

WILLAMETTE VALLEY FISH PASSAGE MONITORING – BULK MARKING & RESERVOIR DISTRIBUTION

Bi-Weekly Report: February 1, 2024 – February 15, 2024



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	Middle Santiam	fry	2500
2023	April	South Santiam	Green Peter Reservoir	Quartzville Creek	fry	2500
2023	April	MF Willamette	Hills Creek Reservoir	Head of Reservoir	fry	5000
2023	April	South Santiam	Green Peter Reservoir	Middle Santiam	fry	2500
2023	April	South Santiam	Green Peter Reservoir	Quartzville Creek	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	Middle Santiam	sub-yearling	2500
2023	September	South Santiam	Green Peter Reservoir	Quartzville Creek	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	Middle Santiam	sub-yearling	2500
2023	October	South Santiam	Green Peter Reservoir	Quartzville Creek	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
2024	April	South Santiam	Green Peter Reservoir	Tailrace	Yearling	1000
2024	April	South Santiam	Green Peter Reservoir	Forebay	Yearling	2000
2024	April	South Santiam	Green Peter Reservoir	Middle Santiam	Yearling	1000
2024	April	South Santiam	Green Peter Reservoir	Quartzville Creek	Yearling	1000
2024	April	South Santiam	Green Peter Reservoir	Mid Reservoir	Yearling	2000
2024	April	South Santiam	Foster Reservoir	Tailrace	Yearling	5000
2024	April	South Santiam	Foster Reservoir	Head of Reservoir	Yearling	5000
2024	April	South Santiam	Foster Reservoir	Tailrace	Yearling	2000
2024	April	South Santiam	Foster Reservoir	Head of Reservoir	Yearling	1000
2024	April	South Santiam	Foster Reservoir	Head of Reservoir	Yearling	2000

BULK MARKING SUMMARY

During the most recent reporting period the Bulk Marking project finished PIT tagging the remaining brood year 2022 McKenzie stock fish (Table 2). In addition, our project released tagged fish across several sites within the Middle Fork Willamette. On January 31st, 25,001 fish with a mean fork length of 141.7 mm were released at Hills Creek Dam Tailrace. On February 6th, 4,997 fish (mean fork length 153.8 mm) were released at Hills Creek Head of Reservoir. The next day, 4,995 fish (mean fork length 155.9 mm) were released at Hills Creek Mid, and another 2,997 fish (mean fork length 151.7 mm) at Hills Creek Dam Tailrace. Looking ahead, our crews will proceed with additional releases within the Middle Fork Willamette at Fall Creek, then transition to releases at Green Peter and Cougar.

Recaptures

A total of 10 new detections occurred during the most reporting period. There were seven detections at the Lookout Point Tailrace rotary screw traps, 2 detections at Sauvie Island Dairy Creek, and a single detection at the Cougar Dam. We estimate that a total of 3,005 PIT tagged fish from this project have been detected since we began releasing fish in May of 2023 (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	Mort	Mort. %	Sheds	Shed %
Green Peter Head of Reservoir - Middle Santiam	5,071	56.2	NA	5/15/2023	5/16/2023	74	1.46	32	0.63
Green Peter Head of Reservoir - Quartzville Creek	5,203	58.5	NA	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	64.7	2.9	5/30/2023	6/1/2023	22	0.22	9	0.09
Fall Creek Head of Reservoir	10,040	67.4	3.2	6/1/2023	6/7/2023	68	0.68	30	0.3
Detroit Head of Reservoir Breitenbush Arm	7,530	66.9	3.6	6/13/2023	6/14/2023	82	1.09	24	0.32
Detroit Head of Reservoir - North Santiam Arm	7,528	66.9	3.6	6/14/2023	6/15/2023	83	1.10	25	0.32
Cougar Head of Reservoir	5,626	67.7	3.5	6/20/2023	6/20/2023	475	8.40	44	0.78
North Santiam – Fall 23 & Spring 24 Bulk Group	30,680	67.3	3.5	6/26/2023	7/20/2023	3,437	10.6	99	0.32
M.F. Willamette – Fall 23 & Spring 24 Bulk Group	85,233	NA	NA	7/26/2023	12/7/2023	380	0.45	340	0.40
South Santiam – Fall 23 & Spring 2024 Bulk Group	43,407	NA	NA	8/14/2023	12/20/2023	128	0.29	101	0.23
McKenzie– Fall 23 & Spring 24 Bulk Group	45,210	NA	NA	8/30/2023	2/14/2024	987	2.18	60	0.13
M.F. Willamette – Additional 51,000 Group	51,000	145.1	35.9	1/01/2024	1/31/2021	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.

Basin	Release Location	Release Date	Fish	Mean FL (mm)	Mean Weight (g)	Release Temp (C)
SST	Green Peter Head of Reservoir - Quartzville Creek Arm	5/22/2023	5171	58.5	NA	18.30
SST	Green Peter Head of Reservoir - Middle Santiam Arm	5/22/2023	4961	56.2	NA	18.00
MFW	LOP Head of Reservoir - Black Canyon	5/30/2023	9647	63.1	2.9	13.20
MFW	Hills Creek Head of Reservoir	6/5/2023	9784	64.7	2.8	11.40
MFW	Fall Creek Head of Reservoir - Old Boat Ramp	6/12/2023	9649	67.4	3.2	19.00
NST	Marion Forks Hatchery Escape	6/16/2023	1247	NA	NA	NA

Basin	Release Location	Release Date	Fish	Mean FL (mm)	Mean Weight (g)	Release Temp (C)
NST	Detroit Head of Reservoir - Breitenbush River	7/13/2023	7000	66.9	3.6	12.50
NST	Detroit Head of Reservoir - North Santiam River	7/13/2023	6638	66.9	3.6	13.00
SST	Foster Tailrace - South Santiam Hatchery	8/23/2023	1030	115.7	18.2	10.00
SST	Foster Reservoir Head of Reservoir - Cascadia Covered Bridge	8/24/2023	2059	105.6	14.5	15.30
MCK	Cougar Head of Reservoir - Cougar Crossing Bridge	8/29/2023	5200	NA	NA	10.10
MFW	LOP Head of Reservoir - Black Canyon	9/18/2023	4998	122.9	23.8	20.90
MFW	LOP Forebay - Signal Point	9/18/2023	5002	128.3	25.1	13.60
MFW	LOP Tailrace - Pengra	9/19/2023	2011	128.4	25.2	19.30
SST	Green Peter Head of Reservoir - Quartzville Creek Arm	9/20/2023	2518	113.5	19.5	14.80
SST	Green Peter Head of Reservoir - Middle Santiam Arm	9/21/2023	2508	117.1	20.7	12.50
NST	Detroit Head of Reservoir - Breitenbush River	9/26/2023	5002	106.5	11.8	10.50
NST	Detroit Head of Reservoir - North Santiam River	9/26/2023	4997	102.6	10.4	10.30
NST	Big Cliff Tailrace - Packsaddle Boat Ramp	9/27/2023	8009	106.5	11.9	12.70
MFW	Fall Creek Head of Reservoir - Old Boat Ramp	9/28/2023	5006	133.5	29.1	13.80
MFW	Fall Creek Tailrace	9/28/2023	1001	134.8	29.8	18.30
MCK	Cougar Head of Reservoir - Cougar Crossing Bridge	10/2/2023	5006	117.2	18.9	8.30
MCK	Cougar Head of Reservoir - Cougar Crossing Bridge	10/2/2023	3006	116.7	19	8.70
SST	Green Peter Head of Reservoir - Quartzville Creek Arm	10/3/2023	2502	122.8	25.1	12.50
SST	Green Peter Head of Reservoir - Middle Santiam Arm	10/4/2023	2516	119.6	23.8	13.30
SST	Green Peter Tailrace - Sunnyside Boat Ramp	10/9/2023	4002	125.9	26.4	18.10
SST	Foster Reservoir Head of Reservoir - Cascadia Covered Bridge	10/10/2023	5000	125.8	24.5	13.20
SST	Foster Tailrace - South Santiam Hatchery	10/11/2023	4000	135.2	31.8	12.00
MCK	Cougar Head of Reservoir - Cougar Crossing Bridge	10/18/2023	3979	118.4	19.8	8.00
MCK	Cougar Forebay	10/18/2023	5010	120.8	21	15.40
MCK	Cougar Tailrace - USGS	10/19/2023	3997	112.5	16.8	10.50
MFW	Fall Creek Head of Reservoir - Old Boat Ramp	11/6/2023	5000	139.4	32.2	10.80
MFW	Fall Creek Tailrace	11/6/2023	1000	134.9	30.2	11.30
MFW	Hills Creek Head of Reservoir	11/7/2023	5000	135.2	28.6	8.70
MFW	Hills Creek Mid Reservoir - Packard Creek Boat Ramp	11/8/2023	4999	145.3	36.9	14.30
MFW	Hills Creek Dam Tailrace	11/9/2023	2999	129.4	26.9	12.50
MCK	Cougar Head of Reservoir - Cougar Crossing Bridge	11/13/2023	3999	121.3	23	8.00

Basin	Release Location	Release Date	Fish	Mean FL (mm)	Mean Weight (g)	Release Temp (C)
MCK	Cougar Forebay	11/14/2023	4995	124.6	23.8	8.10
MCK	Cougar Tailrace - USGS	11/15/2023	2412	120.1	21.5	8.40
NST	Big Cliff Tailrace - Packsaddle Boat Ramp	11/20/2023	5998	112.4	16.6	10.50
MFW	LOP Head of Reservoir – Black Canyon Campground	1/3/2024	4634	143.3	33.7	7.1
MFW	LOP Head of Reservoir – Black Canyon Campground	1/4/2024	4828	143.3	33.7	7.2
MFW	LOP Head of Reservoir – Black Canyon Campground	1/8/2024	3790	148.3	37.2	6.1
MFW	LOP Head of Reservoir – Black Canyon Campground	1/9/2024	5115	148.3	37.2	6.0
MFW	LOP Head of Reservoir – Black Canyon Campground	1/25/2024	7634	143.6	34.3	6.0
MFW	Hills Creek Dam Tailrace	1/31/2024	25,001	141.7	34.9	7.2
MFW	Hills Creek Head of Reservoir	2/6/2024	4,997	153.8	40.9	6.0
MFW	Hills Creek Mid Reservoir - Packard Creek Boat Ramp	2/7/2024	4,995	155.9	41.7	7.0
MFW	Hills Creek Dam Tailrace	2/7/2024	2,997	151.7	43	6.5

Table 4. PIT tag recovery summary 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.

Observation Location	Capture Method	Season Total	Reporting Period Total
CGR - Cougar Dam	Screw Trap	1,633	1
FAL - Fall Creek Dam (USACE), MF Willamette River	Screw Trap	434	0
HCR - Hills Creek Dam, Middle Fork Willamette River	Screw Trap	238	0
LOP - Lookout Point Dam (USACE), MF Willamette River	Screw Trap	170	7
MCKESF - South Fork McKenzie River	Screw Trap	133	0
LD3 - Lebanon Dam Diversion Bypass	Passive	90	0
LD2 - Lebanon Dam North Ladder	Passive	52	0
LD1 - Lebanon Dam South Ladder	Passive	49	0
DEX - Dexter Dam (USACE), Middle Fork Willamette River	Screw Trap	42	0
WILRMF - Middle Fork Willamette River	Screw Trap	42	0
GPD - Green Peter Dam	Screw Trap	32	0
LD4 - Lebanon Dam Spillway	Passive	24	0
NSANTR - North Santiam River, Oregon	Bypass Sub-Sample	24	0

PD7 - Columbia River Estuary rkm 70	Passive	19	0
BCL - Big Cliff Dam - North Santiam River	Screw Trap	9	0
LOP - Lookout Point Dam (USACE), MF Willamette River	Gillnet Fishery or Research	6	0
NSANTR - North Santiam River, Oregon	Screw Trap	3	0
SID - Sauvie Island Dairy Creek	Passive	4	2
LOP - Lookout Point Dam (USACE), MF Willamette River	Fyke Net	1	0

Reservoir Distribution Summary

Reservoir sampling for 2024 commenced during the 2/1/2024 – 2/15/2024 reporting period. Reservoir sampling during the reporting period was conducted in the nearshore of Lookout Point and Green Peter reservoirs using Oneida lake traps and box minnow traps (Table 5). Each reservoir received one week of sampling effort, consisting of 3 days of 24 hour trap sets, requiring four days in the field. Sampling on Lookout Point this reporting period was shortened by half a day (fewer nets set) due to a boat mechanical issue on the first day of sampling. Sampling resumed the following day using a backup research boat.

In Lookout Point reservoir, surface temperatures at trap locations averaged 8.0 C during week 6 (2/05/2024-2/11/2024) (Table 6). Traps were set at the surface in each reservoir zone (Lower, Middle, Upper). Over four days of sampling (n=7 Oneida sets, n=21 box minnow sets), three natural origin yearling juvenile Chinook salmon (FL range 80-88mm) were captured, one hatchery pit-tagged yearling Chinook salmon was recaptured (FL 117 mm) and two natural origin yearling *O. mykiss* (FL range 79-97mm) (Table 7). All Chinook salmon were captured in the upper and middle zones of the reservoir. All unmarked Chinook salmon and *O. mykiss* were pit-tagged in the field and released except one *O. mykiss* mortality. Non-target catch consisted of 2 cutthroat trout, 1 northern pikeminnow and 1 sculpin.

Surface temperatures at trap locations on Green Peter Reservoir averaged 8.2 C during week 7 (2/12/2024-2/18/2024) (Table 6). Traps were set at the surface in each reservoir zone (Lower, Middle, Upper, Quartzville arm). Over four days of sampling (n=12 Oneida sets, n=30 box minnow sets), seven natural origin Chinook salmon fry (FL range 37-46 mm) were captured. Each was given a visual implant elastomer (VIE) tag prior to release. Chinook salmon fry were caught in the Lower, Middle and Upper reservoir zones. Six natural origin *O. mykiss* were captured, consisting of three age classes (Fry: n=3, FL range 35-38 mm; Age 1+: n=2, FL range 149-188mm, Age 2+: n=1, FL 305mm). *O. mykiss* less than 45mm were given a VIE tag and those greater than 45mm were tagged with pit tags. Non-target catch consisted of 8 bluegill, 2 cutthroat trout, one lamprey, and one northern pikeminnow.

Table 5. Start and end date by statistical week.

Week	Start	End	Reservoir	Net Type	Effort (# 24 hr sets)
6	2/5/2024	2/11/2024	Lookout Point	Box minnow	21
6	2/5/2024	2/11/2024	Lookout Point	Oneida	7
7	2/12/2024	2/18/2024	Green Peter	Box minnow	30
7	2/12/2024	2/18/2024	Green Peter	Oneida	12

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

Week	Reservoir	Mean Water Surface Temperature °C
6	Lookout Point	8.0
7	Green Peter	8.2

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, LRY - Lamprey.

Week	Reservoir	Species	Catch
6	Lookout Point	CHS	4
6	Lookout Point	CUT	2
6	Lookout Point	NPM	1
6	Lookout Point	RBT	2
6	Lookout Point	SCU	1
7	Green Peter	BLG	8
7	Green Peter	CHS	7
7	Green Peter	CUT	2
7	Green Peter	LRY	1
7	Green Peter	NPM	1
7	Green Peter	RBT	6

Table 8. Detailed catch summary of target species.

Week	Reservoir	Zone	Species	Catch	Min. Length	Mean Length	Max Length
6	Lookout Point	LOWER	RBT	1	79	79	79
6	Lookout Point	MIDDLE	CHS	3	80	93.7	117
6	Lookout Point	MIDDLE	RBT	1	97	97	97
6	Lookout Point	UPPER	CHS	1	88	88	88
7	Green Peter	LOWER	CHS	1	46	46	46
7	Green Peter	LOWER	RBT	2	149	227	305
7	Green Peter	MIDDLE	CHS	5	37	40.2	42
7	Green Peter	QUARTZVILLE	RBT	1	188	188	188
7	Green Peter	UPPER	CHS	1	37	37	37
7	Green Peter	UPPER	RBT	3	35	36.7	38

Appendix A. Release Site Maps

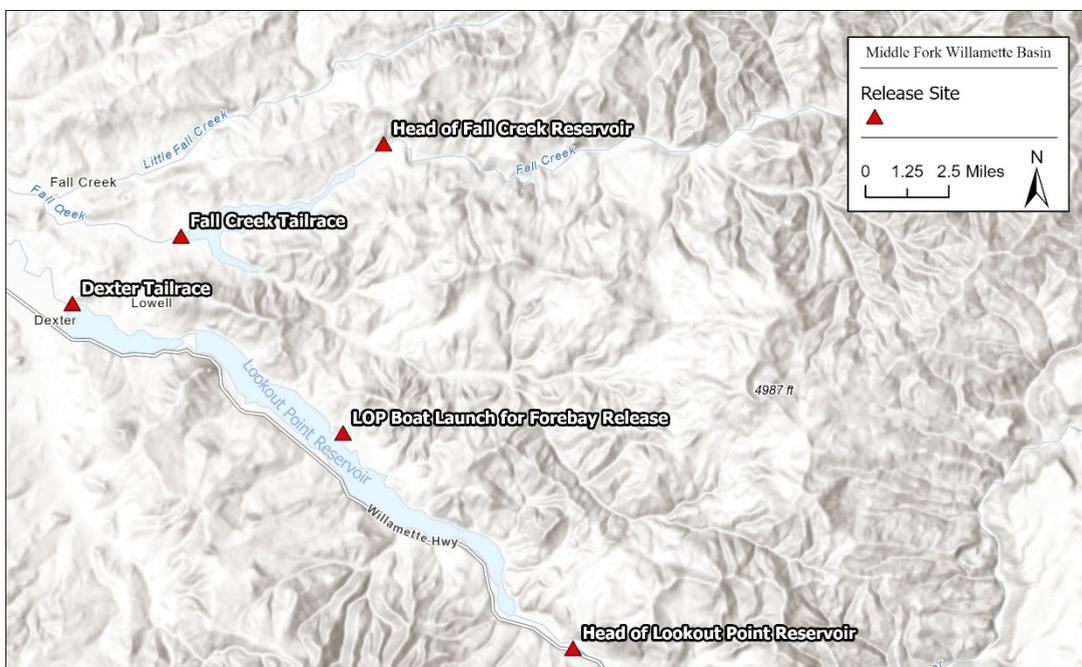


Figure 1. Map of Lookout Point, Dexter tailrace and Fall Creek release locations within the Middle Fork Willamette Basin.

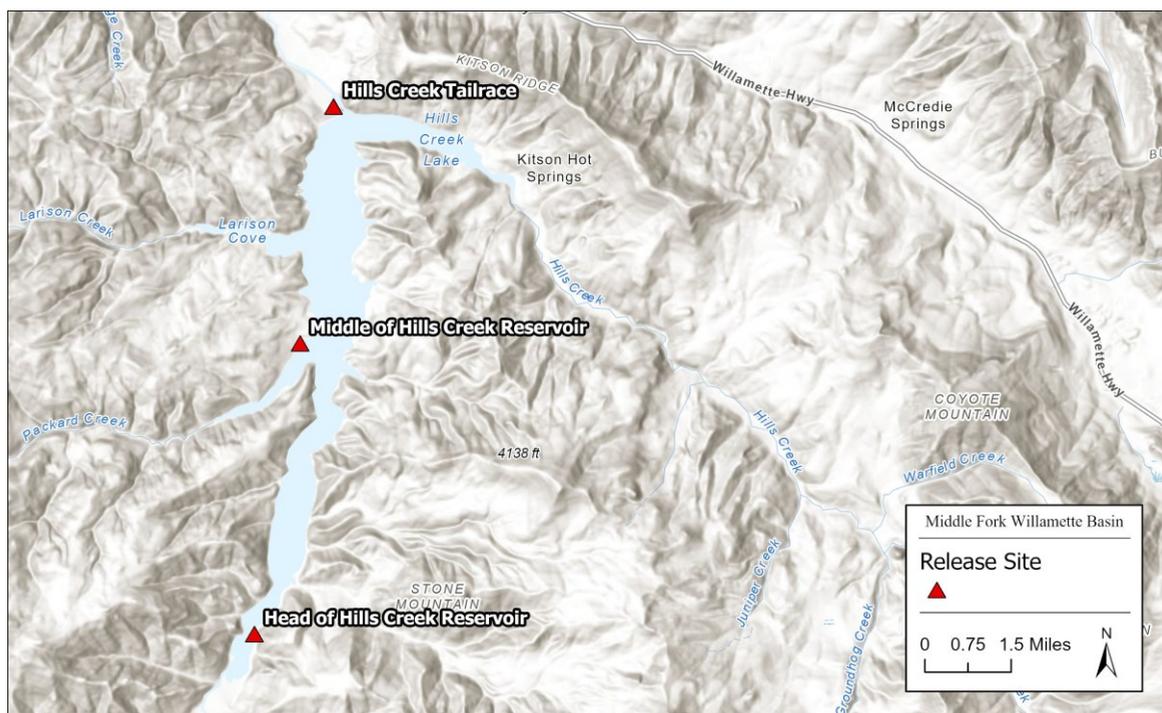


Figure 2. Map of Hills Creek Reservoir release locations within the Middle Fork Willamette Basin.

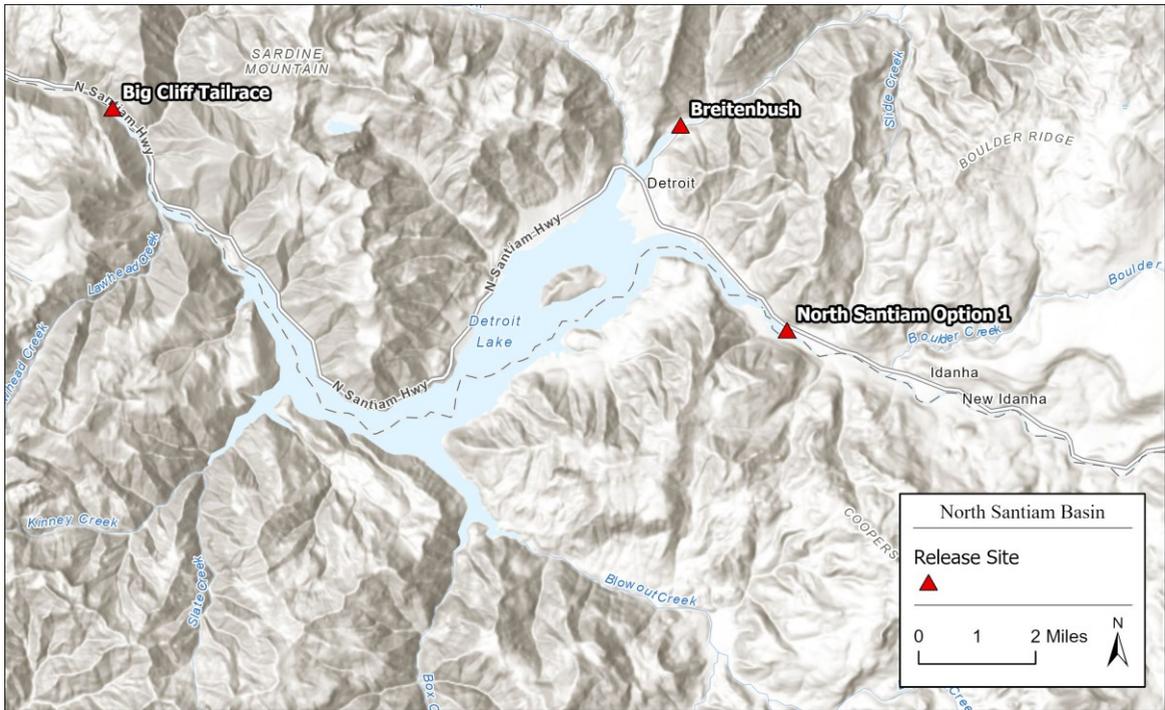


Figure 3. Map of release locations within the North Santiam Basin.

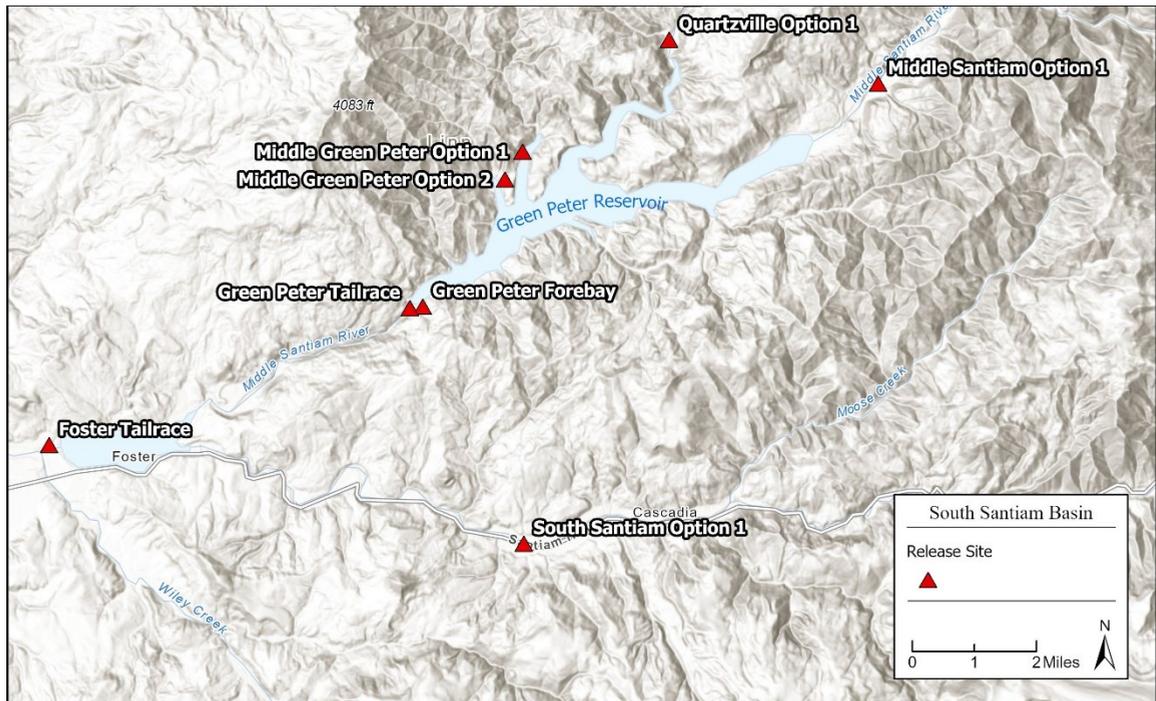


Figure 4. Map of release locations in the Middle/South Santiam basin including Green Peter Reservoir.

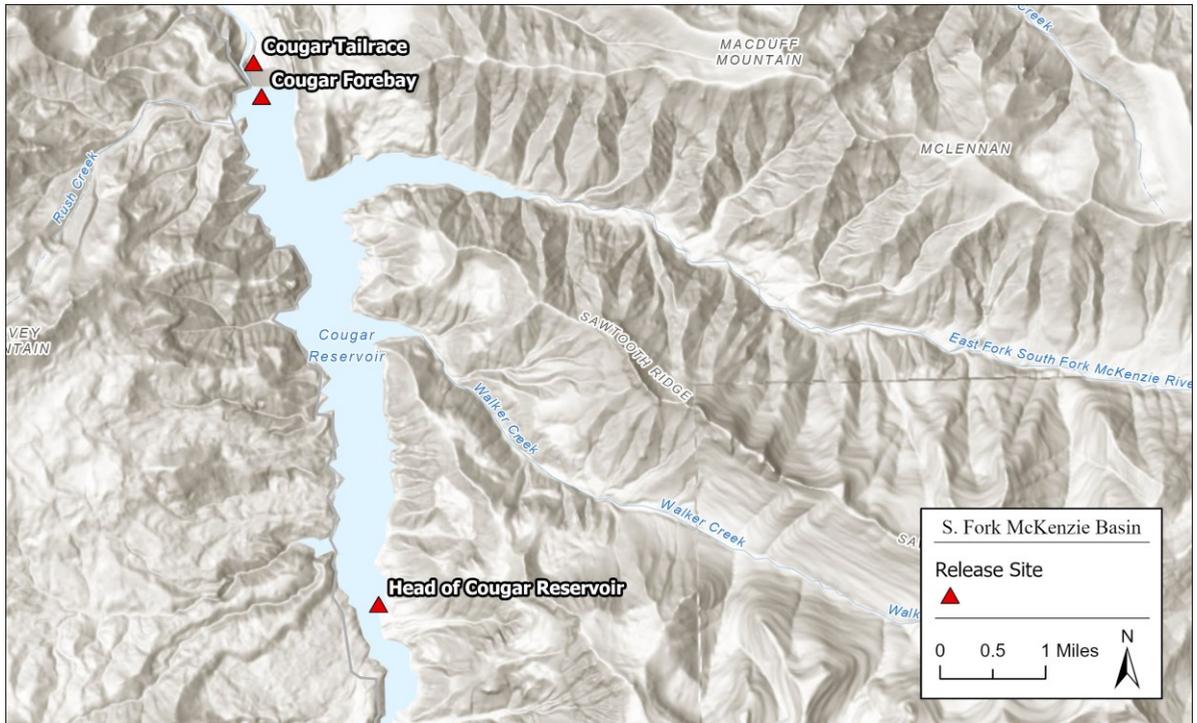


Figure 5. Map of release locations at Cougar Reservoir.

Appendix B. Reservoir Sampling Zones

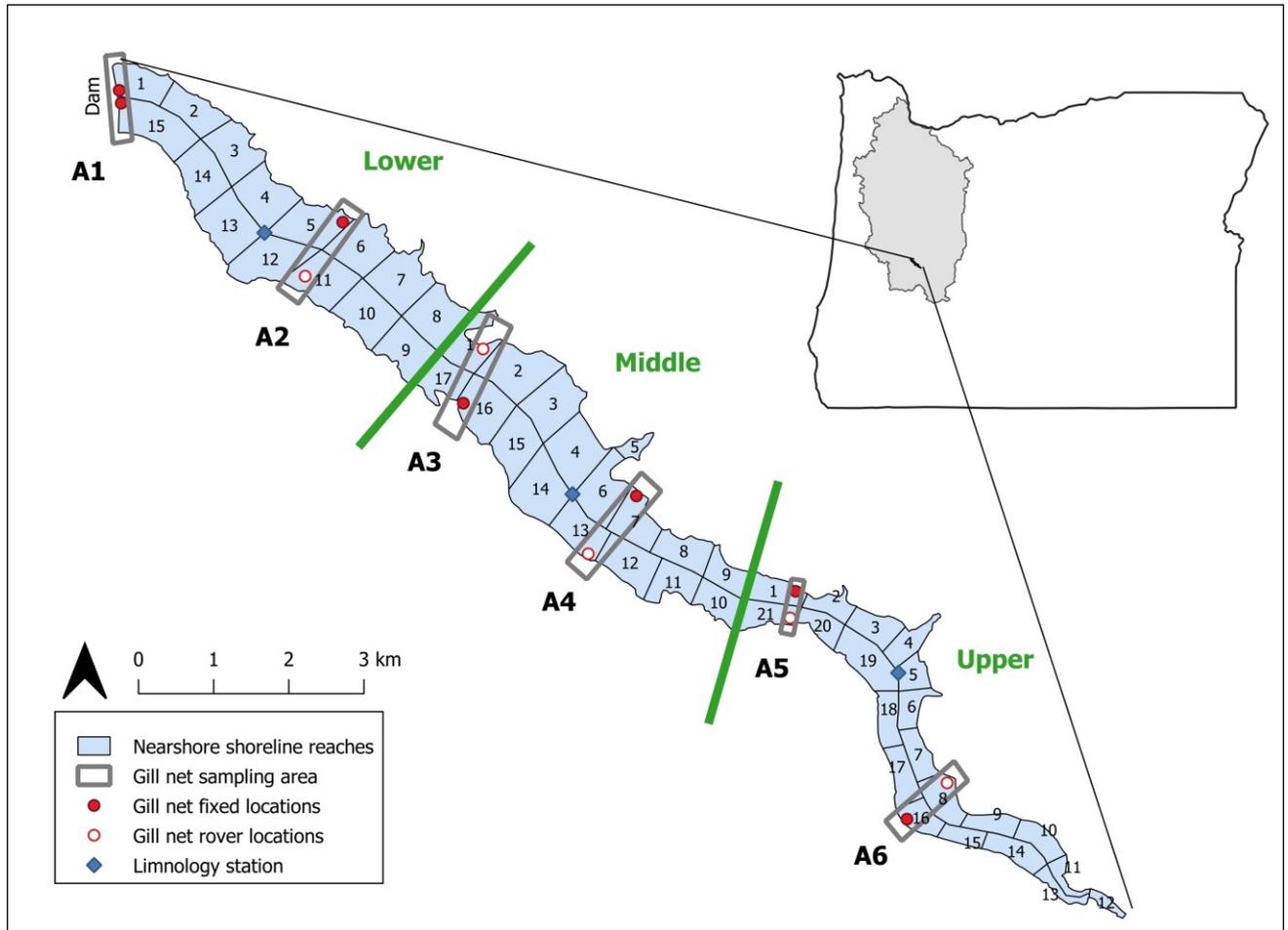


Figure 6. Map of Lookout Point Reservoir nearshore shoreline reaches, reservoir zones (lower, middle and upper), gill netting sampling areas and limnological stations.

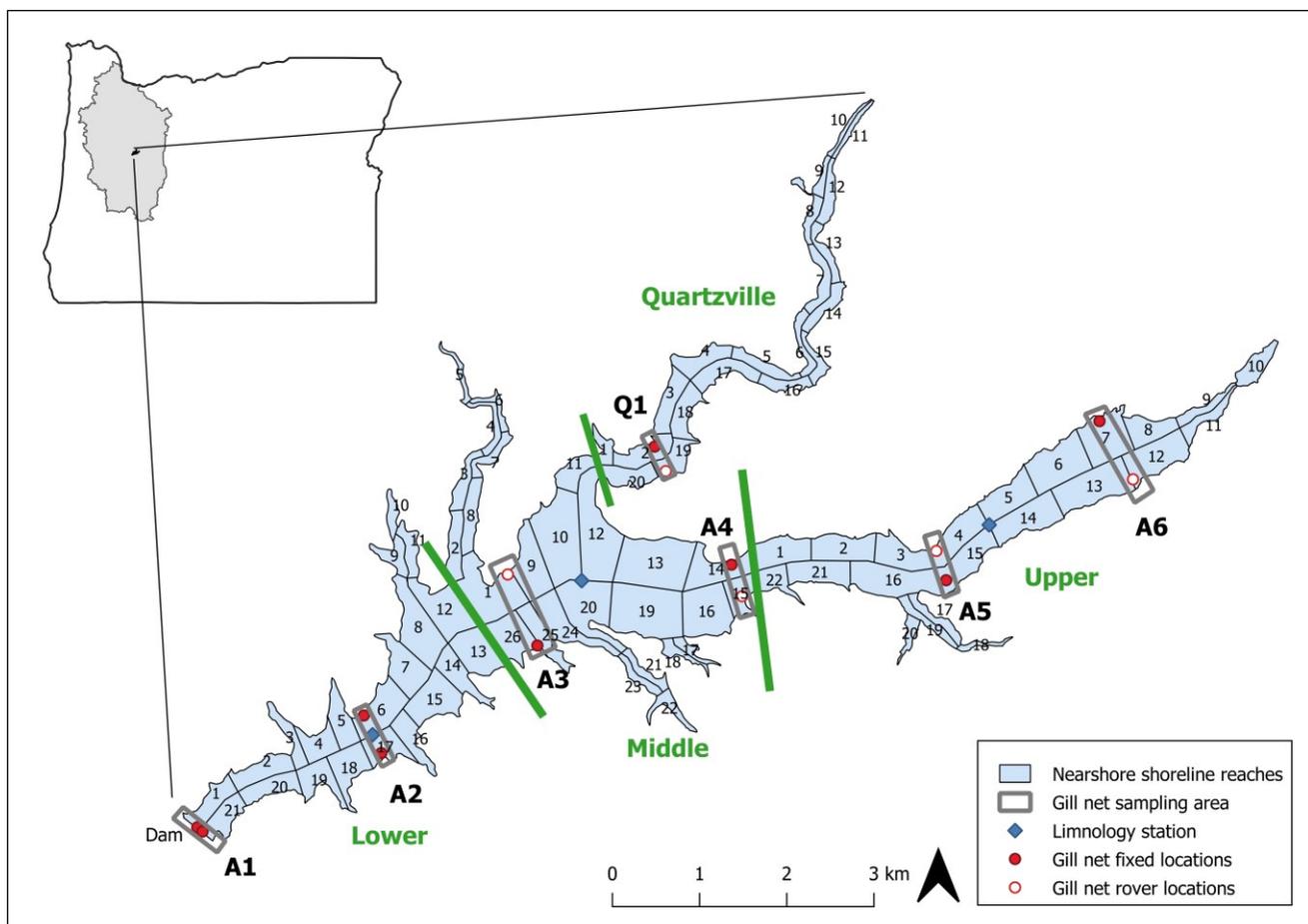


Figure 7. Map of Green Peter Reservoir nearshore shoreline reaches, reservoir zones (lower, middle and upper), gill netting sampling areas and limnological stations.