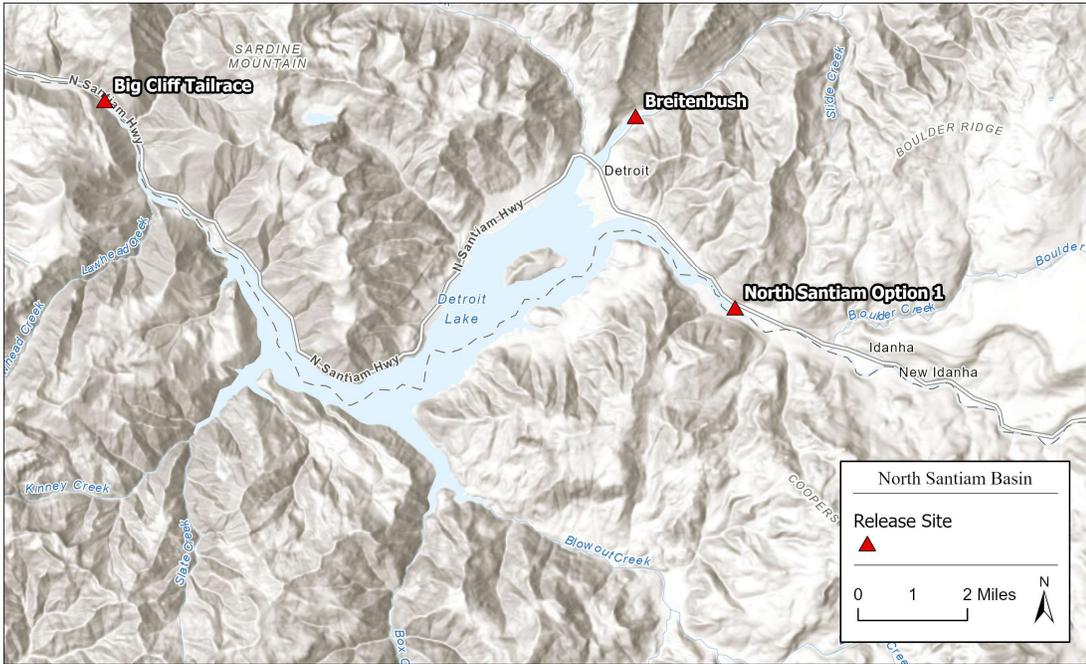


Figure 3. Map of release locations within the North Santiam Basin.

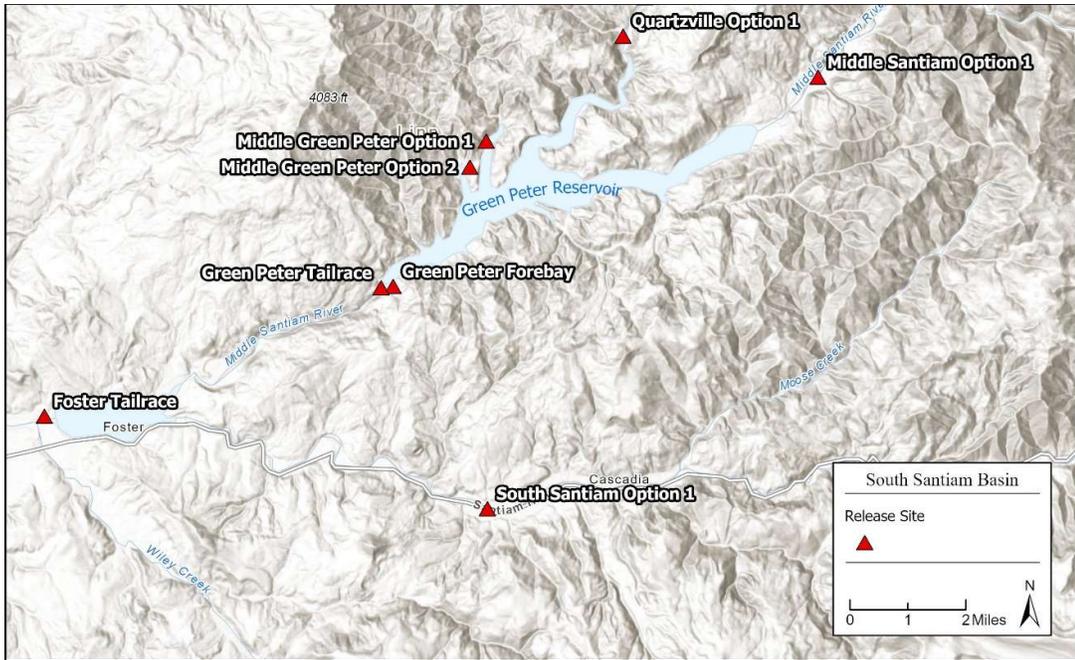


Figure 4. Map of release locations in the Middle/South Santiam basin including Green Peter Reservoir.

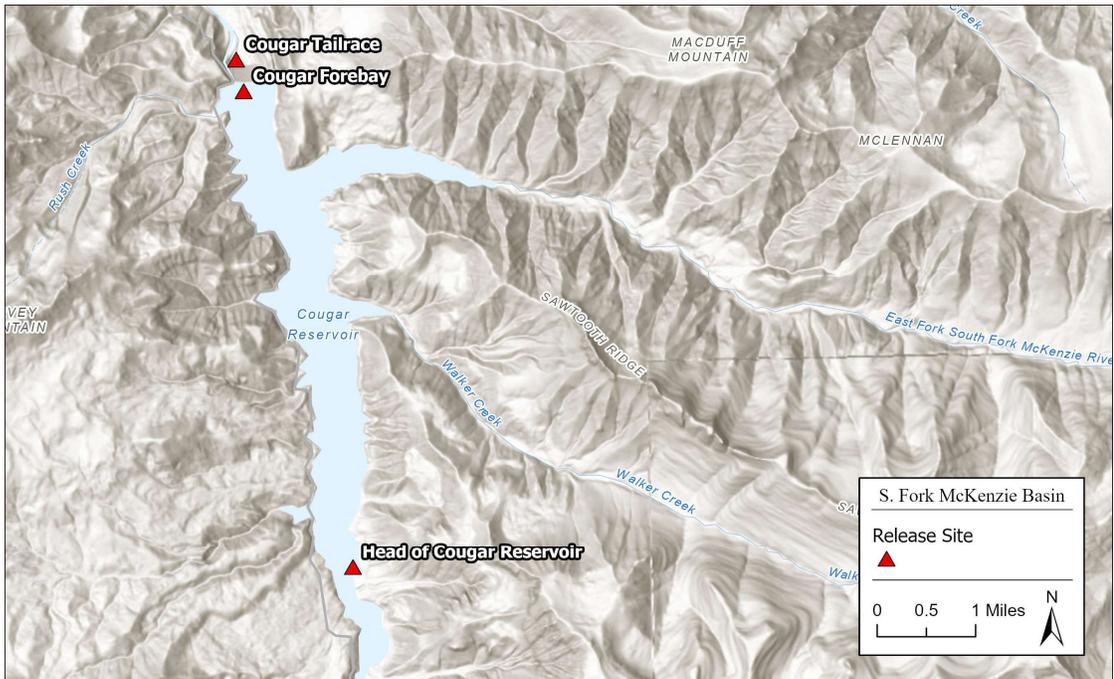


Figure 5. Map of release locations at Cougar Reservoir.

Appendix B. Reservoir Sampling Zones

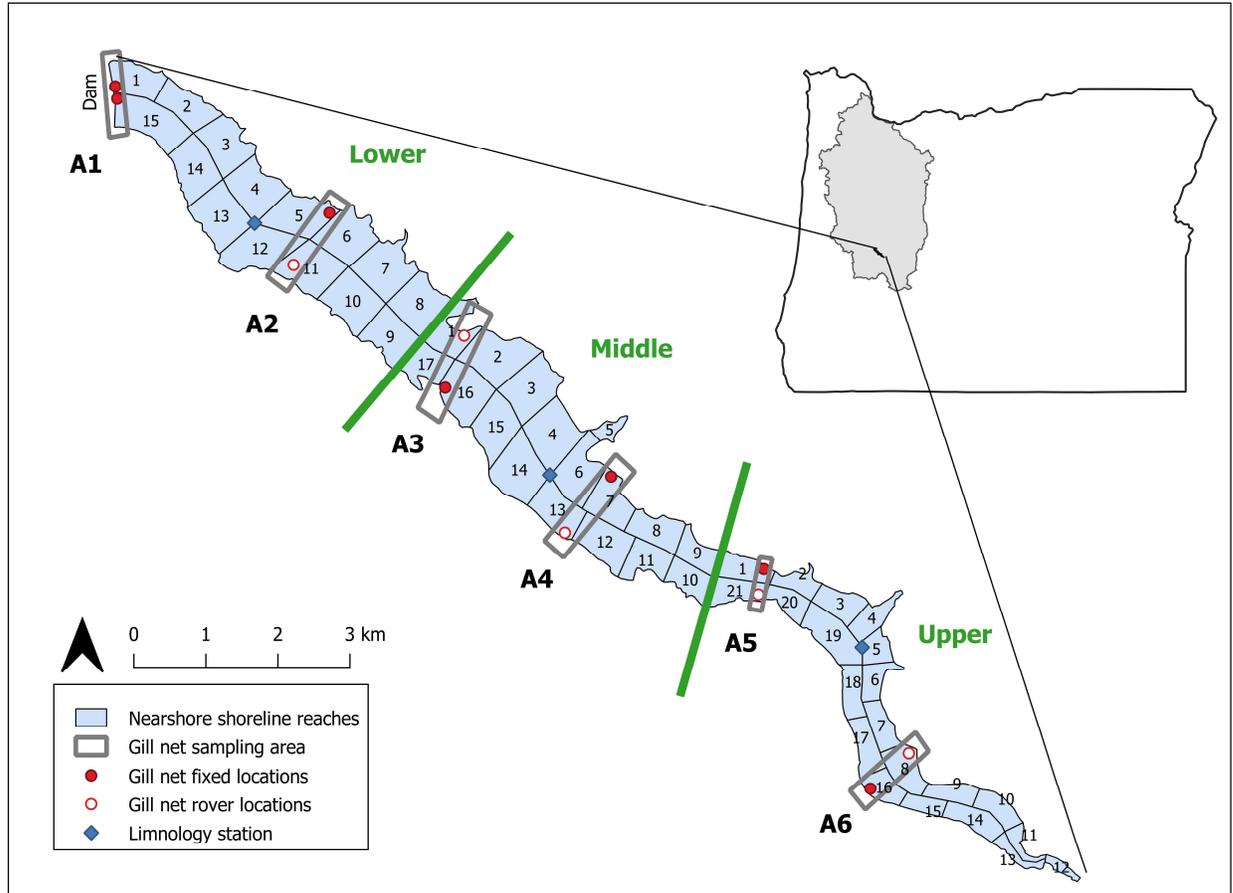


Figure 6. Map of Lookout Point Reservoir nearshore shoreline reaches, reservoir zones (lower, middle and upper), gill netting sampling areas and limnological stations.

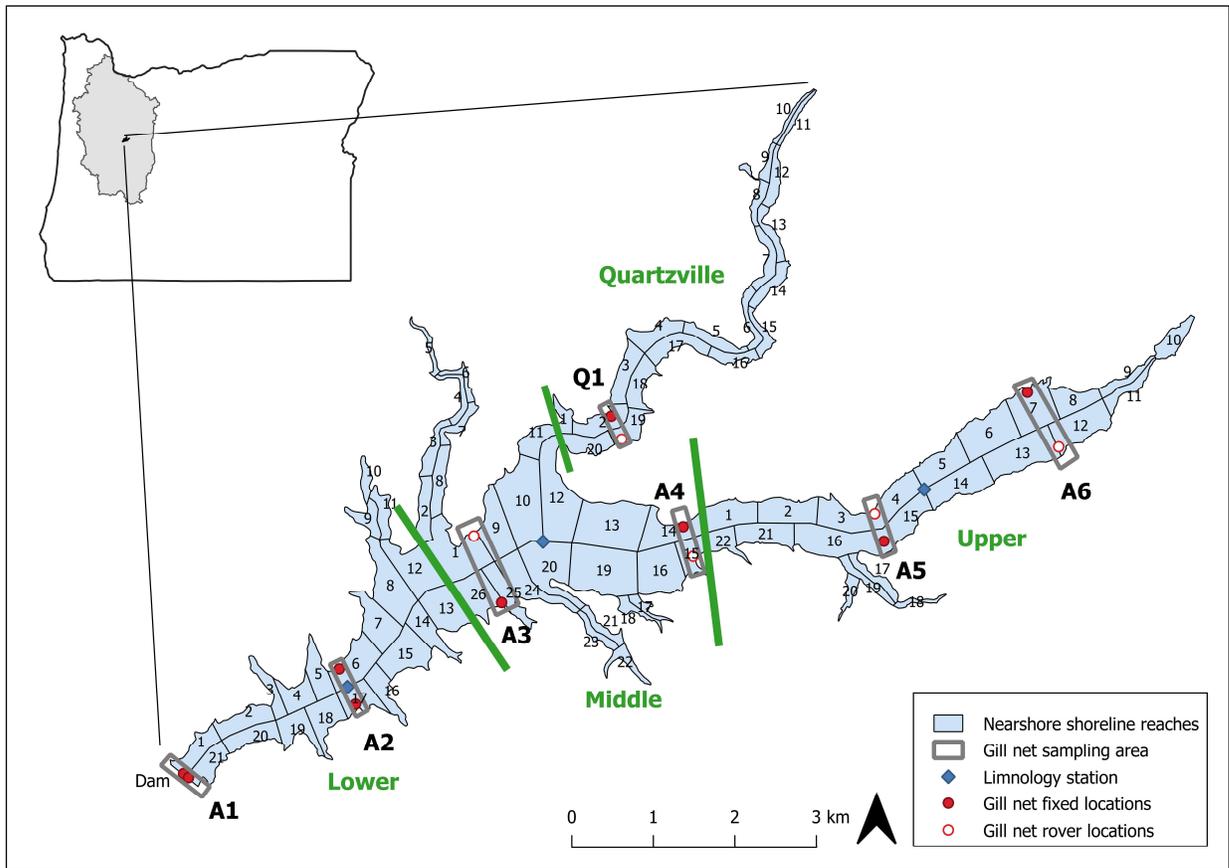


Figure 7. Map of Green Peter Reservoir nearshore shoreline reaches, reservoir zones (lower, middle and upper), gill netting sampling areas and limnological stations.