

THE OREGON PLAN for Salmon and Watersheds



**Western Oregon Adult Coho Salmon,
2023 Spawning Survey Data Report**

Report Number: OPSW-ODFW-2024-3



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SUMMARY

This report provides a summary of results from Coho Salmon, *Oncorhynchus kisutch*, spawning ground surveys conducted in Lower Columbia (Oregon side only) and Oregon Coast basins during the 2023-24 spawning season. For a discussion of the history, goals and methods of this long-term monitoring effort see prior reports (e.g., Sounhein et al. 2017). Results in this report are based on data from randomly selected spawning ground surveys as well as alternative methods in areas without random sampling. Results for Coho Salmon standard spawning ground surveys and spawning surveys for other species are covered in data summaries and reports posted on an Oregon Department of Fish and Wildlife (ODFW) web page.

(see: <https://odfw-oasis.forestry.oregonstate.edu/>).

Long-term monitoring of Coho Salmon spawners in the Oregon portion of the Southern Oregon/Northern California Coast (SONCC) Evolutionarily Significant Unit (ESU) currently relies on seining at Huntley Park in the lower Rogue River (river mile 8) and standard spawning ground surveys in other coastal basins. The ODFW monitoring in the SONCC ESU is described in the Rogue–South Coast Multi-Species Conservation and Management Plan (RSP - ODFW 2021b), which was approved by the Oregon Fish and Wildlife Commission on December 17, 2021. In 2023, the 1996 to 2021 run year Rogue adult Coho Salmon estimates were recalculated to match the Coho Salmon abundance estimation methods as described in Appendix III of the RSP (ODFW 2021b). This method provides an estimate of adult Coho Salmon in the Rogue Basin at Huntley Park. In the past, the Huntley Park estimates (adjusted to account for harvest and hatchery operations above Huntley Park) were included in this report series. Beginning with the 2021 run year these Coho Salmon abundance estimates will be reported under the RSP and posted on an ODFW web page.

(see: https://www.dfw.state.or.us/fish/CRP/rogue_south_coast_multi-species_conservation%20and%20Management_plan.asp).

Wild adult Coho Salmon spawner abundance in 2023 was the highest ever recorded since monitoring began (2002) in the Lower Columbia River (LCR) ESU. In the Oregon Coast (OC) ESU, wild abundance was down from the previous year, but still 119% of the previous 33-year average. In the Oregon portion of the LCR ESU, sufficient surveys were conducted to meet the estimate precision goal at one of three strata. In the OC ESU, sufficient surveys were conducted to meet the precision goal for the ESU; two of four strata, and one of 19 populations where estimates were generated.

INTRODUCTION AND METHODS

Monitoring of Western Oregon adult Coho Salmon occurs at three hierarchical spatial scales: Evolutionary Significant Unit; stratum; and population. There are three Coho Salmon ESUs located entirely or partially within the State of Oregon: the Lower Columbia River ESU, the Oregon Coast ESU, and the Southern Oregon/Northern California Coast ESU. Boundaries and population structures of the ESUs are presented in Figure 1. This report summarizes results for Coho Salmon populations within the ESU boundaries that Oregon encompasses.

A brief history of sampling designs is available in ODFW status reports (e.g., Sounhein et al. 2017) from prior years. Field methods for establishing and conducting salmon spawning ground surveys are described in ODFW procedures manuals (ODFW 2019, ODFW 2021a). The trapezoidal Area-Under-the-Curve (AUC) technique is used to estimate the number of adult Coho Salmon spawning in each stream segment throughout the spawning season (Jacobs et al. 2002). A more detailed description of how spawner estimates are derived, the criteria used for determining if sites are included in the estimate, methods for determining the proportion of hatchery origin spawners (pHOS) in naturally spawning populations, and the analysis methods for other metrics included in this report can also be found in prior years ODFW status reports.

In areas where surveys are not conducted, other sources of monitoring data are used to document the number of adult Coho Salmon spawners. These include dam counts, mark-recapture estimates, and regressions of standard survey data to abundance estimates. Historically, there have been five such locations in the LCR ESU including: one dam (River Mill on the Clackamas River), three hatchery weirs (Big Creek, Klaskanine, and Sandy hatcheries), and one life-cycle monitoring site (Bonnie Falls Trap on North Scappoose Creek). In these locations, counts of adult Coho Salmon passed up-stream are added to the estimated abundance of Coho Salmon spawners below the facilities. Starting in 2020, the area above the Bonnie Falls trap location has been included in the regular spawning survey effort.

In the OC ESU, random spawning ground surveys are conducted in most areas, except for the North Umpqua River above Winchester Dam and above the Alsea Hatchery weir. Winchester Dam counts and results of surveys below the dam are used to document the number of adult Coho Salmon spawners in the North Umpqua population. The Winchester Dam count is adjusted for angler harvest of Coho Salmon in the North Umpqua River above Winchester Dam. Prior to 2020, when Rock Creek Hatchery was still in operation, the Winchester Dam count was also adjusted for Coho Salmon collected and retained at Rock Creek Hatchery. The count of Coho Salmon passed above the Alsea Hatchery weir is added to the spawning survey estimate for the Alsea population. Coho Salmon spawner abundances for the Lakes stratum are calculated using regressions of long-term standard surveys to historic mark-recapture studies and habitat measurements for those locations (Jacobs et al. 2002).

In addition to the surveys used in the abundance estimates, “calibration” surveys were conducted in the Mill Creek-Yaquina sub-basin to test the accuracy of survey-based AUC estimates. The purpose of these surveys is to compare known passage counts with survey-based AUC estimates using a Generalized Random Tessellation Stratified (GRTS) survey site selection methodology.

RESULTS

Results include data from random spawning ground surveys and data from other sources where random surveys are not conducted. Results are presented in Bullets, Tables and Figures. Results are summarized by Coho Salmon ESU, in four categories: Survey Effort, Spawner Abundance, Distribution and Timing, and Hatchery Proportion. Spatially, results are reported by ESU, stratum, and constituent Coho Salmon populations. The individual components that comprise the results can be found in Appendices A, B, and C (by Coho Salmon ESU). Ancillary data is presented in Appendix D.

Stream flow levels in the LCR and OC ESUs during the 2023 season started below average for October through November, then increased to above average for December through January, before dropping sharply into February. In all areas there was a flow peak in early December followed by average flows until more consistently high flows throughout much of January. Temperatures were generally above average for most of the season. Only in the LCR did temperatures dip below average in January. Precipitation was generally below average to begin the season, near normal in late November and above average from mid-December through January. Overall, weather patterns in the second half of the season were not conducive to successful surveying. In 2023, the unsuccessful survey rate was greater than the previous 10-year average rate (plus one standard deviation) for most of the LCR and OC ESU's. In virtually all areas relaxed inclusion criteria were used to determine which sites were used in abundance estimates. (Appendix Table D-4). Generally good adult coho carcass recoveries in 2023 resulted in adequate sample sizes for determining PHOS. Thus, standard criteria were used in 20 of 28 populations for which surveys were selected (Appendix Table D-3).

Survey Effort

Lower Columbia River ESU

- Survey effort was up in 2023 compared to the previous 9-year average (Table 1). More than 100 sites were successfully surveyed for the first time since 2019.
- The percentage of sites successfully surveyed was greater than the prior 9-year average (Table D-1).
- No surveys have been conducted in the Youngs Bay and Big Creek populations since 2013.
- Overall, survey conditions were amenable to project protocols, and relatively few surveys had to be excluded from the abundance estimates (see No AUC rate in Table D-5). The exception was the Sandy population, where greater than 11% of sites did not meet inclusion criteria.

Oregon Coast ESU

- The percentage of sites successfully surveyed was lower than the 9-year average (Table D-2).
- Survey conditions were adverse during the second half of the season and many sites had larger than normal gaps between survey dates. A relaxed criteria was used to assess sites

for inclusion in abundance estimates. After this process, relatively few sites had to be excluded from the abundance estimates (see No AUC rate in Table D-5).

Southern Oregon/Northern California Coast ESU

- No random (GRTS) coho spawning ground surveys have been conducted since the 2008 season in the SONCC ESU. Randomly selected spawning surveys targeting Coho Salmon were conducted across the ESU from 1996 through 2008.

Spawner Abundance

Lower Columbia River ESU

- Total wild adult coho spawner abundance in 2023 (26,642) was the highest ever recorded since monitoring began in 2002, the second year in a row with a record high (Table 3 and Figure 2).
- Wild adult coho spawner abundance in 2023 was above average in four of the six populations that were monitored. Only in the Scappoose and Hood populations was abundance below the previous 20-year average (Table 3).
- Approximately 75% of the wild abundance in the Lower Columbia River ESU was driven by the Clackamas population estimate (Table 3), and approximately 96% of the Clackamas population abundance was determined by counts of wild coho passed above River Mill Dam (Table A-2). The 2023-24 count is the highest recorded since monitoring began in 1957.

Oregon Coast ESU

- Total wild adult coho spawner abundance in 2023 (153,006) was 119% of the previous 33-year average (Table 6 and Figure 5).
- Abundance in 2023 was above average in four of the five monitoring strata. Only the Lakes strata was slightly below average (Table 6).
- Population scale estimates were generated in the North Coast stratum for the first time in 3-years (Table 4 and Table 6).
- Wild adult coho spawner abundance in 2023 was above average in 13 of the 24 populations where population scale estimates were produced (Table 6).

Calibration Sites

- For the first time in 10 years, no random coho surveys were conducted in the Mill Creek (Siletz) sub-basin.
- In 2023, the Mill Creek (Yaquina) sub-basin AUC estimate was 68% of the dam count, well below the 10-year average of 75% (Table 7).

Distribution and Timing

Lower Columbia River ESU

- Spawn timing in 2023 was near average, peaking in early November, with a second, smaller peak, in early December (Figure 4).
- The proportion of sites occupied by coho in 2023 was above the prior 9-year average in all but the Hood River population (Table 2).
- The proportion of sites occupied by wild coho in 2023 was also above the prior 9-year average in all but the Hood River population (Table 2).
- Wild occupancy for the ESU was 132% of the prior 9-year average (Table 2).

Oregon Coast ESU

- Spawn timing in 2023 was near normal to begin the season, then dropped off quickly after mid-December. Very little spawning was observed into January (Figure 8).
- Total coho and wild coho site occupancy results were very similar. Wild coho site occupancy in 2023 was above average for the ESU, and all four strata (Table 5).

Hatchery Proportion

Lower Columbia River ESU

- Sample sizes for pHOS estimation at the population scale were sufficient in most areas.
- The 2023 proportion of hatchery coho on spawning grounds in the ESU was 6.8%, well below the 21-year average of 21.6% (Table 3). However, the 2023 results do not include two populations, Youngs Bay and Big Creek, which typically contribute a sizable portion of hatchery spawners to the ESU total.
- No hatchery coho were observed in the Scappoose and Sandy populations, while the Hood River population was estimated to be comprised of all hatchery coho (Table 3).
- In the LCR ESU, pHOS has consistently been below 12% since 2014 (Figure 2).

Oregon Coast ESU

- Sample sizes for pHOS estimation at the population scale were sufficient in most areas.
- The 2023 proportion of hatchery coho on spawning grounds in the ESU was 0.5%, well below the 33-year average of 8.7% (Table 6).
- At the population and strata scale, pHOS was near or below the 33-year average in all cases (Table 6).
- In the OC ESU, pHOS has consistently been below 3% since 2008 (Figure 5).

REFERENCES

- Jacobs, S., J. Firman, G. Susac, D. Stewart, and J. Weybright. 2002. Status of Oregon coastal stocks of anadromous salmonids, 2000-2001 and 2001-2002; Monitoring Program Report Number OPSW-ODFW-2002-3, Oregon Department of Fish and Wildlife, Salem, Oregon.
- ODFW. 2019. Site verification manual, Oregon Adult Salmonid Inventory and Sampling Project (OASIS) 2019. Oregon Department of Fish and Wildlife, Salem, Oregon.
Available: <https://odfw.forestry.oregonstate.edu/spawn/reports.htm>
- ODFW. 2021a. Salmon spawning surveys procedures manual 2021. Oregon Department of Fish and Wildlife, Salem, Oregon.
Available: <https://odfw.forestry.oregonstate.edu/spawn/reports.htm>
- Oregon Department of Fish and Wildlife. 2021b. Rogue–South Coast Multi-Species Conservation and Management Plan. December 2021. Oregon Department of Fish and Wildlife, Salem, Oregon.
- Sounhein, B., E. Brown, M. Lewis and M. Weeber. 2017. Status of Oregon stocks of Coho Salmon, 2016. Monitoring Program Report Number OPSW-ODFW-2017-3, Oregon Department of Fish and Wildlife, Salem, Oregon.

Table 1. Lower Columbia River ESU, GRTS spawning survey goals and results for number of surveys and 95% C.I., 2023 run year. Target response sites are reaches within Coho Salmon spawning habitat which were successfully surveyed.

Stratum	Population	Goal	Target response				95% CI as percent of point estimate (goal is +/- 30%)			
			2023	2014 to 2022			2023	2014 to 2022		
				Avg.	Min.	Max.		Avg.	Min.	Max.
Coast	Youngs Bay	0	0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Big Creek	0	0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Clatskanie	18	27	21	12	27	32%	38%	21%	74%
	Scappoose	20	19	14	8	18	37%	70%	46%	103%
	Total	38	46	35	27	40	24%	39%	24%	72%
Cascade	Clackamas	30	30	23	15	30	35%	68%	33%	110%
	Sandy	30	23	27	8	35	79%	49%	37%	66%
	Total	60	53	50	24	61	60%	39%	31%	44%
Gorge	Lower Gorge	2	2	2	0	6	84%	102%	9%	184%
	Hood	2	3	3	0	5	149%	79%	0%	191%
	Total	4	5	5	0	8	97%	70%	1%	108%
ESU Total		102	104	90	52	101	42%	29%	23%	36%

n.a. = Not available (no surveys were selected in the population, less than 2 surveys stayed in rotation, or the abundance estimate was 0).

Table 2. Lower Columbia River ESU adult Coho Salmon occupancy (total & wild) by population, stratum, and ESU for the 2023 run year and previous 9-year average (2014–22). Occupancy = a peak of 4 or more adult Coho Salmon per mile. Wild Occupied = occupied sites with at least one wild Coho Salmon. n.a = Not available, population was not monitored.

ESU, Stratum, and TRT Population	2023 No. sites surveyed	9 yr. avg. No. sites surveyed	Total Coho Salmon		Wild Coho Salmon	
			2023 % Occupied	9 yr. avg. % Occupied	2023 % Occupied	9 yr. avg. % Occupied
Lower Columbia R. ESU	104	92	61%	46%	60%	45%
Coast Stratum	46	35	65%	51%	65%	49%
Youngs Bay	0	0	n.a	n.a	n.a	n.a
Big Creek	0	0	n.a	n.a	n.a	n.a
Clatskanie River	27	22	78%	57%	78%	55%
Scappoose Creek	19	14	47%	42%	47%	41%
Cascade Stratum	53	52	55%	40%	53%	39%
Clackamas River	30	25	53%	30%	53%	30%
Sandy River	23	27	57%	48%	52%	46%
Gorge Stratum	5	5	80%	79%	80%	74%
Lower Gorge tribs.	2	3	100%	86%	100%	75%
Hood River	3	3	67%	79%	67%	79%

Table 3. Lower Columbia River ESU estimated abundance of adult Coho Salmon spawning naturally by ESU, stratum, and population in the 2023 run year compared to the previous 21-year average.

Geographic scale ESU/Stratum/Population		Spawning year			
		2023	2002 to 2022		
			Avg.	Min.	Max.
Lower Columbia River ESU (Oregon Only)	Wild	26,642*	8,703	2,988	23,373
	Hatchery	1,934*	2,488	285	12,230
	% Hat.	6.8%*	21.6%	2.4%	65.6%
Coast Stratum *	Wild	n.a.	1,836	1,140	3,993
	Hatchery	n.a.	838	89	3,420
	% Hat.	n.a.	27.8%	4.9%	74.4%
Youngs Bay *	Wild	n.a.	119	21	411
	Hatchery	n.a.	510	14	2,506
	% Hat.	n.a.	67.7%	21.9%	92.1%
Big Creek *	Wild	n.a.	300	98	792
	Hatchery	n.a.	317	66	936
	% Hat.	n.a.	46.0%	15.5%	89.8%
Clatskanie	Wild	890	817	25	3,246
	Hatchery	66	75	0	413
	% Hat.	6.9%	13.1%	0.0%	67.9%
Scappoose	Wild	660	678	178	1,960
	Hatchery	0	10	0	67
	% Hat.	0.0%	1.6%	0.0%	9.9%
Cascade Stratum	Wild	24,344	6,562	2,157	21,143
	Hatchery	540	1,397	139	10,871
	% Hat.	2.2%	17.3%	1.2%	71.2%
Clackamas	Wild	19,916	4,679	1,301	13,991
	Hatchery	540	1,300	50	10,871
	% Hat.	2.6%	20.0%	1.5%	75.8%
Sandy	Wild	4,428	1,883	382	7,152
	Hatchery	0	102	0	515
	% Hat.	0.0%	7.2%	0.0%	57.4%
Gorge Stratum	Wild	748	471	34	1,525
	Hatchery	1,328	727	25	2,555
	% Hat.	64.0%	49.8%	11.9%	74.7%
Lower Gorge Tribs.	Wild	748	284	16	920
	Hatchery	63	229	5	1,512
	% Hat.	7.8%	35.9%	0.9%	85.2%
Hood River	Wild	0	232	4	1,262
	Hatchery	1,265	511	0	1,717
	% Hat.	100.0%	55.6%	0.0%	96.6%

* = Does not include data for the Youngs Bay and Big Creek Populations. These populations were not sampled, 2013 through present run years. Also, the Lower Gorge and Hood populations were not sampled in 2017 and 2020.

Table 4. Oregon Coast ESU, GRTS spawning survey goals, responses, and estimate precision by population, 2023 run year. Target response sites are reaches within Coho Salmon spawning habitat which were successfully surveyed.

Stratum	Population	Goal	Target response				95% CI as percent of point estimate (goal is +/- 30%)			
			2023	2014 to 2022			2023	2014 to 2022		
				Avg.	Min.	Max.		Avg.	Min.	Max.
North Coast	Necanicum	13	11	13	6	18	38%	41%	22%	57%
	Nehalem	20	13	16	5	24	35%	44%	34%	64%
	Tillamook	20	17	17	8	25	56%	50%	36%	56%
	Nestucca	20	14	14	7	23	100%	70%	42%	119%
	NC Depend.	7	8	7	4	9	71%	80%	12%	104%
	Total	80	63	66	30	92	28%	29%	22%	46%
Mid-Coast	Salmon	9	6	10	5	17	28%	77%	23%	126%
	Siletz	20	14	19	12	26	73%	43%	33%	56%
	Yaquina	20	18	17	10	22	22%	42%	33%	55%
	Beaver	3	4	4	3	5	33%	68%	24%	130%
	Alsea	20	18	18	11	24	59%	34%	26%	55%
	Siuslaw	20	15	17	12	23	33%	40%	28%	59%
	MC Depend.	8	2	8	5	11	53%	81%	43%	132%
	Total	100	77	92	65	114	28%	20%	16%	27%
Lakes	Siltcoos	0	0	0	0	0	n.a.	n.a.	n.a.	n.a.
	Tahkenitch	0	0	0	0	0	n.a.	n.a.	n.a.	n.a.
	Tenmile	0	0	0	0	0	n.a.	n.a.	n.a.	n.a.
	Total	0	0	0	0	0	n.a.	n.a.	n.a.	n.a.
Umpqua	L. Umpqua	20	17	16	11	20	36%	48%	24%	78%
	M. Umpqua	20	13	13	6	17	51%	67%	50%	85%
	N. Umpqua	3	1	1	0	3	n.a.	n.a.	n.a.	n.a.
	S. Umpqua	20	15	15	9	20	64%	72%	37%	107%
	Total	63	46	46	30	55	33%	38%	22%	62%
Mid-South Coast	Coos	20	17	18	11	22	37%	50%	29%	69%
	Coquille	20	17	18	11	24	51%	44%	33%	57%
	Floras	17	5	10	1	22	53%	48%	17%	72%
	Sixes	8	6	9	3	16	176%	74%	40%	115%
	MS Depend	3	0	2	0	6	n.a.	179%	163%	195%
	Total	68	45	56	34	79	30%	32%	26%	37%
ESU Total		311	231	259	191	322	15%	16%	13%	18%

n.a. = Not available (no surveys were selected in the population, less than 2 surveys stayed in rotation, or the abundance estimate was 0).

Table 5. Oregon Coast ESU adult Coho Salmon occupancy (total & wild) by population, stratum, and ESU for the 2023 run year and previous 9-year average (2014–22). Occupancy = a peak of 4 or more adult Coho Salmon per mile. Wild Occupied = occupied sites with at least one wild Coho Salmon. n.a. = not available.

ESU, Stratum, and Population	2023 No. sites surveyed	9 yr. avg. No. sites surveyed	Total Coho Salmon		Wild Coho Salmon	
			2023 % Occupied	9 yr. avg. % Occupied	2023 % Occupied	9 yr. avg. % Occupied
Oregon Coast ESU	231	259	74.5%	67.3%	73.6%	65.8%
North Coast Stratum	63	66	76.2%	72.2%	76.2%	70.4%
Necanicum River	11	13	90.9%	79.1%	90.9%	76.5%
Nehalem River	13	16	84.6%	75.6%	84.6%	74.0%
Tillamook Bay	17	17	76.5%	69.3%	76.5%	67.6%
Nestucca River	14	14	71.4%	74.9%	71.4%	72.5%
NC Dependents	8	7	50.0%	56.9%	50.0%	55.0%
Mid-Coast Stratum	77	92	87.0%	76.4%	87.0%	75.0%
Salmon River	6	10	66.7%	50.8%	66.7%	46.6%
Siletz River	14	19	100.0%	86.6%	100.0%	86.6%
Yaquina River	18	17	94.4%	85.0%	94.4%	84.4%
Beaver Creek	4	4	100.0%	96.3%	100.0%	92.6%
Alsea River	18	18	88.9%	85.0%	88.9%	85.0%
Siuslaw River	15	17	80.0%	73.9%	80.0%	72.6%
MC Dependents	2	8	0.0%	35.2%	0.0%	28.6%
Lakes Stratum	0	0	n.a.	n.a.	n.a.	n.a.
Siltcoos Lake	0	0	n.a.	n.a.	n.a.	n.a.
Tahkenitch Lake	0	0	n.a.	n.a.	n.a.	n.a.
Tenmile Lake	0	0	n.a.	n.a.	n.a.	n.a.
Umpqua Stratum	46	46	56.5%	51.4%	52.2%	49.6%
Lower Umpqua River	17	16	70.6%	75.6%	58.8%	72.8%
Mid. Umpqua River	13	13	69.2%	45.2%	69.2%	44.3%
North Umpqua River	1	1	0.0%	n.a.	0.0%	n.a.
South Umpqua River	15	15	33.3%	32.9%	33.3%	31.1%
Mid-South Stratum	45	56	68.9%	61.2%	68.9%	59.5%
Coos River	17	18	94.1%	74.8%	94.1%	73.7%
Coquille River	17	18	64.7%	71.0%	64.7%	69.4%
Floras Creek	5	10	80.0%	71.4%	80.0%	68.5%
Sixes River	6	9	0.0%	28.0%	0.0%	22.5%
MSC Dependents	0	2	n.a.	5.6%	n.a.	5.6%

Table 6. Oregon Coast ESU estimated abundance of adult Coho Salmon spawning naturally by ESU, stratum, and population for the 2023 run year compared to the previous 33-year average.

Geographic scale ESU/Stratum/Population	Coho salmon origin	Spawning year			
		2023	1990 to 2022		
			Avg.	Min.	Max.
Oregon Coast ESU	Wild	153,006	129,113	21,139	359,692
	Hatchery	742	7,603	386	26,128
	% Hat.	0.5%	8.7%	0.4%	31.4%
North Coast Stratum	Wild	35,137	22,252	1,524	67,370
	Hatchery	329	1,703	0	15,563
	% Hat.	0.9%	15.3%	0.0%	79.0%
Necanicum River	Wild	1,637	1,318	97	5,727
	Hatchery	149	104	0	501
	% Hat.	8.3%	13.5%	0.0%	40.1%
Nehalem River	Wild	14,388	11,897	527	32,517
	Hatchery	0	1,284	0	14,014
	% Hat.	0.0%	16.9%	0.0%	87.7%
Tillamook Bay	Wild	13,325	5,058	80	20,090
	Hatchery	180	255	0	1,498
	% Hat.	1.3%	13.8%	0.0%	68.9%
Nestucca River	Wild	3,894	3,283	160	16,698
	Hatchery	0	50	0	274
	% Hat.	0.0%	4.8%	0.0%	15.3%
North Coast Dependents	Wild	1,893	696	0	4,607
	Hatchery	0	16	0	111
	% Hat.	0.0%	0.9%	0.0%	6.3%
Mid-Coast Stratum	Wild	42,562	37,815	2,444	121,963
	Hatchery	350	1,694	0	9,633
	% Hat.	0.8%	11.0%	0.0%	50.1%
Salmon River	Wild	1,249	602	5	3,680
	Hatchery	0	506	0	2,621
	% Hat.	0.0%	48.2%	0.0%	97.6%
Siletz River	Wild	5,410	6,787	207	33,094
	Hatchery	0	221	0	962
	% Hat.	0.0%	13.3%	0.0%	58.4%
Yaquina River	Wild	5,833	6,300	317	25,582
	Hatchery	0	147	0	1,526
	% Hat.	0.0%	5.9%	0.0%	25.0%
Beaver Creek	Wild	943	1,738	90	6,564
	Hatchery	0	43	0	405
	% Hat.	0.0%	3.1%	0.0%	23.8%
Alsea River	Wild	7,653	7,227	108	28,337
	Hatchery	349	267	0	2,214
	% Hat.	4.4%	12.9%	0.0%	93.8%
Siuslaw River	Wild	21,391	13,698	501	55,445
	Hatchery	0	494	0	4,136
	% Hat.	0.0%	8.5%	0.0%	37.6%
Mid Coast Dependents	Wild	83	1,462	51	8,179
	Hatchery	1	27	0	118
	% Hat.	1.2%	1.6%	0.0%	5.9%

Table 6. Continued

Geographic scale ESU/Stratum/Population	Coho salmon origin	Spawning year			
		2023	1990 to 2022		
			Avg.	Min.	Max.
Lakes Stratum	Wild	12,396	13,425	1,302	38,744
	Hatchery	7	46	0	251
	% Hat.	0.1%	0.4%	0.0%	2.2%
Siltcoos Lake	Wild	2,006	3,716	385	7,998
	Hatchery	0	22	0	124
	% Hat.	0.0%	0.9%	0.0%	8.7%
Tahkenitch Lake	Wild	1,357	2,618	269	10,681
	Hatchery	7	11	0	107
	% Hat.	0.5%	0.4%	0.0%	3.1%
Tenmile Lake	Wild	9,033	7,091	318	20,385
	Hatchery	0	13	0	123
	% Hat.	0.0%	0.2%	0.0%	3.4%
Umpqua Stratum	Wild	30,796	26,969	3,334	94,655
	Hatchery	56	3,780	41	17,758
	% Hat.	0.2%	15.1%	0.4%	36.0%
Lower Umpqua River	Wild	5,263	10,143	1,257	36,942
	Hatchery	0	222	0	1,484
	% Hat.	0.0%	2.7%	0.0%	15.7%
Middle Umpqua River	Wild	9,652	6,038	563	19,962
	Hatchery	0	185	0	1,259
	% Hat.	0.0%	3.6%	0.0%	20.6%
North Umpqua River	Wild	7,071	2,664	355	9,397
	Hatchery	56	2,650	41	14,094
	% Hat.	0.8%	41.5%	1.2%	84.3%
South Umpqua River	Wild	8,810	8,124	0	49,958
	Hatchery	0	722	0	7,040
	% Hat.	0.0%	12.3%	0.0%	57.2%
Mid-South Coast Stratum	Wild	32,115	28,652	4,890	82,077
	Hatchery	0	381	0	2,766
	% Hat.	0.0%	1.8%	0.0%	23.8%
Coos River	Wild	24,020	13,369	1,112	38,880
	Hatchery	0	173	0	1,387
	% Hat.	0.0%	1.9%	0.0%	36.4%
Coquille River	Wild	7,707	13,009	2,033	55,667
	Hatchery	0	146	0	1,832
	% Hat.	0.0%	1.5%	0.0%	15.4%
Floras Creek	Wild	369	2,357	340	11,329
	Hatchery	0	53	0	400
	% Hat.	0.0%	3.2%	0.0%	22.8%
Sixes River	Wild	19	173	34	567
	Hatchery	0	14	0	182
	% Hat.	0.0%	7.0%	0.0%	65.7%
Mid-South Coast Dependents	Wild	0	76	0	484
	Hatchery	0	1	0	9
	% Hat.	0.0%	0.8%	0.0%	4.6%

Table 7. Comparison of two independent coho abundance estimates at each of two life-cycle monitoring sites in the Oregon Coast ESU. An estimate based on AUC protocol compared to a Mark–Recapture estimate (Mill Cr., Siletz R) or a Dam Count (Mill Cr., Yaquina R).

Spawning Year	Mill Creek (Siletz R.)			Mill Creek (Yaquina R.)		
	M-R Est.	AUC Est.	AUC/M-R	Dam Count	AUC Est.	AUC/Dam
2014	1,844	1,642	89%	1,471	1,677	114%
2015	316	196	62%	275	142	52%
2016	451	440	98%	760	607	80%
2017	518	471	91%	405	211	52%
2018	363	276	76%	382	298	78%
2019	674	611	91%	473	291	62%
2020	656	834	127%	<i>No comparison in 2020</i>		
2021	2,321	2,102	91%	1,223	993	81%
2022	1,175	1,038	88%	590	521	88%
2023	<i>No comparison in 2023</i>			886	600	68%
Mean	924	846	90%	685	593	75%

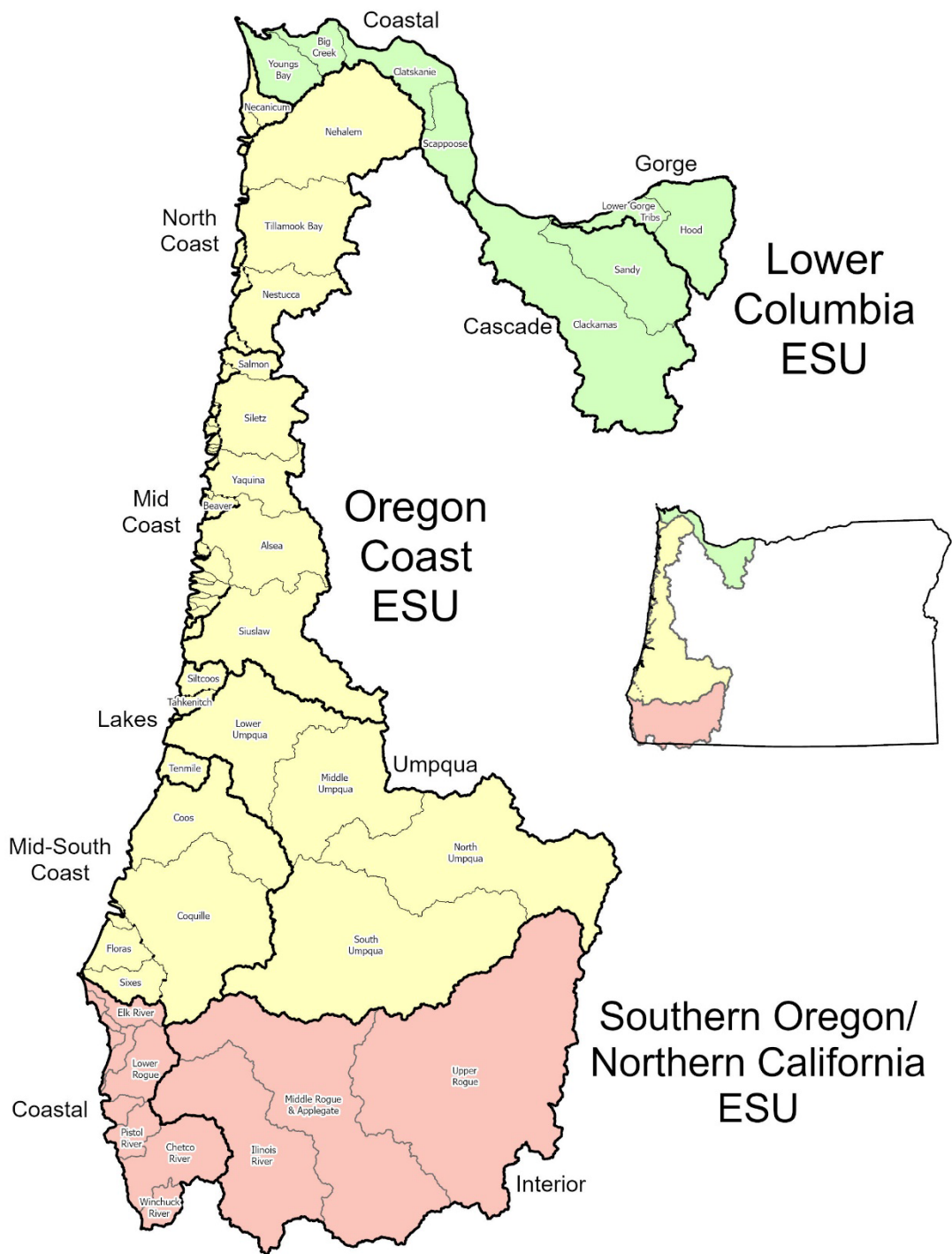
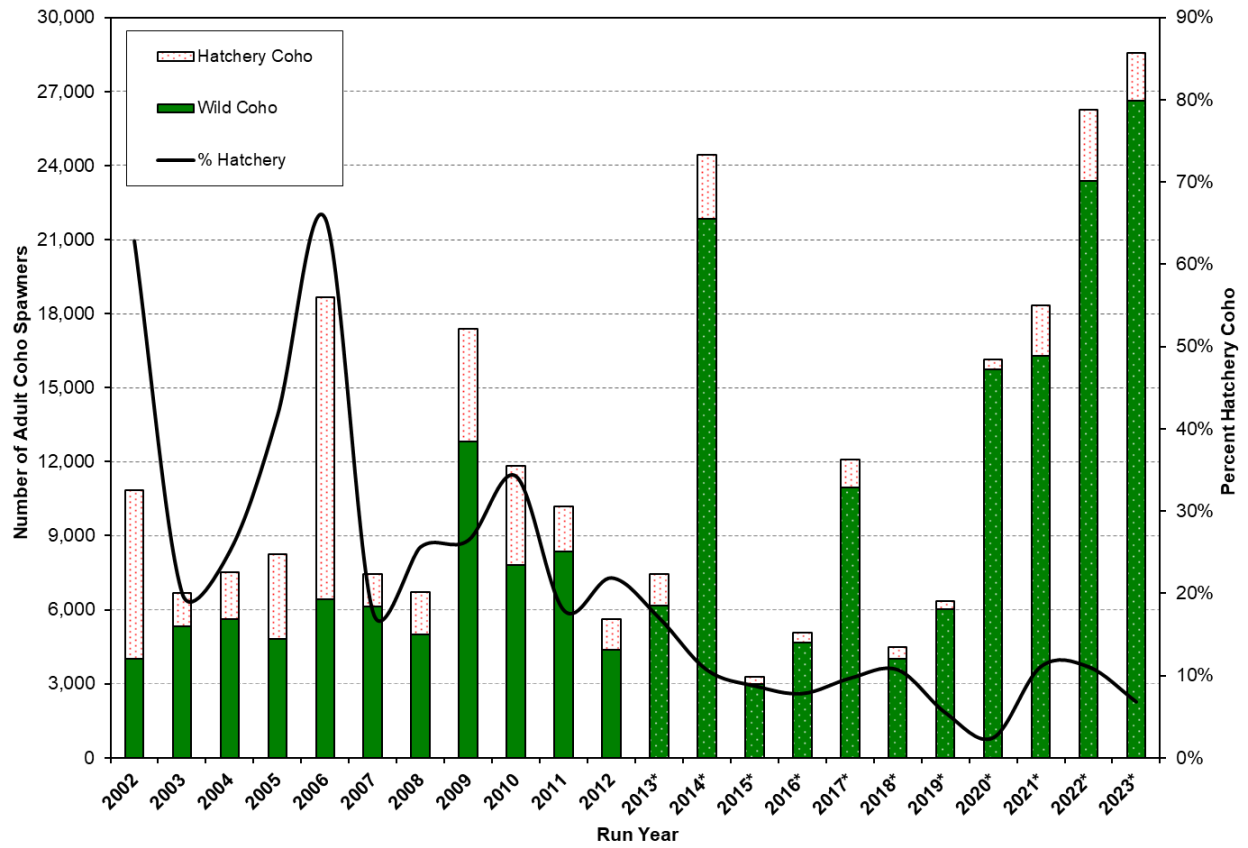


Figure 1. Coho Salmon monitoring study area showing populations, strata, and evolutionarily significant units.



* Estimates for 2013 to present do not include Big Creek and Youngs Bay populations and are therefore incomplete. These populations combined account for an average of 12% of the total estimate for the ESU (about 7% of the wild, and 27% of the hatchery components). Note: The Hood River and Lower Gorge populations were not sampled in 2017 (wildfires) and 2020 (budgets).

Figure 2. Lower Columbia River ESU estimated abundance of adult Coho Salmon spawning naturally by rearing origin for the 2002 through 2023 run years.

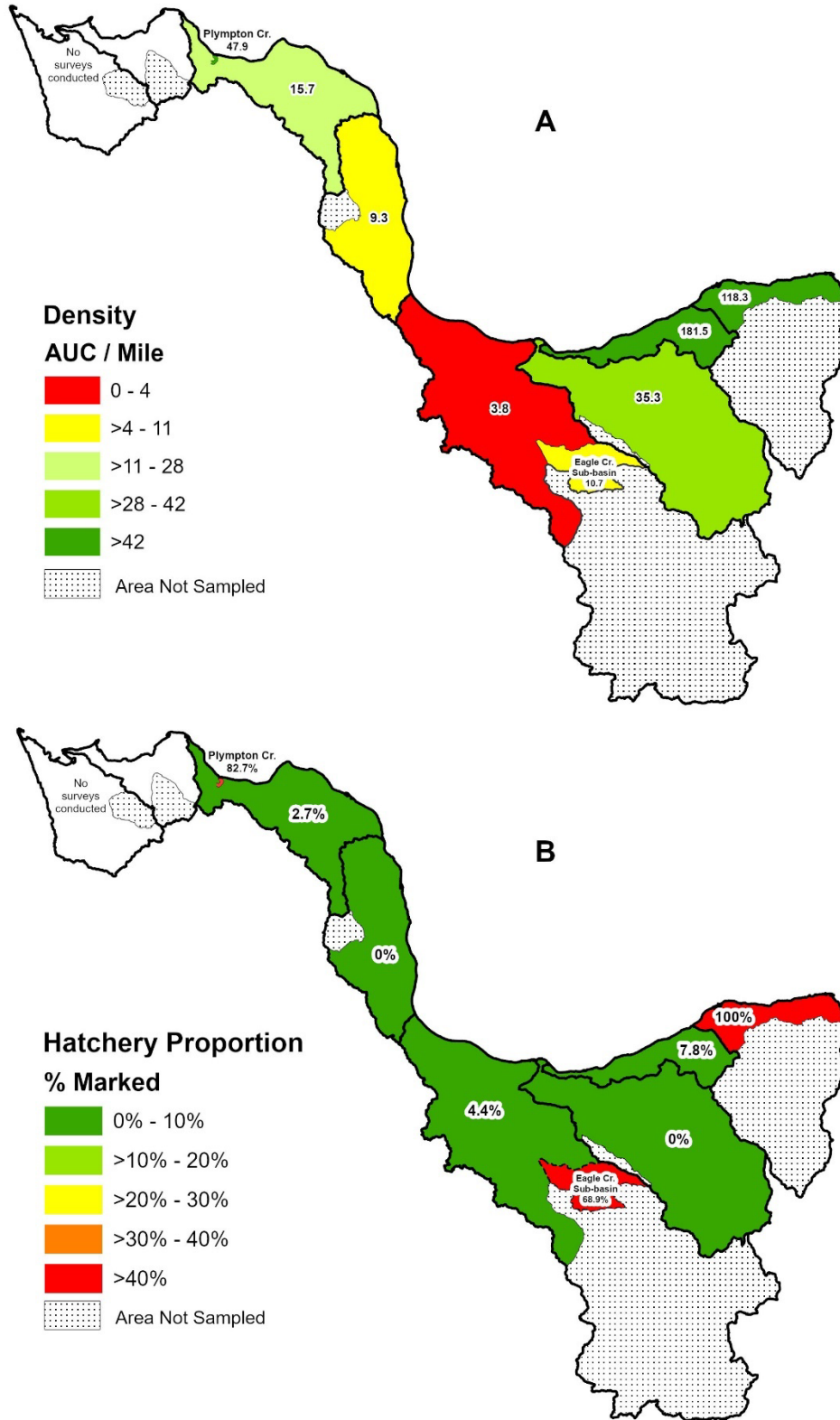


Figure 3. A) Coho salmon density (AUC/mile) in GRTS surveys by lower Columbia River population, 2023. B) Percentage of marked adult coho salmon in GRTS surveys by lower Columbia River TRT population, 2023.

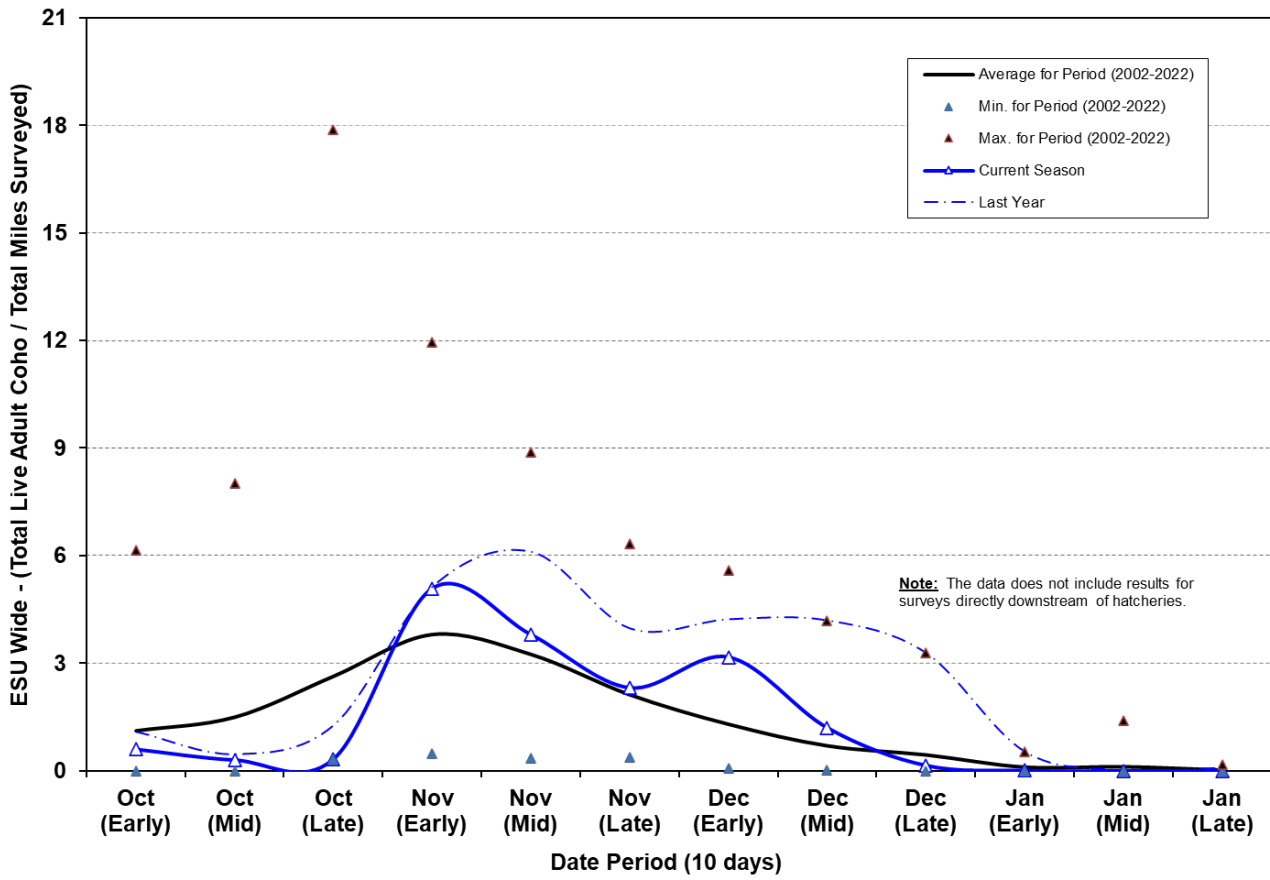


Figure 4. Spawn timing of live adult Coho Salmon in 2023 on GRTS spawning ground surveys in the Lower Columbia River ESU.

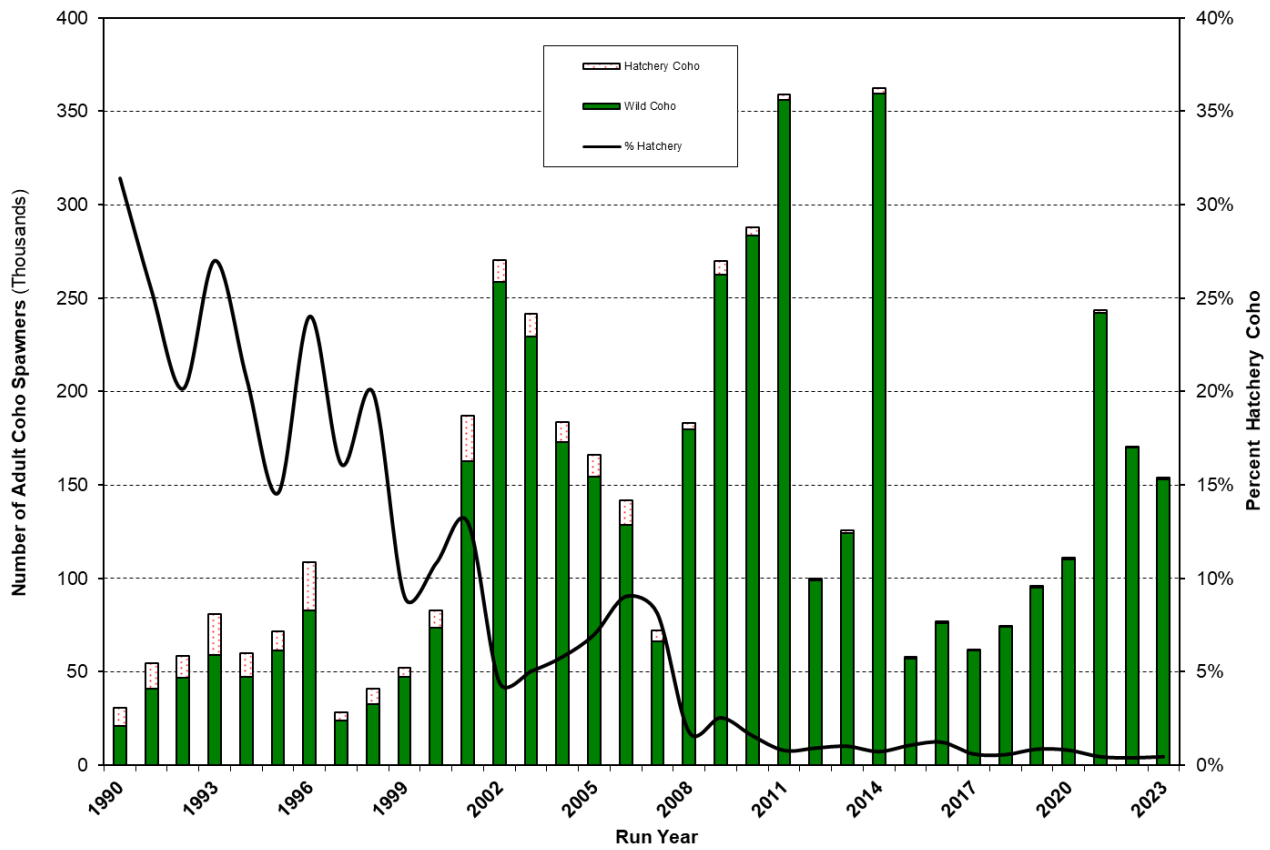


Figure 5. Oregon Coast ESU estimated abundance of adult Coho Salmon spawning naturally by rearing origin for the 1990 through 2023 run years.

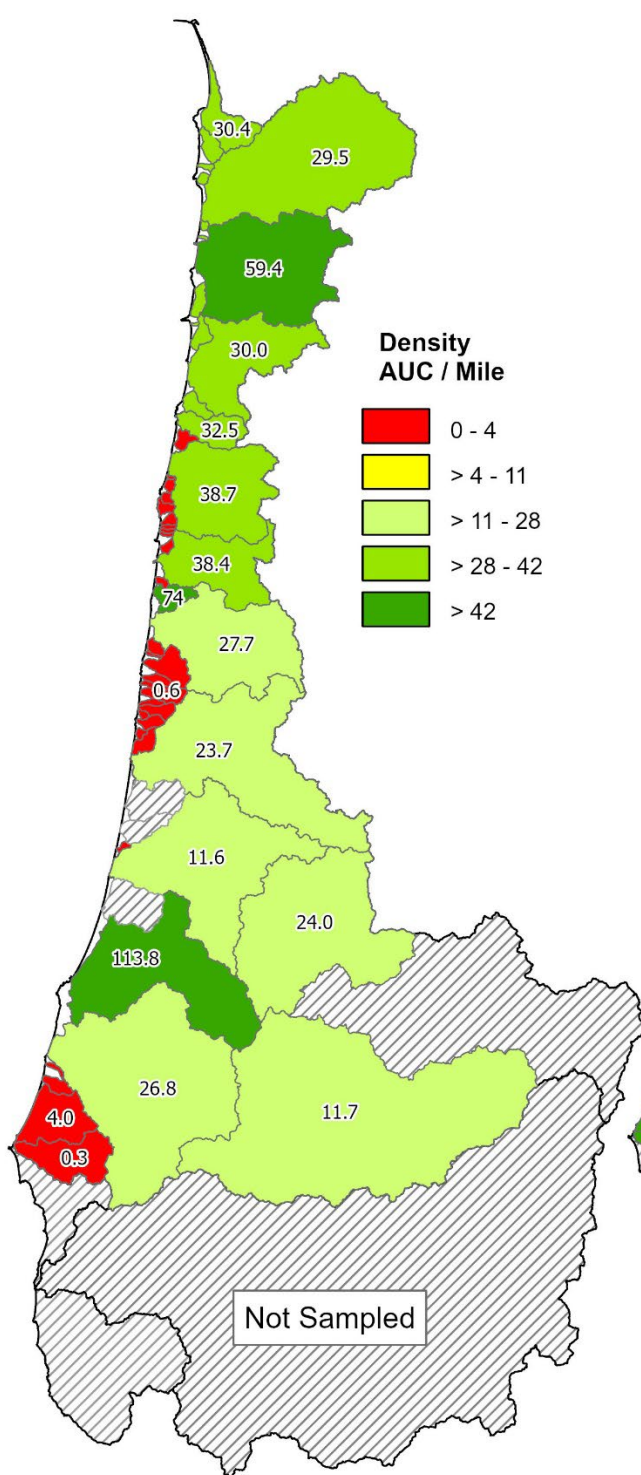


Figure 6. Coho salmon density (AUC/mile) in GRTS surveys by population in the Oregon Coast Coho ESU, 2023.

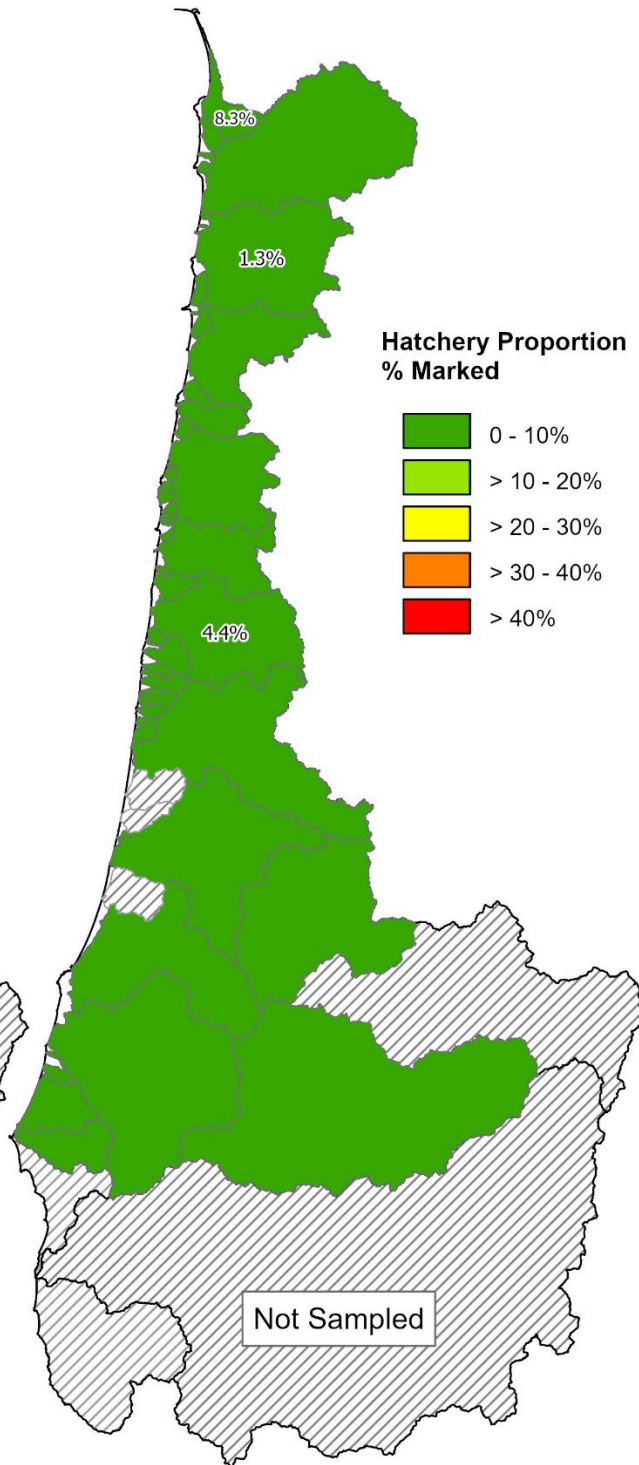


Figure 7. Percentage of marked adult coho salmon in GRTS surveys by strata in the Oregon Coast Coho ESU, 2023 (0% unless labeled otherwise).

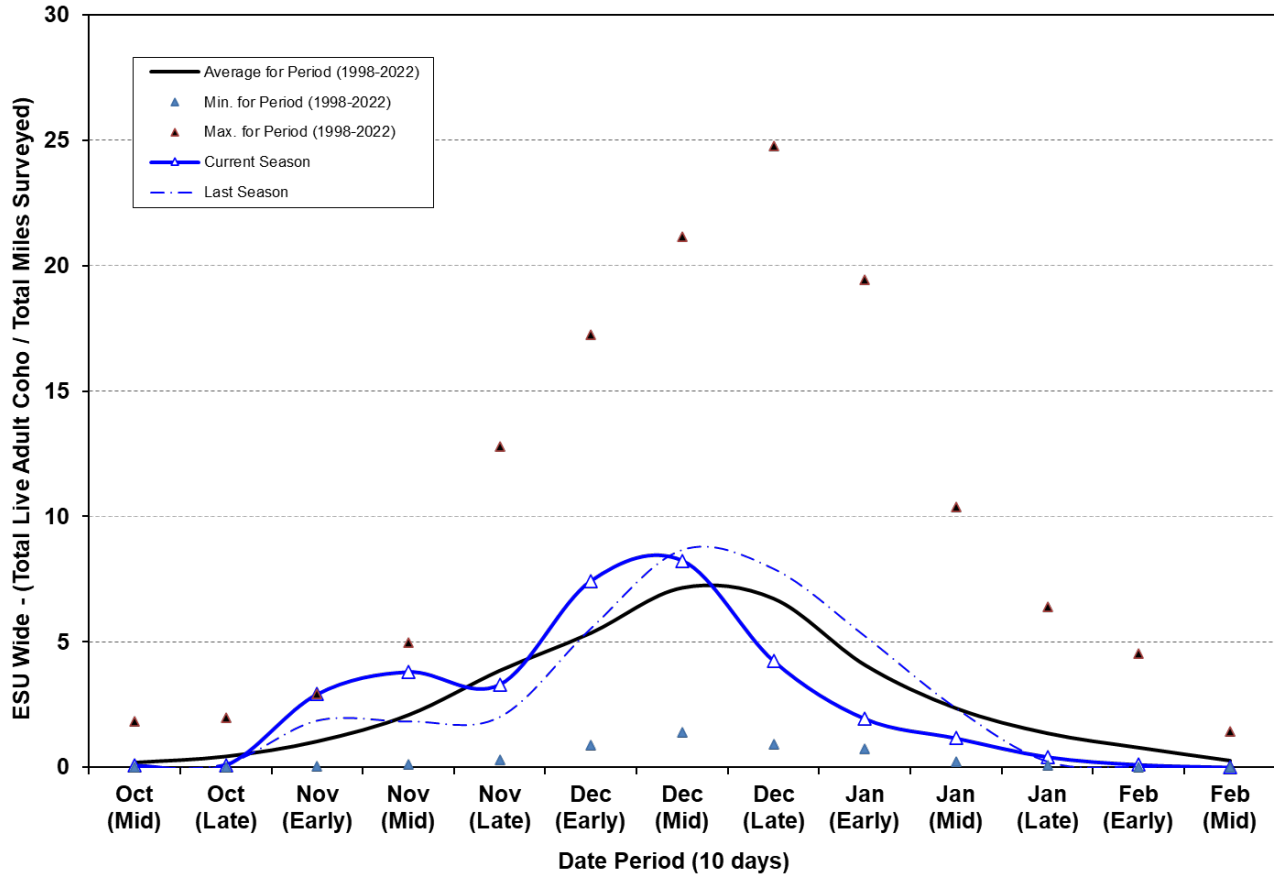


Figure 8. Spawn timing of live adult Coho Salmon in 2023 on GRTS spawning ground surveys in the Oregon Coast ESU.

APPENDIX A (LCR ESU)

Table A-1. Results of randomly selected spawning ground surveys for Coho Salmon in the Oregon portion of the LCR ESU, run year 2023. Estimates derived using GRTS protocol. Estimates of wild spawners derived through application of fin-mark observations. Missing values for populations indicate inadequate samples for determining total and/or wild abundance.

ESU, Stratum, and TRT Population	Survey effort number of		Adult Coho Salmon spawner abundance			
			Total		Wild	
	Surveys	Miles	Estimate	95% CI	Estimate	95% CI
Lower Columbia River ESU	104	92.9	8,899	3,744	6,966	3,212
Coast Stratum	46	40.4	1,615	380	1,549	374
Youngs Bay	0					
Big Creek	0					
Clatskanie River (ex. Plympton)	26	24.5	906	294	881	286
Plympton Cr. (Clatskanie R.)	1	1.0	49	0	8	0
Scappoose River	19	14.9	660	242	660	242
Cascade Stratum	53	50.6	5,209	3,140	4,669	3,128
Clackamas River (ex. Eagle Cr.)	20	16.7	504	158	482	151
Eagle Creek (Clackamas R.)	10	11.1	751	277	233	86
Sandy River	23	22.8	3,953	3,123	3,953	3,123
Gorge Stratum	5	1.9	2,076	2,003	748	625
Lower Gorge	2	0.8	811	678	748	625
Hood River	3	1.1	1,265	1,885	0	0

Table A-2. The number of unmarked adult Coho Salmon passed upstream of counting stations into areas without GRTS spawning surveys. Oregon portion of the LCR ESU, run year 2023.

ESU, Stratum, and TRT Population	Counting station	Spawning year			
		2002 to 2022			
		2023	Avg.	Min.	Max.
Lower Columbia River ESU					
Coast Stratum					
Youngs Bay	Klaskanine Hatchery	24	22	2	68
Big Creek	Big Creek Hatchery	498	270	46	606
Scappoose River	Bonnie Falls Trap	n.a. ^a	47	4	136
Cascade Stratum					
Clackamas River	River Mill Dam	19,201	3,901	835	13,136
Sandy River	Sandy Hatchery ^b	475	275	36	832
	Marmot Dam	n.a.	809	310	1,173
Gorge Stratum					
Hood River	Powerdale Dam	n.a.	52	27	126

a = Not Applicable. Trap count discontinued after 2018 season, and area above trap included in GRTS sampling starting in 2020.

b = Sandy Hatchery count through 2009 is number released above Marmot Dam, which was removed in 2006. Beginning in 2010, Sandy Hatchery switched the release site for these fish to above the hatchery weir on Cedar Creek.

n.a. = Not Applicable. Marmot dam was removed in 2006 and Powerdale Dam was removed in 2010, so there are no longer any dam counts.

Table A-3. Annual abundance estimates of naturally spawning wild adult Coho Salmon in the Oregon portion of the LCR ESU, run years 2002 through 2023. n.a. = not available.

Return Year	Youngs Bay	Big Creek	Clatskanie*	Scappoose	Clackamas*	Sandy	Lower Gorge	Hood River
2002	411	98	167	500	1,985	382	338	147
2003	113	435	563	336	2,495	1,348	n.a.	41
2004	149	111	398	755	2,733	1,213	n.a.	126
2005	79	219	494	348	1,301	856	263	1,262
2006	74	225	421	719	3,464	923	226	373
2007	25	212	927	375	3,438	687	126	170
2008	82	360	995	294	1,800	1,277	223	69
2009	28	792	1,195	778	8,642	1,493	468	65
2010	68	279	1,686	1,960	4,009	901	920	223
2011	161	160	1,546	297	2,253	3,494	216	232
2012	129	409	619	210	1,663	1,165	96	169
2013	n.a.	n.a.	611	979	4,012	667	151	561
2014	n.a.	n.a.	3,246	1,587	10,672	5,942	362	42
2015	n.a.	n.a.	240	487	1,784	443	30	4
2016	n.a.	n.a.	464	1,200	1,628	939	395	57
2017	n.a.	n.a.	566	387	7,598	2,384	n.a.	n.a.
2018	n.a.	n.a.	25	178	3,159	537	16	107
2019	n.a.	n.a.	146	384	4,044	1,052	184	193
2020	n.a.	n.a.	1,233	n.a.	n.a.	n.a.	n.a.	n.a.
2021	n.a.	n.a.	476	921	10,572	3,819	n.a.	510
2022	n.a.	n.a.	1,139	508	13,991	7,152	523	60
2023	n.a.	n.a.	890	660	19,916	4,428	748	0

* = Stratified abundance estimation. Plympton Creek is estimated separately from the rest of the Clatskanie population and Eagle Creek is estimated separately from the rest of the Clackamas population.

APPENDIX B (OC ESU)

Table B-1. Results of randomly selected spawning ground surveys for Coho Salmon in the OC ESU, run year 2023. Estimates derived using GRTS protocol. Estimates of wild spawners derived through application of fin-mark observations. Missing values for populations indicate inadequate samples for determining total and/or wild abundance.

ESU, Stratum, and TRT Population	Survey effort number of		Adult Coho Salmon spawner abundance			
	Surveys	Miles	Total		Wild	
			Estimate	95% CI	Estimate	95% CI
Oregon Coast ESU	231	175.6	134,078	19,913	133,297	19,858
North Coast Stratum	63	47.5	35,467	10,039	35,138	9,959
Necanicum River	11	7.4	1,786	677	1,637	621
Nehalem River	13	10.1	14,388	5,027	14,388	5,027
Tillamook Bay	17	13.6	13,505	7,611	13,325	7,510
Nestucca River	14	11.6	3,894	3,912	3,894	3,912
NC Dependents	8	4.8	1,893	1,353	1,893	1,353
Mid-Coast Stratum	77	56.7	42,771	11,841	42,338	11,815
Salmon River	6	5.2	1,249	910	1,249	910
Siletz River	14	10.7	5,410	1,217	5,410	1,217
Yaquina River	18	12.1	5,833	1,940	5,833	1,940
Beaver Creek	4	2.2	943	552	943	552
Alsea River	18	13.8	7,862	2,601	7,513	2,485
Siuslaw River	15	10.6	21,391	11,272	21,391	11,272
MC Dependents	2	2.2	84	164		
Umpqua Stratum	46	37.7	23,725	7,730	23,725	7,730
Lower Umpqua River	17	12.9	5,263	1,883	5,263	1,883
Middle Umpqua River	13	11.1	9,652	4,893	9,652	4,893
North Umpqua River	1	0.4				
South Umpqua River	15	13.3	8,810	5,681	8,810	5,681
Mid-South Coast Stratum	61	50.4	27,433	7,661	27,433	7,661
Coos River	16	13.9	7,370	2,975	7,370	2,975
Coquille River	14	9.5	19,078	7,043	19,078	7,043
Floras Creek	14	10.8	871	477	871	477
Sixes River	16	16.0	113	97	113	97
MSC Dependents	1	0.2	0			

Table B-2. Coho Salmon spawners in the Oregon Coastal Lakes populations based on calibrated standard surveys, 2023.

ESU, Stratum, & TRT Population	Survey goal	Survey effort number of		Adult Coho Salmon spawner abundance			
				Total		Wild	
		Surveys	Miles	Estimate	95% CI	Estimate	95% CI
Standard Surveys							
Lakes Strata	14	8	8.0	12,403	--	12,396	--
Siltcoos	5	2	2.5	2,006	--	2,006	--
Tahkenitch	2	2	1.6	1,364	--	1,357	--
Tenmile	7	4	3.9	9,033	--	9,033	--

Table B-3. Coho passage above the Alsea Hatchery into an area without GRTS surveys (Alsea Population) and estimates of adult Coho Salmon run size in the North Umpqua Population derived through adjustment of Winchester Dam count. Dam count adjusted for adult Coho Salmon retained by hatchery operations and harvest above Winchester Dam, 2023, compared to the previous 9 years.

Data component	Coho salmon origin	Spawning year			
		2023	2014 to 2022		
			Avg.	Min.	Max.
Alsea Population Passed above Alsea Hatchery	Wild	140	133	9	475
North Umpqua Population	Wild	7,071	2,830	1,148	4,795
	Hatchery	56	176	41	404
	% Hat.	0.8%	5.9%	1.2%	10.9%
GRTS Estimate below Winchester Dam ¹	Total	197	41	0	298
	Wild	193	41	0	298
	Hatchery	4	0	0	0
Winchester Dam ²	Total	6,938	2,987	1,252	5,149
	Wild	6,884	2,790	1,148	4,798
	Hatchery	54	197	47	407
Freshwater Catch ³ Above Winchester Dam	Total	8	21	3	60
	Wild	6	1	0	5
	Hatchery	2	20	3	60
Rock Creek Hatchery ⁴	Total	0	1	0	10
	Wild	0	0	0	0
	Hatchery	0	1	0	10

1 = Estimate of adult Coho Salmon observed in GRTS surveys below Winchester Dam (i.e., Sutherlin Creek and tributaries).

2 = Counts of adult Coho Salmon by mark type (marked = hatchery, unmarked = wild) at Winchester Dam on the North Umpqua River.

3 = Estimated freshwater harvest of Coho Salmon in the North Umpqua basin above Winchester Dam based on Angler Harvest Cards (see: <http://www.dfw.state.or.us/resources/fishing/sportcatch.asp>). Selective harvest of mark Coho Salmon began in 2004.

4 = Number of adult Coho Salmon collected from the North Umpqua population (at Rock Creek and at Winchester Dam) and retained at Rock Creek Hatchery. These numbers do not include Coho Salmon collected and released alive back into the wild.

Table B-4. Annual abundance estimates of naturally spawning wild adult Coho Salmon in the Oregon Coast ESU, run years 1990 through 2023 n.a. = not available. *Numbers in italics are partial estimates of spawners in dependent populations.*

Stratum and Population	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
North Coast											
Necanicum River	126	752	133	512	269	181	416	97	575	351	359
Nehalem River	1,158	6,837	1,392	3,049	2,844	1,700	527	1,187	1,206	3,555	14,462
Tillamook Bay	80	1,577	176	571	1,105	341	733	437	358	1,831	2,178
Nestucca River	160	618	604	340	266	1,537	440	230	202	2,357	1,219
NC Dependents	0	444	24	41	77	108	275	61	0	47	0
Mid-Coast											
Salmon River	19	5	11	13	91	105	82	16	86	14	179
Siletz River	228	410	2,386	207	621	314	395	298	316	1,209	3,387
Yaquina River	318	317	528	458	2,040	4,723	4,578	419	510	2,563	637
Beaver Creek	90	484	618	275	675	308	1,296	497	401	1,511	1,464
Alsea River	775	1,011	6,273	694	828	441	1,060	601	108	1,341	3,363
Siuslaw River	2,269	2,808	3,554	4,600	3,159	6,161	7,234	501	1,020	2,980	6,532
MC Dependents	487	51	1,037	467	317	348	1,364	112	173	150	91
Umpqua											
Lower Umpqua River	1,678	3,123	1,797	7,877	2,762	10,854	7,985	1,257	4,552	2,623	5,781
Middle Umpqua River	1,222	4,546	5,275	2,947	2,162	3,250	5,086	563	1,257	1,748	4,555
North Umpqua River	355	1,301	1,579	906	899	1,293	1,069	577	765	1,194	1,677
South Umpqua River	2,934	2,233	435	3,723	1,081	4,715	7,040	937	3,177	3,011	2,581
Lakes											
Siltcoos	1,578	2,868	385	3,569	1,302	4,415	4,707	2,653	3,122	2,756	3,835
Tahkenitch	1,085	1,215	317	954	1,056	1,577	1,627	1,842	2,817	3,664	634
Tenmile	1,687	3,033	1,271	5,544	3,354	5,092	7,092	4,092	5,169	6,123	8,278
Mid-South Coast											
Coos River	2,243	2,426	16,722	14,932	14,500	10,302	12,128	1,112	2,985	4,818	4,704
Coquille River	2,589	4,782	2,033	7,291	5,119	2,034	15,814	5,720	2,412	2,667	6,253
Floras Creek	n.a.	n.a.	n.a.	n.a.	2,653	1,351	1,519	482	879	670	1,477
Sixes River	58	35	92	253	238	77	194	143	558	56	136
MSC Dependents	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Table B-4. Continued.

Stratum and Population	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
North Coast											
Necanicum River	4,832	2,047	2,377	2,198	1,218	750	431	1,055	3,827	4,445	2,120
Nehalem River	21,928	17,164	32,517	18,736	10,451	11,614	14,033	17,205	21,753	32,215	15,322
Tillamook Bay	1,944	13,334	13,008	2,532	1,995	8,774	2,295	4,828	16,251	14,890	19,250
Nestucca River	4,164	16,698	10,194	4,695	686	1,876	394	1,844	4,252	1,947	7,857
NC Dependents	71	16	0	661	2,116	1,121	376	639	2,052	1,473	1,341
Mid-Coast											
Salmon River	225	543	42	1,642	79	513	59	652	753	1,382	3,636
Siletz River	1,595	2,129	8,038	8,179	14,567	5,205	2,197	20,634	24,070	6,283	33,094
Yaquina River	3,589	23,800	16,484	5,539	3,441	4,247	3,158	10,913	11,182	8,589	19,074
Beaver Creek	1,832	3,217	5,552	4,569	2,264	1,950	611	1,218	3,575	2,072	2,389
Alsea River	3,228	9,073	10,281	5,233	13,907	1,972	2,146	13,320	14,638	9,688	28,337
Siuslaw River	10,606	55,445	29,003	8,729	16,907	5,869	3,552	17,491	30,607	25,983	28,082
MC Dependents	816	5,308	1,852	8,179	246	1,468	546	3,910	1,610	2,548	4,487
Umpqua											
Lower Umpqua River	11,639	18,881	16,494	8,989	18,591	7,994	4,237	9,023	19,245	17,516	18,715
Middle Umpqua River	8,940	10,738	11,090	6,375	7,608	4,852	1,587	4,472	15,075	18,123	19,962
North Umpqua River	2,634	3,368	2,862	3,559	1,969	3,000	1,410	3,438	7,720	9,397	6,020
South Umpqua River	11,871	10,517	4,337	10,997	14,364	2,246	4,549	20,935	15,944	24,983	49,958
Lakes											
Siltcoos	5,104	4,636	6,628	7,998	4,364	5,452	1,447	3,873	5,197	7,678	6,354
Tahkenitch	3,510	3,480	3,188	3,496	1,897	3,611	3,551	2,604	2,977	10,681	6,644
Tenmile	10,990	13,861	6,260	7,148	8,464	15,064	3,957	17,131	9,175	20,385	7,284
Mid-South Coast											
Coos River	33,595	33,120	25,761	23,337	17,048	11,266	1,329	14,881	26,979	27,658	10,999
Coquille River	13,833	7,676	22,403	22,138	11,806	28,577	13,968	8,791	22,286	23,564	55,667
Floras Creek	5,664	3,272	952	7,446	506	1,104	340	786	3,203	11,329	9,217
Sixes River	95	95	86	403	105	294	97	43	176	92	334
MSC Dependents	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	0	188	484	100

Table B-4. Continued.

Stratum and Population	2012	2013	2014	2015	2016	2017	2018	2019	2020 ^a	2021	2022
North Coast											
Necanicum River	902	798	5,727	847	936	529	393	698	n.a.	n.a.	n.a.
Nehalem River	2,963	4,539	30,577	3,079	7,549	5,486	4,190	12,383	n.a.	n.a.	n.a.
Tillamook Bay	1,686	4,402	20,090	1,345	7,102	2,927	2,035	3,961	n.a.	n.a.	n.a.
Nestucca River	1,751	946	6,369	1,029	2,412	4,495	1,072	4,602	n.a.	n.a.	n.a.
NC Dependents	218	271	4,607	440	699	206	262	616	n.a.	n.a.	n.a.
Mid-Coast											
Salmon River	297	1,165	3,680	332	1,054	450	103	215	n.a.	571	1,324
Siletz River	4,495	7,660	19,496	2,216	3,015	5,202	4,064	4,509	n.a.	15,428	16,466
Yaquina River	6,268	3,553	25,582	2,400	3,730	2,491	4,672	3,452	n.a.	16,721	6,484
Beaver Creek	1,878	2,015	6,564	332	1,709	1,553	494	814	n.a.	2,483	2,058
Alsea River	8,470	9,283	25,855	6,185	7,375	4,377	5,112	4,915	n.a.	13,633	19,141
Siuslaw River	11,946	14,118	38,896	10,352	9,141	7,129	6,635	5,881	n.a.	38,031	24,892
MC Dependents	492	1,929	1,890	856	464	1,646	958	289	n.a.	1,747	1,568
Umpqua											
Lower Umpqua River	3,731	7,792	36,942	3,725	4,422	10,848	14,080	9,152	n.a.	23,714	6,448
Middle Umpqua River	2,447	4,272	13,939	2,245	1,159	1,788	3,888	3,104	n.a.	6,354	1,665
North Umpqua River	3,134	2,774	3,979	3,012	1,148	1,772	2,481	3,302	3,003	4,795	1,519
South Umpqua River	11,636	12,178	11,412	5,878	765	1,084	3,125	3,600	n.a.	14,403	0
Lakes											
Siltcoos	3,945	3,797	7,178	1,558	2,421	715	2,256	1,065	2,832	3,885	3,056
Tahkenitch	5,675	3,413	3,691	1,085	1,249	269	1,678	1,405	1,526	2,398	1,586
Tenmile	9,302	6,449	11,141	2,086	4,374	318	2,770	4,963	5,364	13,381	3,407
Mid-South Coast											
Coos River	9,414	6,884	38,880	3,030	4,624	2,689	7,292	13,289	n.a.	n.a.	7,370
Coquille River	5,911	23,637	41,660	3,357	9,494	4,641	5,688	11,841	n.a.	n.a.	19,078
Floras Creek	2,502	1,936	1,022	1,585	942	693	628	904	n.a.	n.a.	871
Sixes River	34	567	410	168	120	69	174	155	n.a.	n.a.	113
MSC Dependents	48	32	105	0	0	0	10	23	n.a.	n.a.	0

n.a. = Survey effort was reduced (COVID19 budget cuts) to a point so far below goal that no estimate was produced.

Table B-4. Concluded.

Stratum and Population	2023
North Coast	
Necanicum River	1,637
Nehalem River	14,388
Tillamook Bay	13,325
Nestucca River	3,894
NC Dependents	1,893
Mid-Coast	
Salmon River	1,249
Siletz River	5,410
Yaquina River	5,833
Beaver Creek	943
Alesea River	7,653
Siuslaw River	21,391
MC Dependents	83
Umpqua	
Lower Umpqua River	5,263
Middle Umpqua River	9,652
North Umpqua River	7,071
South Umpqua River	8,810
Lakes	
Siltcoos	2,006
Tahkenitch	1,357
Tenmile	9,033
Mid-South Coast	
Coos River	24,020
Coquille River	7,707
Floras Creek	369
Sixes River	19
MSC Dependents	0

n.a. = Survey effort was reduced (COVID19 budget cuts) to a point so far below goal that no estimate was produced.

APPENDIX D

Table D-1. Site status of 2023 GRTS samples in the Lower Columbia River ESU by TRT population. Target sites fell within Coho Salmon spawning habitat; response sites were successfully surveyed, and non-response sites were not surveyed because of issues such as lack of landowner permission, site inaccessibility, or gaps in survey effort usually from stream turbidity. Non-target sites are outside of Coho Salmon spawning habitat. The average is for 2014 to 2022.

Stratum	Population	Target response				Target non-response				Non-target			
		2023	Avg.	Min	Max	2023	Avg.	Min	Max	2023	Avg.	Min	Max
Coast	Youngs Bay	0	0	0	0	0	0	0	0	0	0	0	0
	Big Creek	0	0	0	0	0	0	0	0	0	0	0	0
	Clatskanie	26	20	11	25	3	6	0	16	0	1	0	3
	Plympton Cr	1	1	1	2	0	0	0	0	0	0	0	0
	Scappoose	19	14	8	18	16	20	10	28	0	0	0	2
	Total	46	35	27	40	19	26	15	39	0	2	0	3
Cascade	Clackamas	20	19	12	30	21	20	11	29	2	0	0	1
	Eagle Cr	10	7	3	9	3	5	0	12	0	0	0	0
	Sandy	23	27	8	35	30	20	14	46	0	1	0	2
	Total	53	52	24	64	54	45	27	83	2	1	0	3
Gorge	Lower Gorge	2	2	0	6	0	4	2	6	0	0	0	1
	Hood	3	3	0	5	0	2	0	6	0	1	0	2
	Total	5	5	0	8	0	6	2	12	0	1	0	2
ESU Total		104	92	52	105	73	77	46	129	2	4	1	8

Table D-2. Site status of 2023 GRTS samples in the Oregon Coast ESU by population. Target sites fell within Coho Salmon spawning habitat; response sites were successfully surveyed, and non-response sites were not surveyed because of issues such as lack of landowner permission, site inaccessibility, or gaps in survey effort usually from stream turbidity. Non-target sites are outside of Coho Salmon spawning habitat. The average is for 2014 to 2022.

Stratum	Population	Target response				Target non-response				Non-target			
		2023	Avg.	Min	Max	2023	Avg.	Min	Max	2023	Avg.	Min	Max
North Coast	Necanicum	11	13	6	18	9	7	1	16	2	1	0	2
	Nehalem	13	16	5	24	19	10	1	24	3	4	2	8
	Tillamook	17	17	8	25	11	8	3	18	0	2	0	5
	Nestucca	14	14	7	23	13	11	4	19	2	5	3	9
	NC Depend.	8	7	4	9	1	2	1	4	2	3	2	4
	Total	63	66	30	92	53	39	20	77	9	15	11	24
Mid-Coast	Salmon	6	10	5	17	15	12	8	17	1	0	0	1
	Siletz	14	19	12	26	15	6	1	14	12	5	3	9
	Yaquina	18	17	10	22	12	6	3	9	4	3	1	6
	Beaver	4	4	3	5	0	1	0	3	0	0	0	1
	Alsea	18	18	11	24	10	8	3	16	2	1	1	2
	Siuslaw	15	17	12	23	14	8	3	14	1	2	1	4
	MC Depend.	2	8	5	11	7	3	2	6	1	0	0	1
	Total	77	92	65	114	73	44	26	70	21	13	7	20
Lakes	Siltcoos	0	0	0	0	0	0	0	0	0	0	0	0
	Tahkenitch	0	0	0	0	0	0	0	0	0	0	0	0
	Tenmile	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0
Umpqua	L. Umpqua	17	16	11	20	13	11	7	21	0	1	0	3
	M. Umpqua	13	13	6	17	17	16	11	22	3	2	1	4
	N. Umpqua	1	1	0	3	5	6	4	9	1	0	0	1
	S. Umpqua	15	15	9	20	17	13	8	17	1	2	0	5
	Total	46	46	30	55	52	45	33	59	5	6	3	12
Mid-South Coast	Coos	17	18	11	22	13	7	2	13	2	2	0	4
	Coquille	17	18	11	24	24	15	9	21	1	2	0	4
	Floras	5	10	1	22	28	18	8	27	5	3	1	6
	Sixes	6	9	3	16	14	8	2	16	1	0	0	1
	MS Depend.	0	2	0	6	15	10	4	18	4	4	1	7
	Total	45	56	34	79	94	59	44	87	13	11	5	18
ESU Total		231	259	191	322	272	188	132	269	48	45	32	63

Table D-3. Adult Coho Salmon density (AUC/mile) and marked proportion information for valid GRTS surveys by population in the Lower Columbia River and Oregon Coast ESUs during the 2023 spawning year. Averages in *italics* do not include data for all years.

Location ESU / <i>Stratum</i> / Population	Total Surveys	Survey Miles	Sample of marks * dead (live)	2023 Density	2014-22 Avg. Density	2023 % Marked	2014-22 Avg. % Marked
Lower Columbia River ESU							
<i>Coastal Stratum</i>							
Youngs Bay	0	--	--	--	--	--	--
Big Creek	0	--	--	--	--	--	--
Clatskanie ^a	26	24.5	37	15.7	14.7	2.7%	15.8%
Plympton Creek	1	1.0	4 (58)	47.9	87.5	82.7%	76.9%
Scappoose	19	14.9	29	9.3	8.9	0.0%	1.2%
<i>Cascade Stratum</i>							
Clackamas River ^a	20	16.7	3 (59)	3.8	4.7	4.4%	14.3%
Eagle Creek	10	11.1	86	10.7	14.1	68.9%	65.0%
Sandy River	23	22.8	35	35.3	25.4	0.0%	2.9%
<i>Gorge Stratum</i>							
Lower Gorge	2	0.8	5 (183)	181.5	73.8	7.8%	15.7%
Hood River	3	1.1	48	118.3	83.2	100%	60.5%
Oregon Coast ESU							
<i>North Coast Stratum</i>							
Necanicum River	11	7.4	24	30.4	24.5	8.3%	2.1%
Nehalem River	13	10.1	34	29.5	30.2	0.0%	0.6%
Tillamook Bay	17	13.6	75	59.4	26.3	1.3%	0.4%
Nestucca River	14	11.6	63	30.0	38.6	0.0%	0.4%
NC Dependents	8	4.8	1 (129)	39.2	30.3	0.0%	0.8%
<i>Mid-Coast Stratum</i>							
Salmon River	6	5.2	24	32.5	20.2	0.0%	1.9%
Siletz River	14	10.7	32	38.7	57.5	0.0%	0.2%
Yaquina River	18	12.1	31	38.5	52.6	0.0%	0.5%
Beaver Creek	4	2.2	10	74.0	149.6	0.0%	0.5%
Alsea River	18	13.8	45	27.7	39.1	4.4%	0.1%
Siuslaw River	15	10.6	16	23.7	25.1	0.0%	0.1%
MC Dependents	2	2.2	0 (1)	0.6	6.8	0.0%	1.6%
<i>Lakes Stratum</i>							
Siltcoos Lake	0	--	--	--	--	--	--
Tahkenitch Lake	0	--	--	--	--	--	--
Tenmile Lake	0	--	--	--	--	--	--
<i>Mid-South Coast Str.</i>							
Coos Bay	17	15.3	129	113.8	52.0	0.0%	0.2%
Coquille River	17	11.3	19	26.8	40.4	0.0%	0.0%
Floras Creek	5	3.0	1 (9)	4.0	16.8	0.0%	0.0%
Sixes River	6	4.0	0 (1)	0.3	4.7	0.0%	0.0%
MS Dependents	0	0.0	0 (0)	--	0.6	--	0.6%
<i>Umpqua Stratum</i>							
Lower Umpqua	17	12.9	15	11.6	37.8	0.0%	0.3%
Middle Umpqua	13	11.1	71	24.0	13.6	0.0%	0.2%
North Umpqua	1	0.4	0 (0)	0.0	2.2	--	3.4%
South Umpqua	15	13.3	25	11.7	8.5	0.0%	10.0%

a = Stratified sampling. Results for population excluding the sub-area listed below.

* = Use carcass (i.e., dead) sample only if greater than 10, otherwise use both live and dead sample.

Table D-4. The percentage of selected GRTS sites classified “Target Response” that were included in abundance estimates based on non-standard criteria (i.e., some level of relaxed criteria). Average, Minimum and Maximum are for 2014 to 2022. n.a. = not available.

Stratum	Population	Percent by Relaxed Criteria			
		2023	Avg.	Min	Max
Coastal	Youngs Bay	n.a.	n.a.	n.a.	n.a.
	Big Creek	n.a.	n.a.	n.a.	n.a.
	Clatskanie	37.0%	0.0%	0.0%	0.0%
	Scappoose	57.9%	3.3%	0.0%	30.0%
	Total	45.7%	0.9%	0.0%	8.3%
Cascade	Clackamas	60.0%	2.1%	0.0%	14.3%
	Sandy	8.7%	8.1%	0.0%	47.6%
	Total	37.7%	4.5%	0.0%	17.2%
Gorge	Lower Gorge	0.0%	0.0%	0.0%	0.0%
	Hood	0.0%	2.9%	0.0%	20.0%
	Total	0.0%	2.0%	0.0%	14.3%
Lower Columbia ESU Total		39.4%	3.0%	0.0%	12.5%
North Coast	Necanicum	63.6%	14.2%	0.0%	66.7%
	Nehalem	53.8%	21.3%	0.0%	80.0%
	Tillamook	47.1%	14.9%	0.0%	63.6%
	Nestucca	42.9%	16.5%	0.0%	57.1%
	NC Depend.	37.5%	3.7%	0.0%	33.3%
	Total	49.2%	15.0%	0.0%	50.0%
Mid Coast	Salmon	50.0%	34.7%	0.0%	100.0%
	Siletz	21.4%	11.5%	0.0%	50.0%
	Yaquina	22.2%	4.7%	0.0%	31.6%
	Beaver	0.0%	11.9%	0.0%	40.0%
	Alsea	22.2%	4.9%	0.0%	27.8%
	Siuslaw	13.3%	7.1%	0.0%	27.3%
	MC Depend.	0.0%	7.5%	0.0%	42.9%
	Total	20.8%	10.1%	0.0%	20.2%
Lakes	Siltcoos	n.a.	n.a.	n.a.	n.a.
	Tahkenitch	n.a.	n.a.	n.a.	n.a.
	Tenmile	n.a.	n.a.	n.a.	n.a.
	Total	n.a.	n.a.	n.a.	n.a.
Umpqua	L. Umpqua	0.0%	12.2%	0.0%	33.3%
	M. Umpqua	7.7%	32.4%	0.0%	75.0%
	N. Umpqua	0.0%	50.0%	0.0%	100.0%
	S. Umpqua	20.0%	13.4%	0.0%	68.4%
	Total	8.7%	19.3%	0.0%	58.2%
Mid-South Coast	Coos	17.6%	9.4%	0.0%	66.7%
	Coquille	52.9%	25.7%	0.0%	100.0%
	Floras	40.0%	14.0%	0.0%	86.4%
	Sixes	83.3%	24.3%	0.0%	100.0%
	MS Depend.	n.a.	25.0%	0.0%	100.0%
	Total	42.2%	20.6%	0.0%	77.8%
Oregon Coast ESU Total		30.3%	14.9%	0.0%	45.5%

Table D-5. The percentage of selected GRTS sites classified as “Target Non-Response” in three main categories. No AUC - Site surveyed but didn’t meet inclusion criteria for estimates. Denied - Sites not surveyed; lacked access permission. Inaccessible - Sites not surveyed, safety concerns or time required (greater than 3 hours). Average, minimum and maximum are for the period 2008 through 2022.

ESU	Strata	Population	No AUC				Denied				Inaccessible			
			2023	Avg.	Min.	Max.	2023	Avg.	Min.	Max.	2023	Avg.	Min.	Max.
Lower Columbia River	Coastal	Youngs Bay	n.a.	8.2%	0.0%	24.1%	n.a.	3.2%	0.0%	8.7%	n.a.	1.7%	0.0%	8.7%
		Big Creek	n.a.	22.0%	0.0%	37.5%	n.a.	3.3%	0.0%	8.3%	n.a.	0.0%	0.0%	0.0%
		Clatskanie	3.3%	12.3%	0.0%	42.3%	6.7%	7.9%	0.0%	23.1%	0.0%	1.1%	0.0%	4.5%
		Scappoose	2.9%	7.1%	0.0%	13.8%	31.4%	27.2%	10.3%	52.8%	0.0%	1.3%	0.0%	5.7%
	Cascade	Clackamas	5.8%	18.0%	4.5%	37.8%	7.8%	13.1%	2.9%	32.7%	0.0%	1.4%	0.0%	7.5%
		Sandy	11.5%	8.2%	0.0%	28.2%	4.9%	3.8%	0.0%	11.5%	21.3%	12.2%	4.8%	24.4%
	Gorge	Lower Gorge	0.0%	2.4%	0.0%	33.3%	0.0%	0.0%	0.0%	0.0%	0.0%	9.0%	0.0%	100.0%
		Hood	0.0%	0.0%	0.0%	0.0%	0.0%	3.2%	0.0%	16.7%	0.0%	11.4%	0.0%	100.0%
Oregon Coast	North Coast	Necanicum	0.0%	5.4%	0.0%	25.8%	0.0%	4.7%	0.0%	12.0%	4.5%	7.7%	0.0%	19.2%
		Nehalem	8.6%	16.6%	0.0%	66.7%	5.7%	2.6%	0.0%	9.5%	8.6%	4.4%	0.0%	9.5%
		Tillamook Bay	0.0%	10.8%	0.0%	47.7%	7.1%	6.2%	2.0%	13.3%	3.6%	5.3%	0.0%	15.6%
		Nestucca	0.0%	15.9%	0.0%	41.9%	3.4%	7.2%	2.1%	16.7%	3.4%	6.5%	0.0%	17.1%
		NC Depend.	0.0%	3.9%	0.0%	18.2%	9.1%	7.5%	2.6%	13.3%	0.0%	0.6%	0.0%	3.2%
	Mid Coast	Salmon	13.6%	20.9%	0.0%	47.6%	9.1%	6.6%	0.0%	11.5%	18.2%	19.1%	0.0%	37.5%
		Siletz	12.2%	11.3%	0.0%	36.6%	2.4%	1.1%	0.0%	5.9%	4.9%	4.8%	0.0%	9.1%
		Yaquina	5.9%	9.9%	0.0%	26.8%	20.6%	10.7%	6.3%	18.0%	2.9%	3.2%	0.0%	13.3%
		Beaver Creek	0.0%	11.7%	0.0%	35.7%	0.0%	3.6%	0.0%	16.7%	0.0%	0.0%	0.0%	0.0%
		Alsea	13.3%	5.8%	0.0%	15.0%	13.3%	15.3%	8.5%	25.0%	3.3%	1.8%	0.0%	6.9%
		Siuslaw	16.7%	13.6%	0.0%	51.3%	6.7%	6.5%	2.4%	13.3%	6.7%	6.5%	3.2%	16.7%
		MC Depend.	50.0%	10.0%	0.0%	21.8%	20.0%	14.5%	3.6%	22.2%	0.0%	1.6%	0.0%	6.1%
	Lakes	Siltcoos Lake	n.a.	3.8%	0.0%	20.0%	n.a.	19.2%	11.1%	36.4%	n.a.	6.5%	3.0%	11.1%
		Tahkenitch Lake	n.a.	6.3%	0.0%	30.8%	n.a.	5.5%	0.0%	15.4%	n.a.	0.0%	0.0%	0.0%
		Tenmile Lake	n.a.	3.3%	0.0%	13.3%	n.a.	28.9%	18.2%	43.3%	n.a.	7.7%	2.6%	15.2%
	Mid-South Coast	Coos Bay	12.5%	12.7%	0.0%	62.2%	12.5%	10.0%	4.7%	16.1%	3.1%	1.7%	0.0%	6.7%
		Coquille	11.9%	9.0%	0.0%	36.7%	26.2%	22.1%	14.8%	31.6%	9.5%	8.1%	1.9%	15.0%
		Floras Creek	13.2%	20.8%	0.0%	51.9%	42.1%	24.5%	9.7%	31.3%	5.3%	6.0%	2.9%	11.8%
		Sixes	19.0%	21.6%	0.0%	63.2%	38.1%	16.7%	5.0%	28.6%	4.8%	6.8%	0.0%	11.8%
		MS Depend.	10.5%	3.3%	0.0%	13.0%	68.4%	56.3%	35.0%	78.3%	0.0%	0.6%	0.0%	4.5%
	Umpqua	Lower Ump.	13.3%	12.2%	3.2%	40.5%	10.0%	8.6%	2.4%	19.4%	10.0%	11.5%	7.1%	21.6%
		Middle Ump.	12.1%	21.0%	7.7%	41.4%	24.2%	19.0%	7.7%	26.5%	6.1%	3.6%	0.0%	11.8%
		North Ump.	42.9%	30.4%	0.0%	80.0%	14.3%	16.4%	0.0%	40.0%	0.0%	2.1%	0.0%	12.2%
South Ump.		9.1%	12.3%	0.0%	39.3%	36.4%	17.6%	8.5%	25.8%	6.1%	4.8%	0.0%	9.1%	

