

# WILLAMETTE VALLEY FISH PASSAGE MONITORING – BULK MARKING & RESERVOIR DISTRIBUTION

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Bi-Weekly Report: December 1, 2023 – December 15, 2023



*Prepared for: United States Army Corps of Engineers*

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December 22, 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 this reporting period, the bulk marking project completed tagging the brood year 2022 Middle Fork Willamette stock that were a part of the original study (i.e., not including the additional 51,000 fish that were added as a contract modification). After completing the Middle Fork Willamette group, we began tagging the brood year 2022 South Santiam stock that are slated to be released as yearlings during the spring of 2024 (Table 2). In total, there are 71,620 fish left to tag from the 2022 brood year (10,320 South Santiam stock, 10,300 McKenzie stock, and the additional 51,000 Middle Fork Willamette stock located at Dexter Ponds).

## Recaptures

A total of 255 PIT tagged juvenile Chinook salmon were recaptured or otherwise observed passing PIT tag arrays during this reporting period. The greatest number of observations occurred at the below Cougar Dam with 61 PIT tags recovered at the regulating outlet rotary screw trap and 49 PIT tags recovered in the powerhouse rotary screw traps. There were also relatively large numbers of recoveries below Hill Creek Dam with 49 recoveries at the regulating outlet tailrace rotary screw trap, and 46 at the powerhouse screw trap. We estimate that a total of 2,527 PIT tagged fish from this project have been detected so far this year (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	Mor ts	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 and Spring 2024	85,233	NA	NA	7/26/2023	12/7/2023	TBD	TBD	TBD	TBD
South Santiam Basin – Fall 2023 and Spring 2024	43,407	NA	NA	8/14/2023	12/20/2023	TBD	TBD	TBD	TBD
McKenzie Basin – Fall 2023	36,001	NA	NA	8/30/2023	9/11/2023	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	Transport Temp End	Release Site Temp
Green Peter Head of Reservoir - Quartzville Creek Arm	5/22/2023 14:35	5,203	12	13.2	18
Green Peter Head of Reservoir - Middle Santiam Arm	5/22/2023 20:35	5,071	11.9	12.9	18.3
Lookout Point Head of Reservoir - Black Canyon Boat Ramp	5/30/2023 10:35	9,741	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
Detroit Head of Reservoir - Breitenbush River	7/13/2023 9:35	7,000	11.5	11.5	12.5
Detroit Head of Reservoir - North Santiam River	7/13/2023 11:45	6,640	11.5	13.1	13

Release Location	Release Date	N	Transport Temp Start	Transport Temp End	Release Site Temp
Foster Tailrace	8/23/2023 16:40	1,031	12.7	11.7	10
Foster Head of Reservoir	8/24/2023 10:10	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	13.6
Lookout Point Forebay - Signal Point	9/18/2023 17:10	5,004	14	14.9	20.9
Dexter Dam 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
Detroit Head of Reservoir - Breitenbush River	9/26/2023 10:55	5,002	7.6	9.3	10.3
Detroit Head of Reservoir - North Santiam River	9/26/2023 16:10	4,999	6.9	8.9	10.5
Big Cliff Dam 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
Cougar Head of Reservoir	10/2/2023 14:25	5,006	10.5	9.9	8.3
Cougar Head of Reservoir	10/2/2023 19:10	3,006	8.8	9.1	8.7
Green Peter Head of Reservoir - Quartzville Creek Arm	10/3/2023 12:55	2,502	11	11.8	12.5
Green Peter Head of Reservoir - Middle Santiam Arm	10/4/2023 14:45	2,516	11.5	12.6	13.3
Green Peter Tailrace - Sunnyside	10/9/2023 16:10	4,002	11.5	16.1	18.1
Foster Head of Reservoir	10/10/2023 14:25	5,001	11.5	12.2	13.2
Foster Tailrace	10/11/2023 15:20	4,000	10.6	11.3	12
Cougar Head of Reservoir	10/18/2023 11:55	4,000	11.3	10	8
Cougar Forebay	10/18/2023 18:05	5,010	13.2	13.6	15.4
Cougar Tailrace	10/19/2023 12:45	4,000	11.2	11.7	10.5
Fall Creek Head of Reservoir	11/6/2023 15:45	5,000	10.1	10.8	10.8
Fall Creek Dam Tailrace	11/6/2023 19:05	1,000	9.4	9.4	11.3
Hills Creek Head of Reservoir - Bingham Boat Ramp	11/7/2023 15:50	5,000	9.2	9.3	8.7
Hills Creek Mid Reservoir - Packard Creek Boat Ramp	11/8/2023 15:20	5,000	7.7	12.3	14.3
Hills Creek Dam Tailrace	11/9/2023 14:40	3,000	7	10.5	12.5
Cougar Head of Reservoir	11/13/2023 13:15	4,005	9.1	9.3	8

Release Location	Release Date	N	Transport Temp Start	Transport Temp End	Release Site Temp
Cougar Forebay	11/14/2023 15:15	5,000	8.9	9.3	8.1
Cougar Tailrace	11/15/2023 11:45	2,412	9	9.3	8.4
Big Cliff Tailrace – Packsaddle Boat Ramp	11/20/2023 16:50	5,998	4.5	8.5	10.5

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	Total	Reporting Period
Cougar Dam-RO	1,547	61
Hills Creek Dam-RO	87	49
Hills Creek Dam-PH	70	46
Cougar Dam-PH 1	43	41
Lookout Dam Tailrace-Spill	16	11
Dexter Dam Tailrace-5 ft	19	9
Cougar Dam-PH 2	10	8
Lookout Dam Tailrace-PH 1	11	8
LD2 - Lebanon Dam North Ladder	42	7
LD3 - Lebanon Dam Diversion Bypass	74	4
Lookout Dam Tailrace-PH 2	4	4
LD1 - Lebanon Dam South Ladder	44	3
PD7 - Columbia River Estuary rkm 70	18	2
Big Cliff Dam-8 ft	7	1
LD4 - Lebanon Dam Spillway	22	1
CGR - Cougar Dam	1	0
Cougar Dam Head of Reservoir-5 ft	3	0
DEX - Dexter Dam (USACE), Middle Fork Willamette River	2	0
Detroit Head of Reservoir- North Santiam River-5 ft	1	0

FAL - Fall Creek Dam (USACE), MF Willamette River	1	0
Fall Creek Dam Tailrace-8 ft	434	0
Green Peter Tailrace - Middle Santiam River-8 ft	33	0
HCR - Hills Creek Dam, Middle Fork Willamette River	14	0
Lookout Point Head of Reservoir-5 ft	1	0
NSANTR - North Santiam River, Oregon	23	0

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## Reservoir Distribution Summary

Reservoir sampling during the reporting period (12/03/2023-12/09/2023) was conducted using 30' small mesh suspended gill nets on Lookout Point Reservoir (Table 5). Sampling was not conducted once again on Green Peter Reservoir during this period due to access remaining unsafe. Over the weekend (12/02/2023-12/03/2023) prior to the sampling week, Lookout Point Reservoir experienced a rapid elevation increase of approximately 30 ft in response to dam operations for flood control. A large quantity of woody and other debris was observed floating on the surface on the reservoir.

Surface temperatures at netting locations averaged 9.0 C during week 49 (12/03/2023-12/09/2023) (Table 6). Turbidity remained high throughout the reservoir with secchi disk measurements averaging 0.22 m. Suspended gill nets were set at a range of depths (0m-2m, 4m-6m, 9m-11m, 12-14m) now that the target thermocline temperature (15 C) could not be sampled due to the breakdown of thermal stratification and lowering temperatures. Over four days of sampling and a total effort of 827.3 hours (Table 5), zero fish were captured in the suspended gillnets during the reporting period.

This was the final week of sampling for the reservoir distribution study of the 2023 field season. With rising reservoir surface elevations, CFS was able to access the Signal Point boat ramp on December 13, 2023, and remove the Hewes Craft boat and all sampling equipment from Lookout Point Reservoir for winter storage.

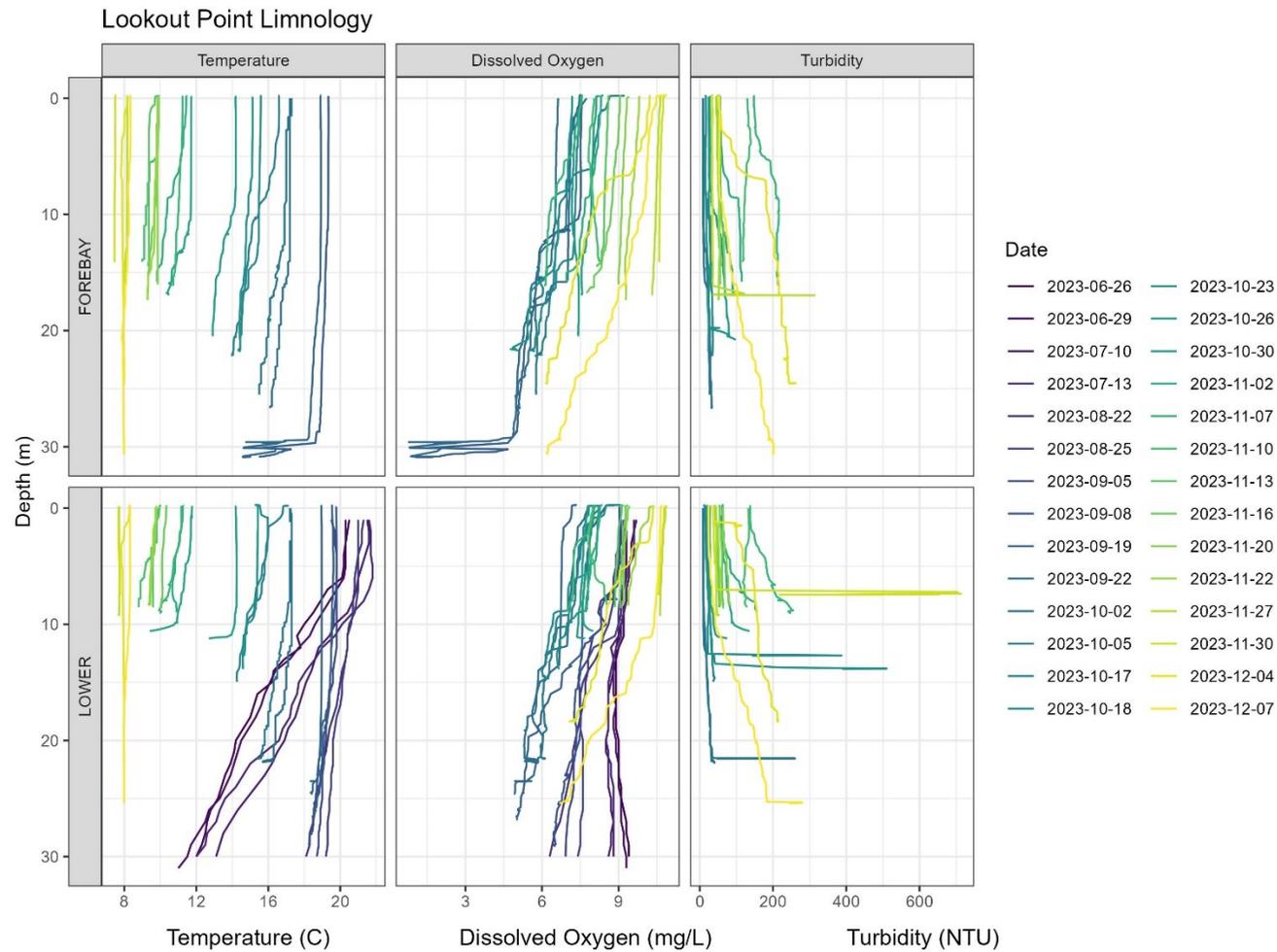


Figure 1. Temperature, dissolved oxygen and turbidity profiles taken in the forebay and at the “lower” limnology station in Lookout Point Reservoir.

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'	545.1 hours
40	10/01/2023	10/07/2023	Lookout Point	Gill Net – 30'	548.6 hours
41	10/08/2023	10/14/2023	NA	NA	0 hours
42	10/15/2023	10/21/2023	Lookout Point	Gill Net – 30'	563.5 hours
43	10/22/2023	10/28/2023	Lookout Point	Gill Net – 30'	573.5 hours
44	10/29/2023	11/04/2023	Lookout Point	Gill Net – 30'	567.1 hours
45	11/05/2023	11/11/2023	Lookout Point	Gill Net – 30'	566.4 hours
46	11/12/2023	11/18/2023	Lookout Point	Gill Net – 30'	844.3 hours
47	11/19/2023	11/25/2023	Lookout Point	Gill Net – 30'	579.9 hours
48	11/26/2023	12/02/2023	Lookout Point	Gill Net – 30'	571.3 hours
49	12/03/2023	12/09/2023	Lookout Point	Gill Net – 30'	827.3 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
27	Green Peter	24.1
28	Lookout Point	23.3
29	NA	NA
30	NA	NA

<b>Week</b>	<b>Reservoir</b>	<b>Mean Water Surface Temperature °C</b>
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
40	Lookout Point	17.9
41	NA	NA
42	Lookout Point	16.1
43	Lookout Point	14.5
44	Lookout Point	11.9
45	Lookout Point	10.7
46	Lookout Point	10.7
47	Lookout Point	10.2
48	Lookout Point	8.2
49	Lookout Point	9.0

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.

<b>Week</b>	<b>Reservoir</b>	<b>Species</b>	<b>Catch</b>
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

<b>Week</b>	<b>Reservoir</b>	<b>Species</b>	<b>Catch</b>
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
40	Lookout Point	BLC	1
40	Lookout Point	CHS	1
40	Lookout Point	WAL	25
40	Lookout Point	WHC	1
42	Lookout Point	CHS	1
42	Lookout Point	WAL	18
43	Lookout Point	BLC	1
43	Lookout Point	CHS	2
43	Lookout Point	WAL	35
43	Lookout Point	WHC	2
44	Lookout Point	WAL	9
44	Lookout Point	WHC	1
45	Lookout Point	WAL	4
46	Lookout Point	CHS	5
46	Lookout Point	UNK	1

Week	Reservoir	Species	Catch
47	Lookout Point	BLC	1
47	Lookout Point	WAL	1
47	Lookout Point	WHC	1
48	Lookout Point	CHS	1

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
40	Lookout Point	UPPER	CHS	1	140	140	140
42	Lookout Point	MIDDLE	CHS	1	159	159	159
43	Lookout Point	LOWER	CHS	1	130	130	130
43	Lookout Point	LOWER	CHS	1	139	139	139
46	Lookout Point	LOWER	CHS	6	130	151.8	202
48	Lookout Point	LOWER	CHS	1	144	144	144

## Appendix A. Release Site Maps

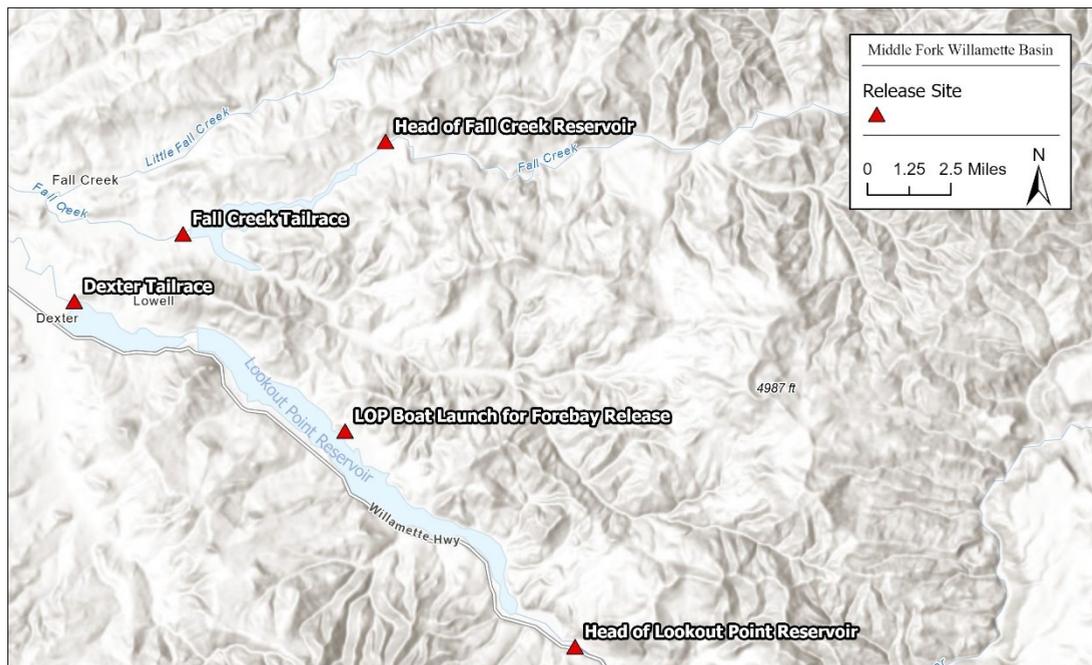


Figure 1. Map of Lookout Point, Dexter tailrace and Fall Creek release locations within the Middle Fork Willamette Basin.

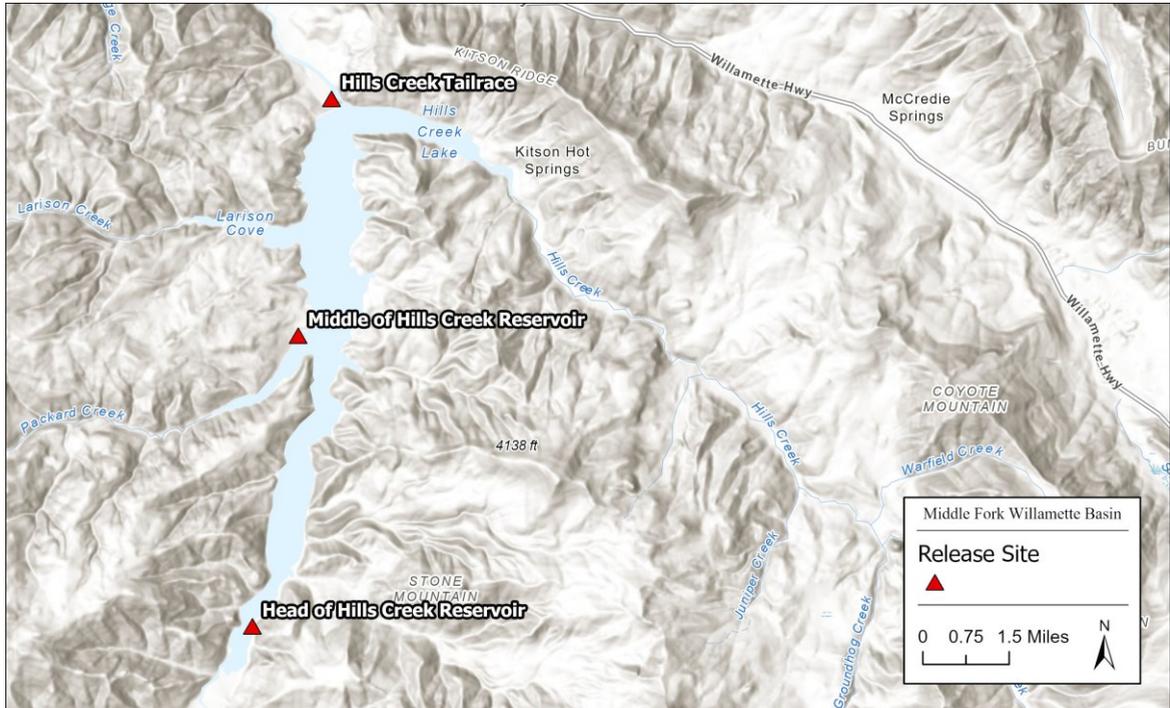


Figure 2. Map of Hills Creek Reservoir release locations within the Middle Fork Willamette Basin.

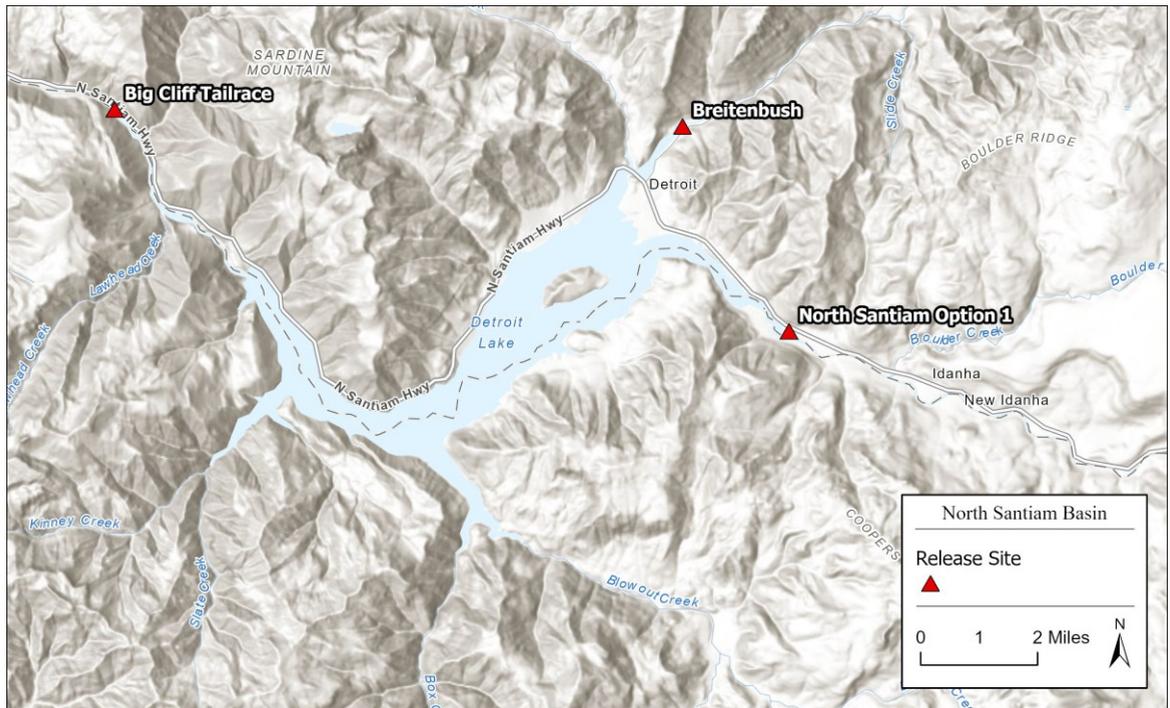


Figure 3. Map of release locations within the North Santiam Basin.

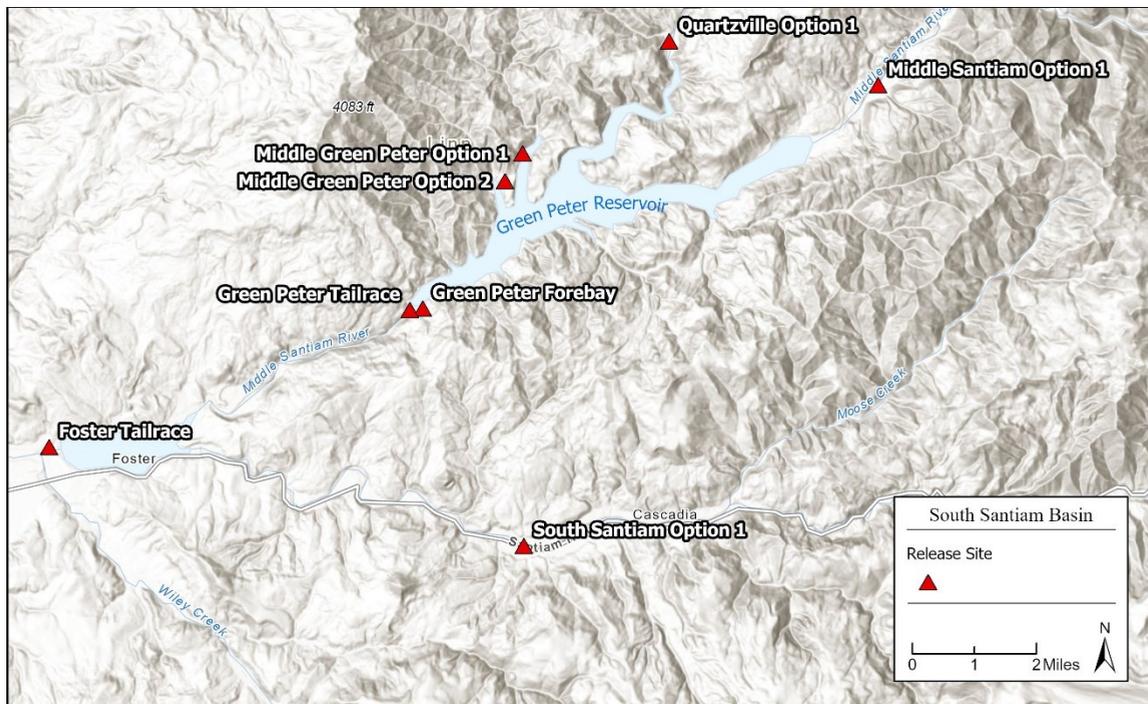


Figure 4. Map of release locations in the Middle/South Santiam basin including Green Peter Reservoir.

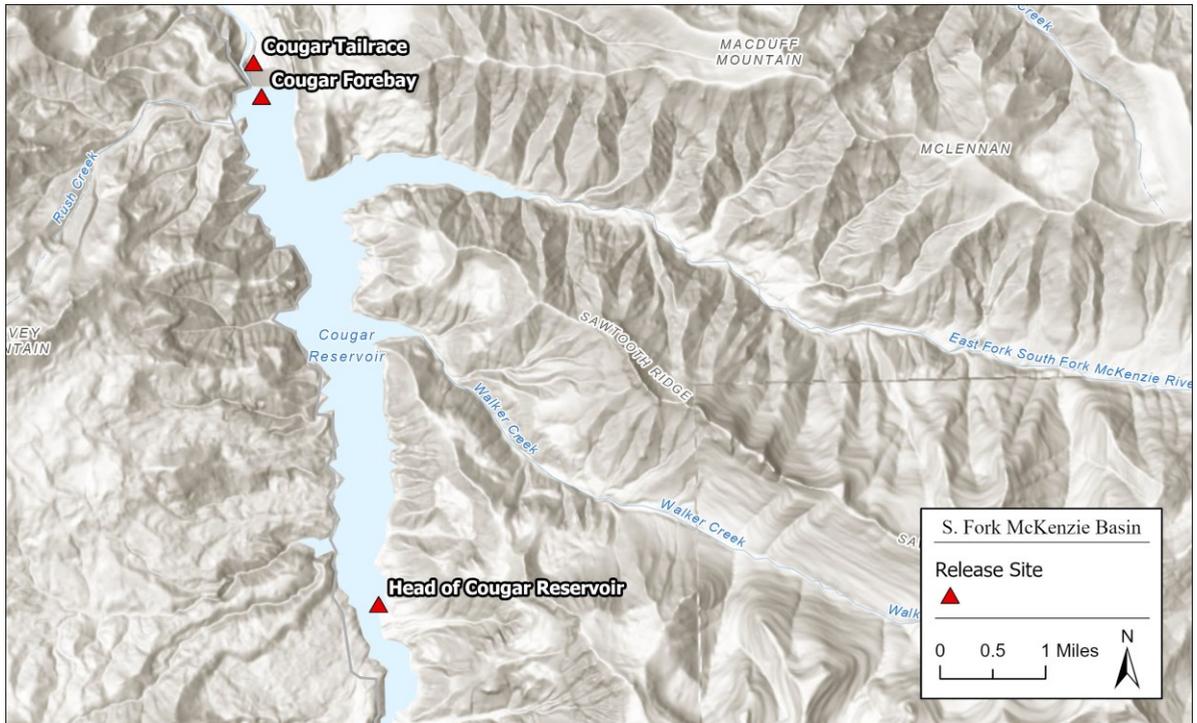


Figure 5. Map of release locations at Cougar Reservoir.

## Appendix B. Reservoir Sampling Zones

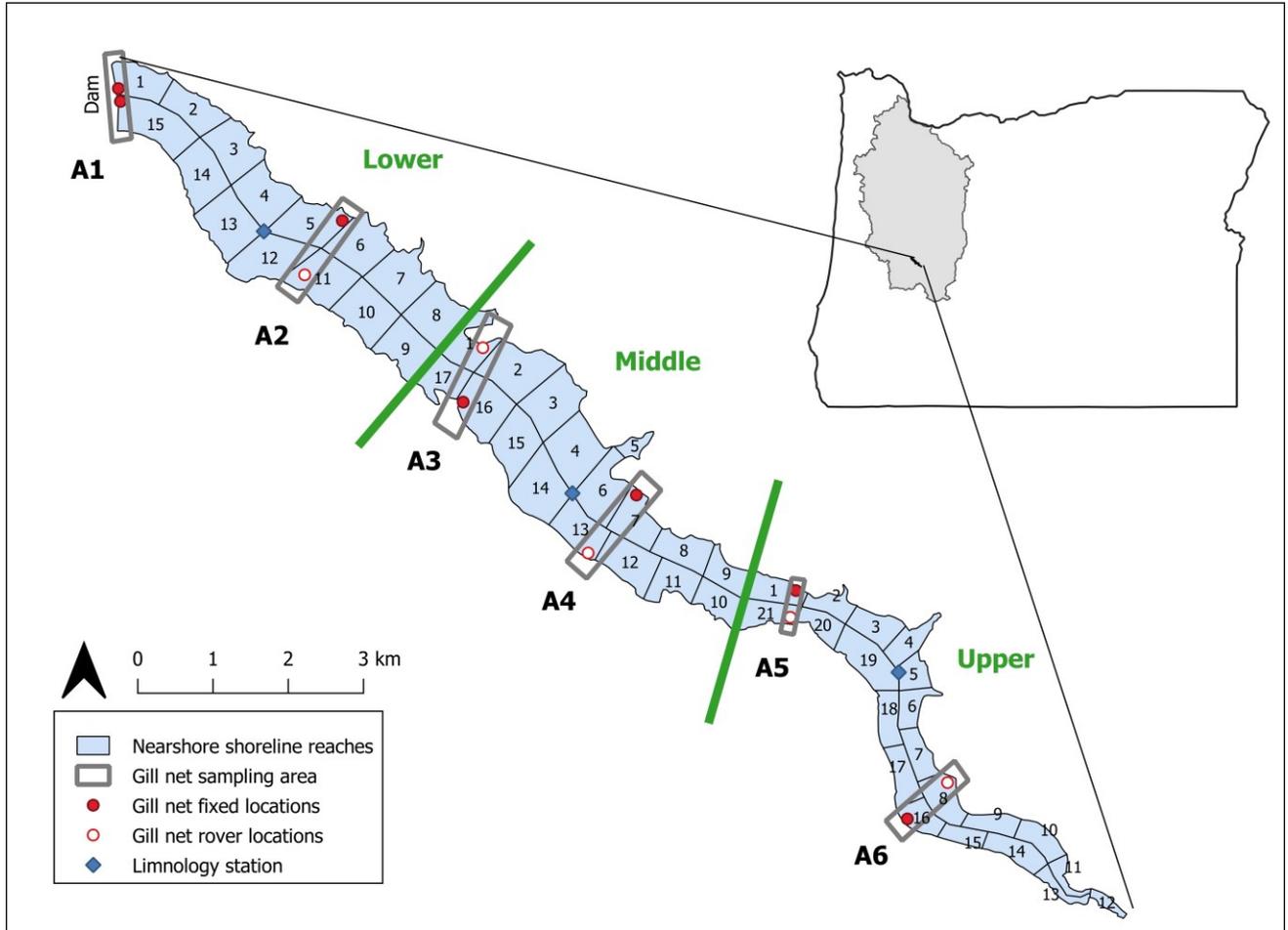


Figure 6. Map of Lookout Point Reservoir nearshore shoreline reaches, reservoir zones (lower, middle and upper), gill netting sampling areas and limnological stations.

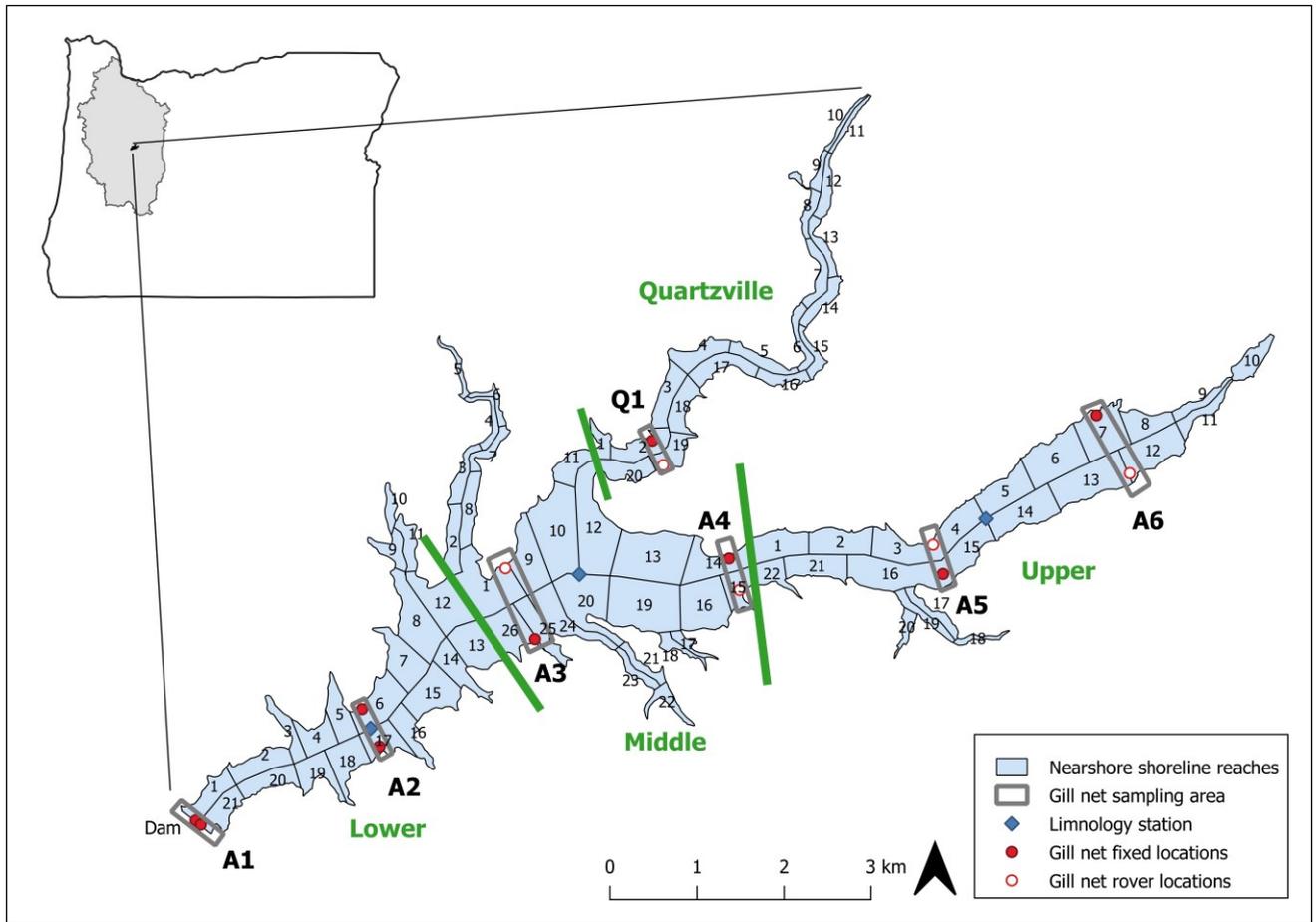


Figure 7. Map of Green Peter Reservoir nearshore shoreline reaches, reservoir zones (lower, middle and upper), gill netting sampling areas and limnological stations.