

THE OREGON PLAN for Salmon and Watersheds



**Western Oregon Adult Coho Salmon,
2017 Spawning Survey Data Report**

Report Number: OPSW-ODFW-2018-3



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Oregon Plan for Salmon and Watersheds

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SUMMARY

This report provides a summary of results from Coho Salmon spawning ground surveys conducted in Lower Columbia (Oregon side only) and Oregon Coast basins during the 2017 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: <http://odfw.forestry.oregonstate.edu/spawn/index.htm>).

Wild Coho spawner abundance in the Lower Columbia River (LCR) Evolutionary Significant Unit (ESU) was above the 15-year average, while estimates in the Oregon Coast (OC) Coho ESU were well below the 26-year average. In the Oregon portion of the LCR Coho ESU there were insufficient surveys to meet precision goals. In the OC Coho ESU sufficient surveys were conducted to meet the precision goal for the ESU, two of four strata, and one of 21 populations. Surveys were not conducted in the Southern Oregon/Northern California Coast (SONCC) Coho ESU. Monitoring of wild Coho Salmon spawners in the SONCC Coho ESU is based on the Huntley Park seining estimate and those results are provided below.

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 Coho ESU; the Oregon Coast Coho ESU; and the Southern Oregon/Northern California Coast Coho ESU. Boundaries and population structures of the Oregon Coho Salmon ESUs are presented in Figure 1. This report summarizes results for Coho Salmon populations in the portion of each ESU within Oregon.

A brief history of sampling designs used over the years is available in prior years ODFW status reports (e.g. Sounhein et al. 2017). Field methods for establishing and conducting salmon spawning ground surveys are described in ODFW procedures manuals (ODFW 2018a, ODFW 2018b). The trapezoidal Area-Under-the-Curve (AUC) technique is used to estimate the number of adult Coho Salmon spawning in a given 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 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. There are

currently five such locations in the LCR Coho ESU including: one dam (River Mill on the Clackamas River), three hatchery weirs (Big Creek, Klaskanine, and Sandy hatcheries), and one OPSW life-cycle monitoring site (Bonnie Falls Trap). In these five locations, counts of adult Coho Salmon passed up-stream are added to the estimated abundance of Coho Salmon spawners below the facilities.

In the OC Coho 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 Coho Salmon collected and retained at Rock Creek Hatchery, and for angler harvest of Coho Salmon in the North Umpqua River above Winchester Dam. 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).

Long-term monitoring of Coho Salmon spawners in the SONCC Coho ESU currently relies on a mark-recapture effort, based on adipose fin-clipped Coho Salmon. Details of this method are described in Jacobs et.al. (2002); the method provides an estimate of adult Coho Salmon escapement to the Rogue basin above Huntley Park (river mile 8). These estimates are adjusted for Coho Salmon collected and retained at Cole Rivers Hatchery, as well as angler harvest in the Rogue basin above Huntley Park.

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 patterns across the monitoring area for the 2017 season were highly variable, with significant flow events beginning earlier than normal in October and then subsequently dropping to half of normal through much of December. Temperatures were near normal for the entire survey season, October 2017 through January 2018. Precipitation was generally near normal, with the exception of much of December which saw rainfall at about 40% of average. These weather patterns presented some challenges, but were generally conducive to conducting spawning ground surveys. The standard inclusion criteria was used to determine which sites were included in abundance estimates. Standard criteria were also used for determining pHOS in all areas except the North and Mid-Coast Dependent Populations in the OC Coho ESU, and in Plympton Creek (sub-area of Clatskanie Population) in the LC Coho ESU.

Survey Effort

Lower Columbia River Coho ESU

- Survey effort was similar to recent years (Table 1).
- The percentage of sites successfully surveyed was below the previous 5-year average (Table D-1).
- Surveys were not conducted in four populations: Youngs Bay and Big Creek (budget constraints) as well as Lower Gorge and Hood River (post fire danger).
- Conditions were generally amenable to survey protocols.

Oregon Coast Coho ESU

- Survey effort was similar to recent years (Table 4).
- The percentage of sites successfully surveyed was similar to the previous 5-year average (Table D-2).
- All populations were surveyed.
- Conditions were generally amenable to survey protocols.

Southern Oregon/Northern California Coast Coho ESU

- No random survey effort in 2017.

Spawner Abundance

Lower Columbia River Coho ESU

- Total wild adult coho spawner abundance (10,934) was well above the previous 15-year average (7,092 wild adults, Table 3 and Figure 2).
- Spawner abundance estimates in individual populations varied relative to long-term averages. The Clackamas population was greater than 200% of average, while the Scappoose population was about 50% of average.
- The 2017 estimate of 9,982 wild spawners in the Cascade stratum is the second highest in sixteen years of monitoring.

Oregon Coast Coho ESU

- Total wild adult coho spawner abundance (61,377) was about half of the previous 26-year average (129,928 wild adults, Table 6 and Figure 5).
- Wild spawner abundance was below average in almost all populations (Table 6).
- Abundance in the Lakes stratum was the lowest ever recorded in the 58 years of monitoring.

Southern Oregon/Northern California Coast Coho ESU

- Total wild adult coho spawner abundance (4,506) was below the 23-year average (6,256 wild adults, Table 7 and Figure 9).

Distribution and Timing

Lower Columbia River Coho ESU

- Spawn timing was similar to the previous 15-year average (Figure 4).
- Wild coho site occupancy at the ESU scale was slightly below average (Table 2). This was also true for all Strata and populations, except the Sandy population.

Oregon Coast Coho ESU

- Spawn timing in 2017 was protracted compared to the long term average, with a late peak in January (Figure 8).
- Wild coho site occupancy at the ESU scale was slightly below average (Table 5) and was more variable at the strata and population scales. Site occupancy in 15 of 24 populations was below average (Table 5).

Southern Oregon/Northern California Coast Coho ESU

- No distribution or timing data available; no random survey effort in 2017.

Hatchery Proportion

Lower Columbia River Coho ESU

- Sample sizes for pHOS estimation at the population scale were generally sufficient.
- The proportion of hatchery coho on spawning grounds in the ESU was 9.6%, well below the 15-year average of (Table 3). However, the 2017 results do not include four populations, two of which (Youngs Bay and Big Cr) typically contribute a large portion of hatchery spawners to the ESU total.
- Among individual populations, the lowest pHOS occurred in the Sandy River (0%), while the highest occurred in the Clatskanie (19.3%) (Table 3).

Oregon Coast Coho ESU

- Sample sizes for pHOS estimation at the population scale were generally sufficient.
- The proportion of hatchery coho on spawning grounds in the ESU was 0.6%, well below the 26-year average (Table 6).
- At the population and strata scale, pHOS was below the 26-year average in most all cases. Only two populations had a pHOS higher than 5% in 2017, the North and South Umpqua.
- In the OC ESU, pHOS has generally been decreasing over time, and has consistently been below 5% since 2008 (Figure 5).

Southern Oregon/Northern California Coast Coho ESU

- The proportion of hatchery fish on spawning grounds in the ESU was 2.6%, well below the 23-year average (Table 7).

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.
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Table 1. Lower Columbia River Coho ESU, GRTS spawning survey goals and results for number of surveys and 95% C.I., 2017 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%)			
			2017	2012 to 2016			2017	2012 to 2016		
				Avg.	Min.	Max.		Avg.	Min.	Max.
Coast	Youngs Bay	0	0	4	0	22	n.a.	41%	41%	41%
	Big Creek	0	0	2	0	10	n.a.	36%	36%	36%
	Clatskanie	18	11	19	11	22	47%	30%	21%	40%
	Scappoose	20	15	13	13	24	67%	52%	46%	58%
	Total	38	27	43	35	64	n.a.	29%	21%	41%
Cascade	Clackamas	30	15	18	16	21	92%	57%	33%	110%
	Sandy	30	34	26	21	30	40%	55%	44%	78%
	Total	60	49	49	44	51	42%	40%	33%	58%
Gorge	Lower Gorge	2	0	3	1	6	n.a.	67%	9%	98%
	Hood	2	0	3	1	4	n.a.	97%	23%	191%
	Total	4	0	6	4	8	n.a.	73%	64%	88%
ESU Total		102	76	98	87	116	34%	24%	16%	29%

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 Coho ESU adult Coho Salmon occupancy (total & wild) by population, stratum, and ESU for the 2017 run year and previous 5 year average (2012–16). 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	2017 No. sites surveyed	5 yr. avg. No. sites surveyed	Total Coho Salmon		Wild Coho Salmon	
			2017 % Occupied	5 yr. avg. % Occupied	2017 % Occupied	5 yr. avg. % Occupied
Lower Columbia R. ESU	85	102	44%	48%	41%	47%
Coast Stratum	27	44	48%	60%	44%	59%
Youngs Bay	0	4	n.a.	48%	n.a.	38%
Big Creek	0	2	n.a.	80%	n.a.	80%
Clatskanie River	11	20	64%	71%	64%	70%
Scappoose Creek	15	16	33%	50%	27%	50%
Cascade Stratum	58	52	41%	36%	40%	35%
Clackamas River	15	22	20%	32%	20%	32%
Sandy River	34	26	47%	41%	44%	39%
Gorge Stratum	0	6	n.a.	74%	n.a.	67%
Lower Gorge tribs.	0	3	n.a.	77%	n.a.	63%
Hood River	0	3	n.a.	77%	n.a.	77%

Table 3. Lower Columbia River Coho ESU estimated abundance of adult Coho Salmon spawning naturally by ESU, stratum, and population in the 2017 run year compared to the previous 15 years.

Geographic scale ESU/Stratum/Population		Spawning year			
		2017	2002 to 2016		
			Avg.	Min.	Max.
Lower Columbia River ESU (Oregon Only)	Wild	10,934 *	7,092	2,988	21,849
	Hatchery	1,166 *	2,997	285	12,230
	% Hat.	9.6% *	26.9%	7.8%	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	566	905	167	3,246
	Hatchery	135	36	0	151
	% Hat.	19.3%	5.2%	0.0%	22.3%
Scappoose	Wild	386	722	210	1,960
	Hatchery	8	12	0	67
	% Hat.	2.0%	1.8%	0.0%	9.9%
Cascade Stratum	Wild	9,982	4,668	2,157	16,612
	Hatchery	190	1,868	139	10,871
	% Hat.	6.9%	23.3%	3.5%	71.2%
Clackamas	Wild	7,598	3,219	1,301	10,670
	Hatchery	1,023	1,645	50	10,871
	% Hat.	11.9%	25.7%	1.5%	75.8%
Sandy	Wild	2,384	1,449	382	5,942
	Hatchery	0	119	0	515
	% Hat.	0.0%	9.4%	0.0%	57.4%
Gorge Stratum**	Wild	n.a.	490	34	1,525
	Hatchery	n.a.	700	25	2,555
	% Hat.	n.a.	50.6%	23.1%	72.9%
Lower Gorge Tribs.**	Wild	n.a.	293	30	920
	Hatchery	n.a.	280	10	1,512
	% Hat.	n.a.	43.9%	6.2%	85.2%
Hood River**	Wild	n.a.	236	4	1,262
	Hatchery	n.a.	420	0	1,298
	% Hat.	n.a.	56.0%	0.0%	85.3%

* = Does not include data for the Youngs Bay and Big Creek Populations. These populations were not sampled, 2013 through 2017 run years.

** = Surveys not conducted due to fire safety concerns.

Table 4. Oregon Coast Coho ESU, GRTS spawning survey goals, responses, and estimate precision by population, 2017 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%)			
			2017	2012 to 2016			2017	2012 to 2016		
				Avg.	Min.	Max.		Avg.	Min.	Max.
North Coast	Necanicum	13	17	16	11	21	50%	59%	24%	95%
	Nehalem	20	23	19	13	27	37%	45%	38%	51%
	Tillamook	20	19	21	14	27	53%	56%	36%	78%
	Nestucca	20	23	17	9	31	46%	46%	38%	57%
	NC Depend.	7	13	15	6	21	95%	81%	39%	104%
	Total	80	89	86	59	127	24%	28%	22%	39%
Mid-Coast	Salmon	9	7	11	7	17	70%	59%	23%	122%
	Siletz	20	25	20	12	29	46%	39%	31%	47%
	Yaquina	20	22	19	10	27	36%	47%	34%	55%
	Beaver	3	4	6	3	8	60%	42%	24%	61%
	Alsea	20	20	22	11	32	28%	27%	23%	33%
	Siuslaw	20	23	19	12	32	52%	33%	28%	39%
	MC Depend.	8	8	11	6	18	81%	61%	42%	103%
	Total	100	109	108	78	158	22%	17%	15%	19%
Lakes	Siltcoos	0	0	6	0	21	n.a.	51%	46%	56%
	Tahkenitch	0	0	1	0	5	n.a.	65%	61%	69%
	Tenmile	0	0	6	0	18	n.a.	39%	29%	48%
	Total	0	0	13	0	44	n.a.	27%	24%	31%
Umpqua	L. Umpqua	20	16	22	15	30	78%	36%	24%	56%
	M. Umpqua	20	15	16	6	22	58%	55%	29%	80%
	N. Umpqua	3	1	1	0	3	n.a.	n.a.	0%	0%
	S. Umpqua	20	15	19	9	30	46%	67%	37%	92%
	Total	63	47	58	30	84	62%	35%	22%	43%
Mid-South Coast	Coos	20	19	23	18	35	43%	52%	38%	69%
	Coquille	20	19	24	15	34	57%	42%	33%	53%
	Floras	17	11	11	1	22	43%	47%	25%	72%
	Sixes	8	12	10	3	19	57%	68%	25%	101%
	MS Depend	3	0	3	2	3	n.a.	139%	98%	195%
	Total	68	61	71	41	109	36%	31%	25%	37%
ESU Total		311	306	336	229	522	18%	14%	13%	15%

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 Coho ESU adult Coho Salmon occupancy (total & wild) by population, stratum, and ESU for the 2017 run year and previous 5 year average (2012–16). Occupancy = a peak of 4 or more adult Coho Salmon per mile. Wild Occupied = occupied sites with at least one wild Coho Salmon.

ESU, Stratum, and TRT Population	2017 No. sites surveyed	5 yr. avg. No. sites surveyed	Total Coho Salmon		Wild Coho Salmon	
			2017 % Occupied	5 yr. avg. % Occupied	2017 % Occupied	5 yr. avg. % Occupied
Oregon Coast ESU	306	336	60.5%	68.0%	59.2%	66.2%
North Coast Stratum	89	86	64.0%	61.9%	62.9%	58.4%
Necanicum River	17	16	52.9%	73.0%	47.1%	72.1%
Nehalem River	23	19	65.2%	60.0%	65.2%	58.1%
Tillamook Bay	19	21	63.2%	63.3%	63.2%	57.8%
Nestucca River	23	17	78.3%	66.9%	78.3%	62.6%
NC Dependents	7	13	42.9%	44.3%	42.9%	38.1%
Mid-Coast Stratum	109	108	72.5%	79.9%	72.5%	78.4%
Salmon River	7	11	42.9%	62.3%	42.9%	56.7%
Siletz River	25	20	88.0%	85.6%	88.0%	84.7%
Yaquina River	22	19	81.8%	82.1%	81.8%	81.1%
Beaver Creek	4	6	100.0%	100.0%	100.0%	93.3%
Alsea River	20	22	85.0%	93.2%	85.0%	93.2%
Siuslaw River	23	19	56.5%	78.4%	56.5%	77.0%
MC Dependents	8	11	25.0%	44.7%	25.0%	41.8%
Lakes Stratum	0	13	n.a.	78.4%	n.a.	78.4%
Siltcoos Lake	0	6	n.a.	66.1%	n.a.	66.1%
Tahkenitch Lake	0	1	n.a.	100.0%	n.a.	100.0%
Tenmile Lake	0	6	n.a.	83.4%	n.a.	83.4%
Umpqua Stratum	47	58	40.4%	58.3%	40.4%	56.4%
Lower Umpqua River	16	22	62.5%	71.4%	62.5%	69.6%
Mid. Umpqua River	15	16	33.3%	47.2%	33.3%	46.2%
North Umpqua River	1	1	0.0%	n.a.	0.0%	n.a.
South Umpqua River	15	19	26.7%	51.7%	26.7%	48.4%
Mid-South Stratum	61	71	49.2%	63.0%	44.3%	62.1%
Coos River	19	23	57.9%	71.8%	47.4%	71.8%
Coquille River	19	24	42.1%	69.8%	42.1%	69.2%
Floras Creek	11	11	81.8%	77.1%	72.7%	71.5%
Sixes River	12	10	16.7%	32.8%	16.7%	32.8%
MSC Dependents	0	3	n.a.	6.7%	n.a.	6.7%

Table 6. Oregon Coast Coho ESU estimated abundance of adult Coho Salmon spawning naturally by ESU, stratum, and population for the 2017 run year compared to the previous 26 years.

Geographic scale ESU/Stratum/Population	Coho salmon origin	Spawning year			
		2017	1990 to 2016		
			Avg.	Min.	Max.
Oregon Coast Coho ESU	Wild	61,377	129,928	21,139	359,692
	Hatchery	386	9,126	636	26,128
	% Hat.	0.6%	10.5%	0.7%	31.4%
North Coast Stratum	Wild	13,643	21,230	1,524	67,370
	Hatchery	28	2,061	0	15,563
	% Hat.	0.2%	18.7%	0.0%	79.0%
Necanicum River	Wild	529	1,418	97	5,727
	Hatchery	26	119	0	501
	% Hat.	4.7%	15.9%	0.0%	40.1%
Nehalem River	Wild	5,486	11,095	527	32,517
	Hatchery	0	1,569	0	14,014
	% Hat.	0.0%	20.7%	0.0%	87.7%
Tillamook Bay	Wild	2,927	5,300	80	20,090
	Hatchery	0	312	0	1,498
	% Hat.	0.0%	16.8%	0.0%	68.9%
Nestucca River	Wild	4,495	2,781	160	16,698
	Hatchery	0	52	0	274
	% Hat.	0.0%	5.8%	0.0%	15.3%
North Coast Dependents	Wild	206	636	0	4,607
	Hatchery	2	18	0	111
	% Hat.	1.0%	0.9%	0.0%	6.3%
Mid-Coast Stratum	Wild	22,848	36,724	2,444	121,963
	Hatchery	95	2,030	0	9,633
	% Hat.	0.4%	13.4%	0.0%	50.1%
Salmon River	Wild	450	618	5	3,680
	Hatchery	0	619	0	2,621
	% Hat.	0.0%	58.9%	0.0%	97.6%
Siletz River	Wild	5,202	6,394	207	33,094
	Hatchery	0	262	0	962
	% Hat.	0.0%	16.2%	0.0%	58.4%
Yaquina River	Wild	2,491	6,246	317	25,582
	Hatchery	89	173	0	1,526
	% Hat.	3.4%	7.0%	0.0%	25.0%
Beaver Creek	Wild	1,553	1,828	90	6,564
	Hatchery	6	49	0	405
	% Hat.	0.4%	3.6%	0.0%	23.8%
Alsea River	Wild	4,377	6,870	108	28,337
	Hatchery	0	323	0	2,214
	% Hat.	0.0%	15.7%	0.0%	93.8%
Siuslaw River	Wild	7,129	13,242	501	55,445
	Hatchery	0	590	0	4,136
	% Hat.	0.0%	10.4%	0.0%	37.6%
Mid Coast Dependents	Wild	1,646	1,526	51	8,179
	Hatchery	0	30	0	118
	% Hat.	0.0%	1.7%	0.0%	5.9%

Table 6. Continued

Geographic scale ESU/Stratum/Population	Coho salmon origin	Spawning year			
		2017	1990 to 2016		
			Avg.	Min.	Max.
Lakes Stratum	Wild	1,302	14,451	1,973	38,744
	Hatchery	6	52	0	251
	% Hat.	0.5%	0.5%	0.0%	2.2%
Siltcoos Lake	Wild	715	4,030	385	7,998
	Hatchery	0	24	0	124
	% Hat.	0.0%	0.9%	0.0%	8.7%
Tahkenitch Lake	Wild	269	2,872	317	10,681
	Hatchery	6	13	0	107
	% Hat.	2.2%	0.4%	0.0%	3.1%
Tenmile Lake	Wild	318	7,548	1,271	20,385
	Hatchery	0	15	0	123
	% Hat.	0.0%	0.3%	0.0%	3.4%
Umpqua Stratum	Wild	15,492	27,378	3,334	94,655
	Hatchery	257	4,525	434	17,758
	% Hat.	1.6%	18.1%	1.1%	36.0%
Lower Umpqua River	Wild	10,848	9,564	1,257	36,942
	Hatchery	0	260	0	1,484
	% Hat.	0.0%	3.2%	0.0%	15.7%
Middle Umpqua River	Wild	1,788	6,129	563	19,962
	Hatchery	0	217	0	1,259
	% Hat.	0.0%	4.4%	0.0%	20.6%
North Umpqua River	Wild	1,772	2,631	355	9,397
	Hatchery	197	3,189	45	14,094
	% Hat.	10.0%	49.2%	1.1%	84.3%
South Umpqua River	Wild	1,084	9,053	435	49,958
	Hatchery	60	859	0	7,040
	% Hat.	5.2%	13.6%	0.0%	57.2%
Mid-South Coast Stratum	Wild	8,092	30,145	4,890	82,077
	Hatchery	0	458	0	2,766
	% Hat.	0.0%	2.2%	0.0%	23.8%
Coos River	Wild	2,689	13,914	1,112	38,880
	Hatchery	0	205	0	1,387
	% Hat.	0.0%	2.3%	0.0%	36.4%
Coquille River	Wild	4,641	13,759	2,033	55,667
	Hatchery	0	178	0	1,832
	% Hat.	0.0%	1.9%	0.0%	15.4%
Floras Creek	Wild	693	2,645	340	11,329
	Hatchery	0	66	0	400
	% Hat.	0.0%	4.0%	0.0%	22.8%
Sixes River	Wild	69	184	34	567
	Hatchery	0	18	0	182
	% Hat.	0.0%	8.5%	0.0%	65.7%
Mid-South Coast Dependents	Wild	0	106	0	484
	Hatchery	0	2	0	9
	% Hat.	0.0%	1.2%	0.0%	4.6%

Table 7. Southern Oregon/Northern California Coasts Coho ESU estimated abundance of adult Coho Salmon spawning naturally in the 2017 run year compared to the previous 23 years. Rogue River Populations only. NA = Data not available at time of print.

Data component	Coho salmon origin	Spawning year			
		2017	1994 to 2016		
			Avg.	Min.	Max.
SONCC Coho ESU (Rogue Only)	Wild	4,506	6,256	394	24,231
	Hatchery	120	411	0	1,230
	% Hat.	2.6%	6.0%	0.0%	19.2%
Huntley Park Est. ¹	Total	5,412	11,420	572	33,601
	Wild	4,526	6,365	414	24,509
	Hatchery	886	5,055	158	14,013
Freshwater Catch ² Excluding Rogue Bay	Total	NA	310	67	862
	Wild	0	0	0	0
	Hatchery	NA	310	67	862
Cole Rivers Hatchery ³	Total	786	4,458	147	12,298
	Wild	20	109	0	370
	Hatchery	766	4,350	127	11,937

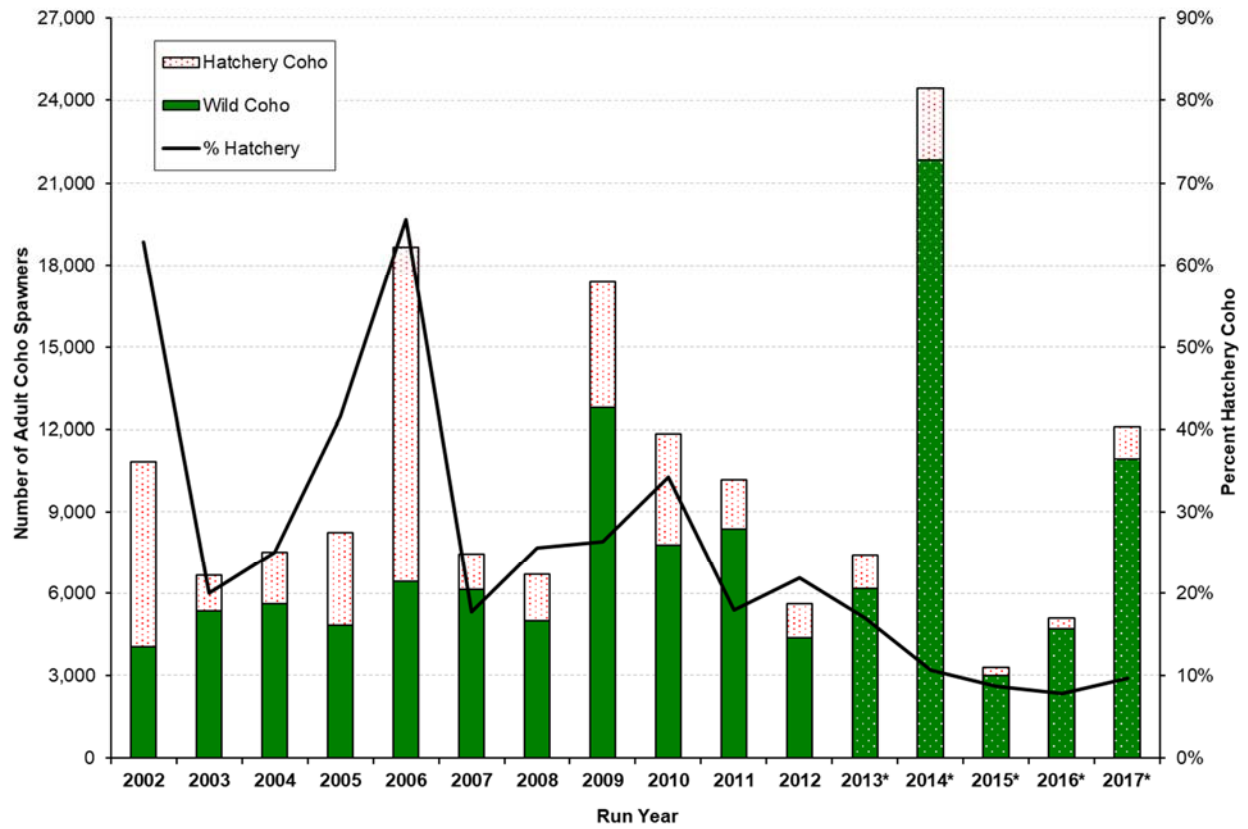
¹ = Huntley Park mark-recapture estimate of Coho Salmon freshwater escapement to the Rogue Basin above Huntley Park (~ River Mile 8). This includes returns to Cole Rivers Hatchery, natural spawning grounds, freshwater harvest and mortality between Huntley and upriver areas.

² = Estimated freshwater harvest of Coho Salmon in the Rouge basin (excluding the Rogue River Bay), based on Angler Harvest Cards (see: <http://www.dfw.state.or.us/resources/fishing/sportcatch.asp>). Selective harvest of only marked Coho Salmon since 2004.

³ = Number of adult Coho Salmon collected and retained at Cole Rivers Hatchery. These numbers do not include Coho Salmon collected and released alive back into the wild.



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



* Estimates for 2013 to 2017 do not include Big Creek, Youngs Bay & Gorge 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).

Figure 2. Lower Columbia River Coho ESU estimated abundance of adult Coho Salmon spawning naturally by rearing origin for the 2002 through 2017 run years.

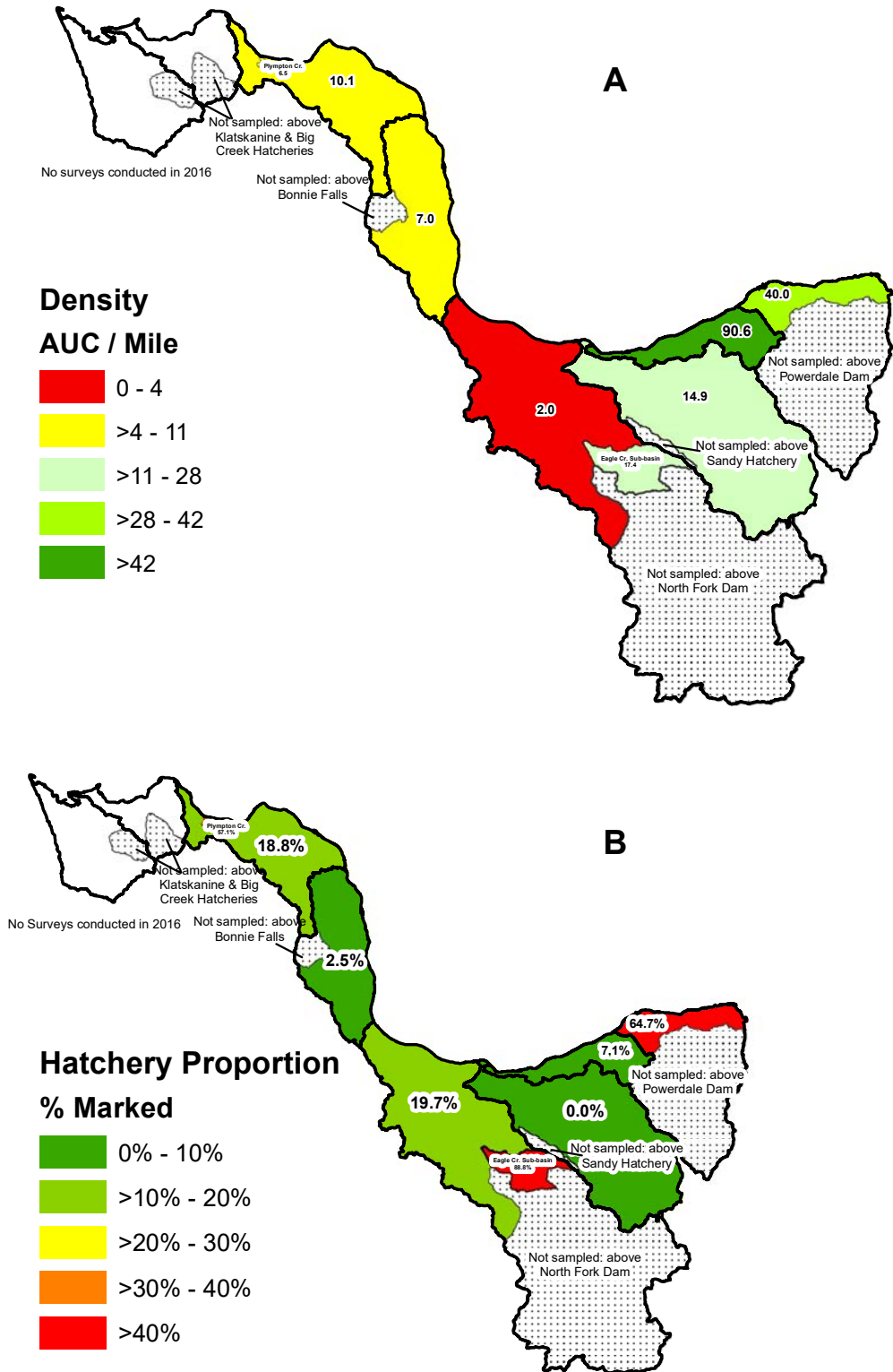


Figure 3. A) Coho salmon density in GRTS surveys by lower Columbia River TRT population, 2017. B) Percentage of marked adult coho salmon in GRTS surveys by lower Columbia River TRT population, 2017.

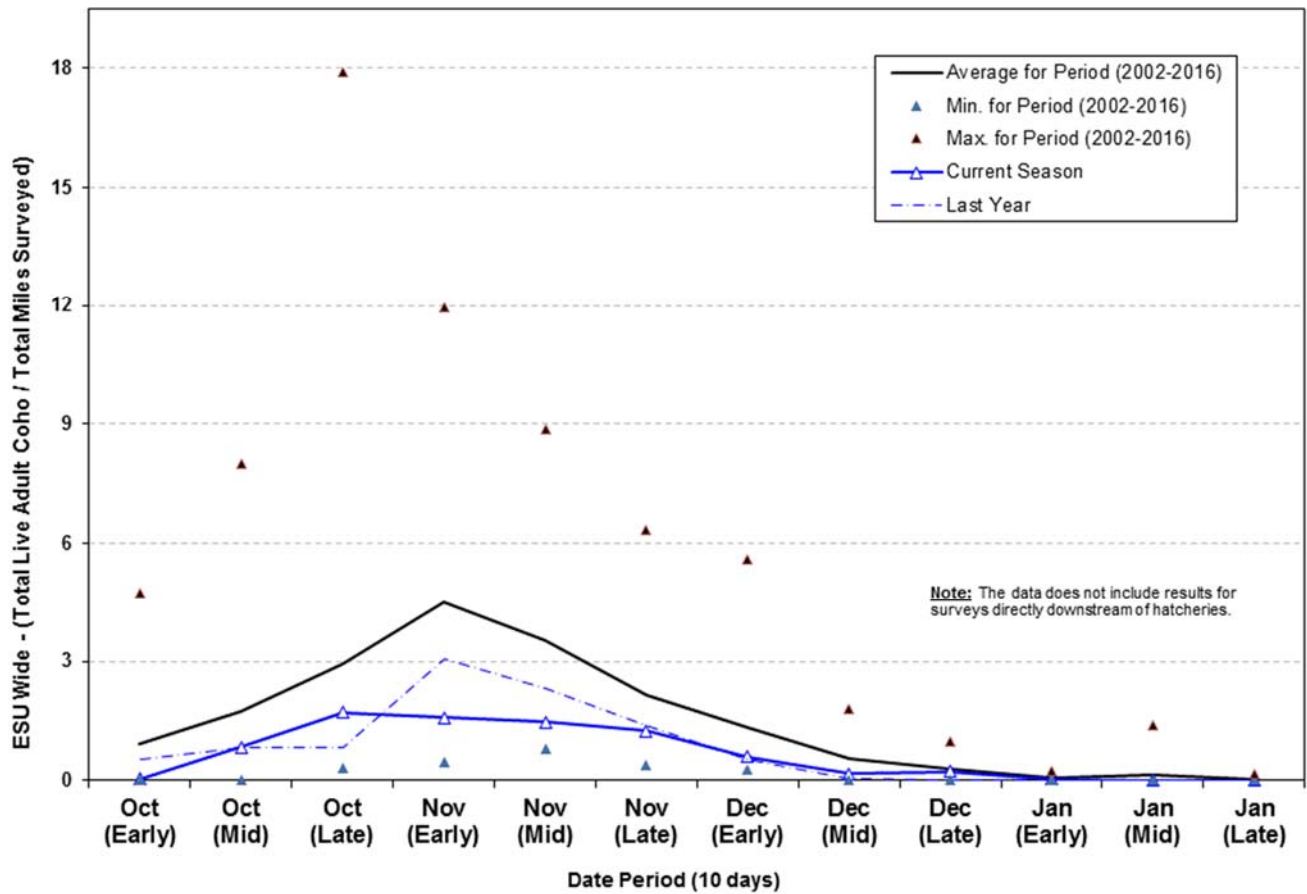


Figure 4. Spawn timing of live adult Coho Salmon in 2017 on GRTS spawning ground surveys in the Lower Columbia River Coho ESU.

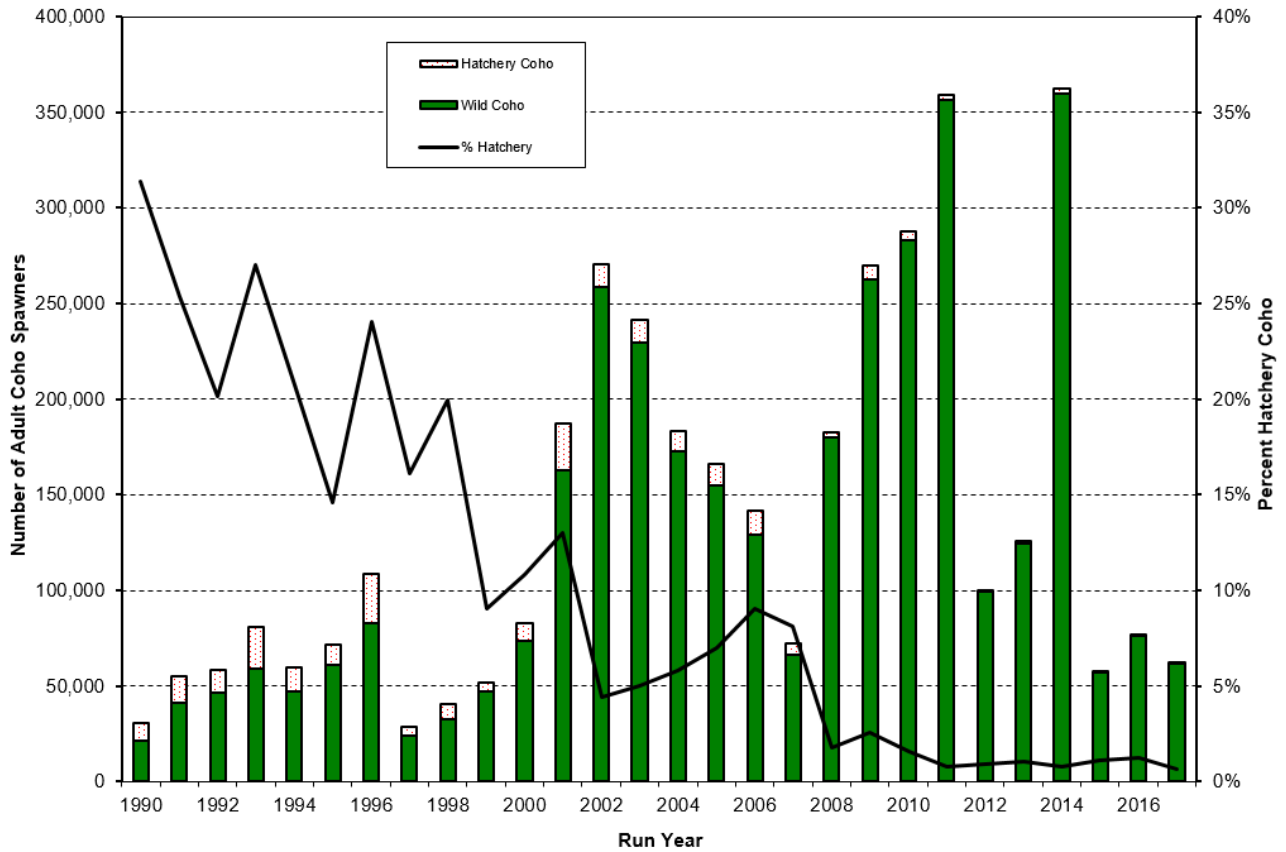


Figure 5. Oregon Coast Coho ESU estimated abundance of adult Coho Salmon spawning naturally by rearing origin for the 1990 through 2017 run years.

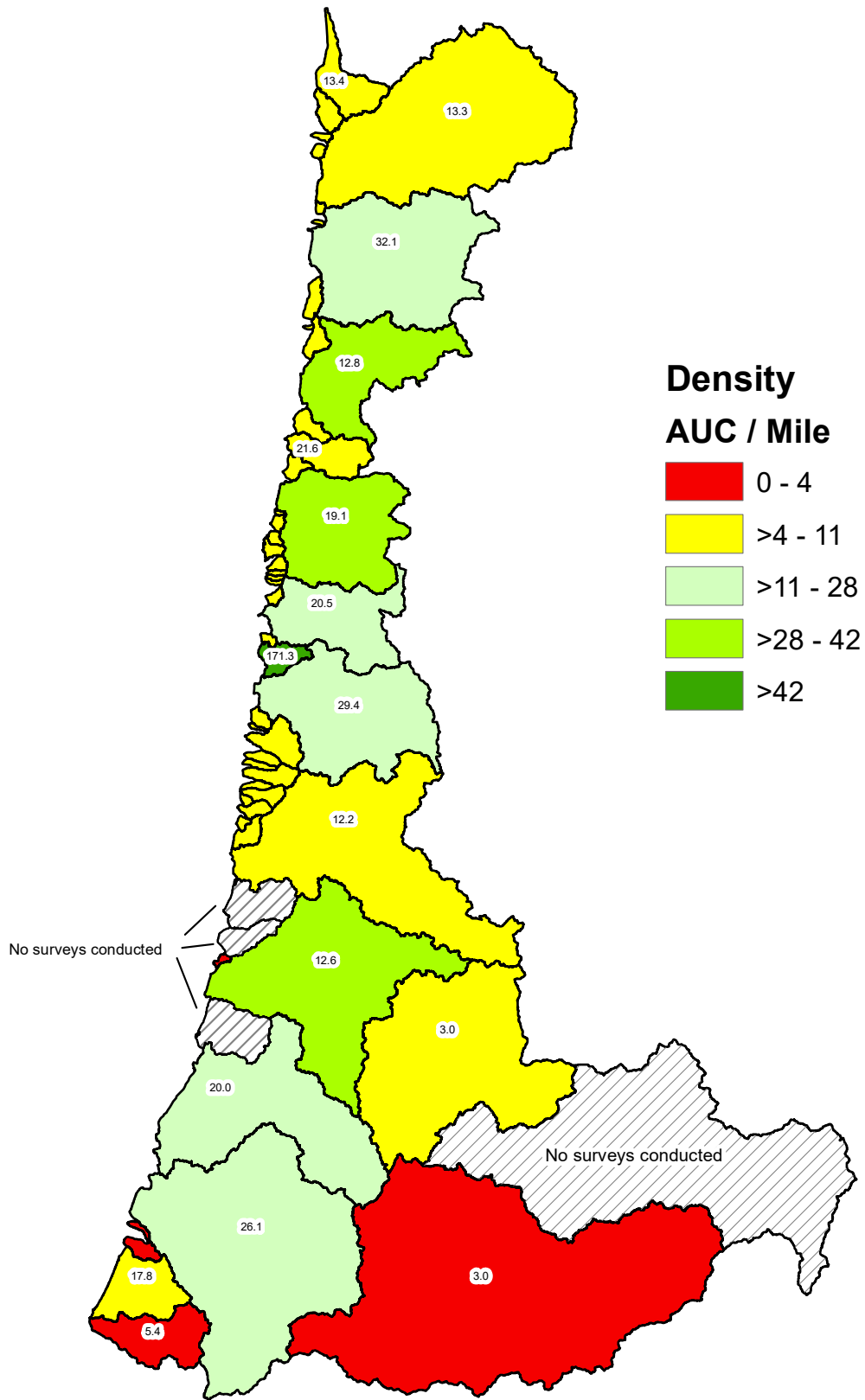


Figure 6. Coho salmon density (AUC/mile) in GRTS surveys by Oregon Coast TRT population, 2017. Functionally independent and potentially independent populations are labeled. For further detail see Appendix Table D-4.

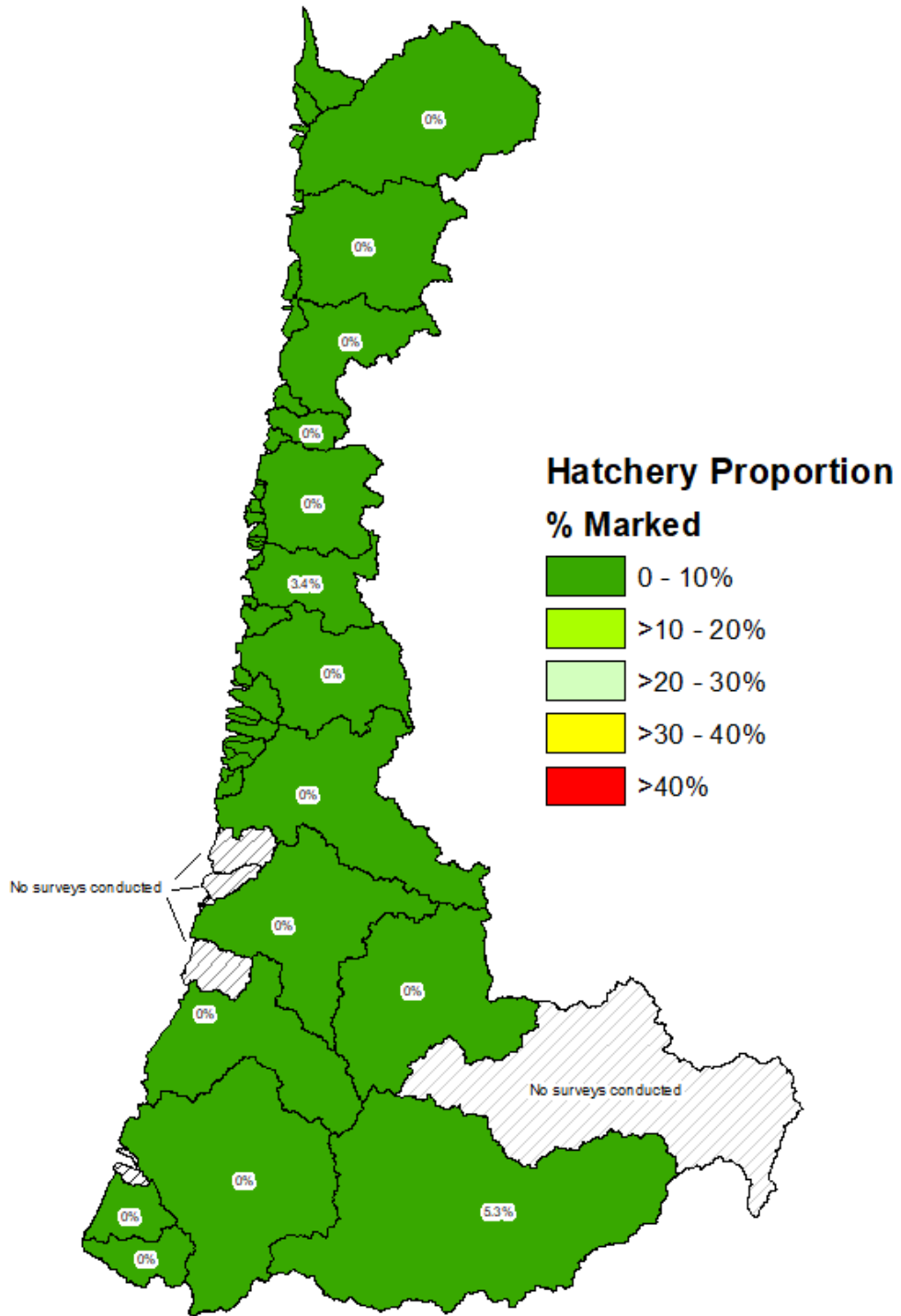


Figure 7. Percentage of marked adult coho salmon in GRTS surveys by Oregon Coast TRT population, 2017. Functionally independent and potentially independent populations are labeled. For further detail see Appendix Table D-4.

Oregon Coast Coho ESU Survey Result Summary for Random Spawning Ground Surveys

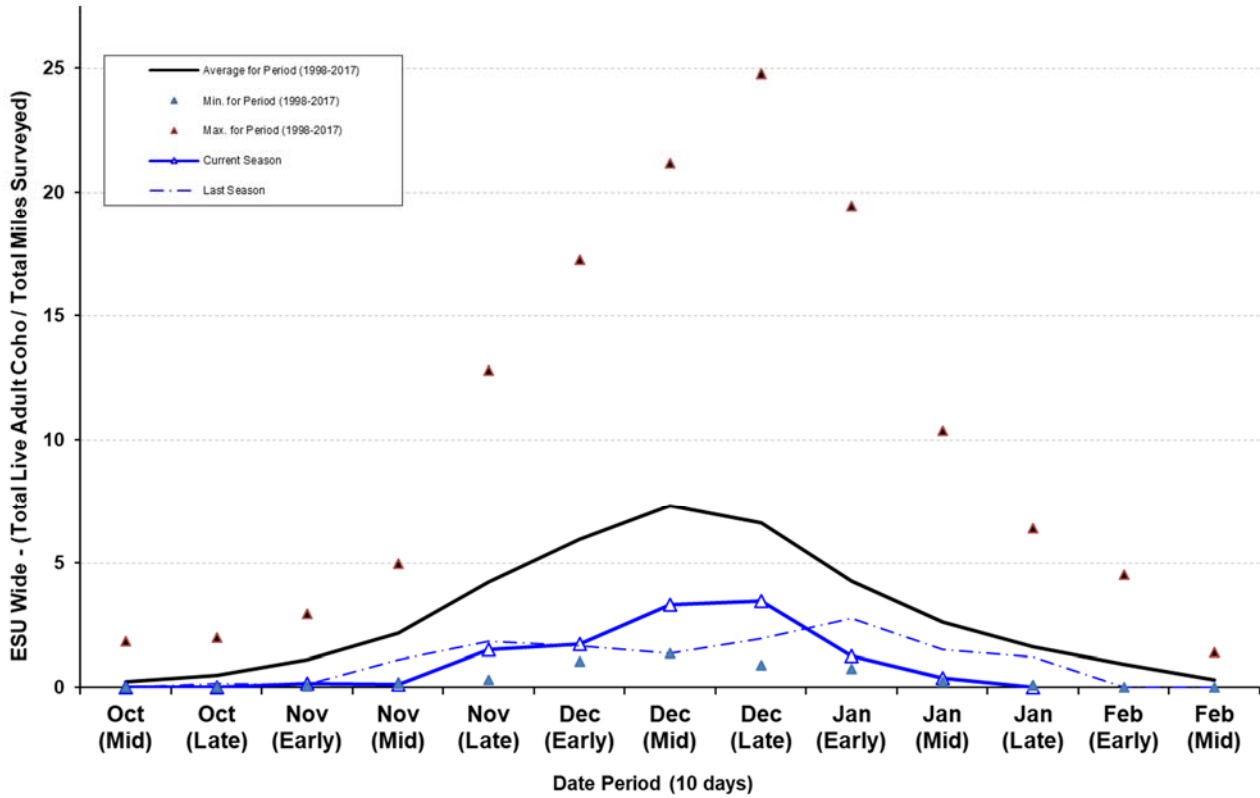


Figure 8. Spawn timing of live adult Coho Salmon in 2017 on GRTS spawning ground surveys in the Oregon Coast Coho ESU.

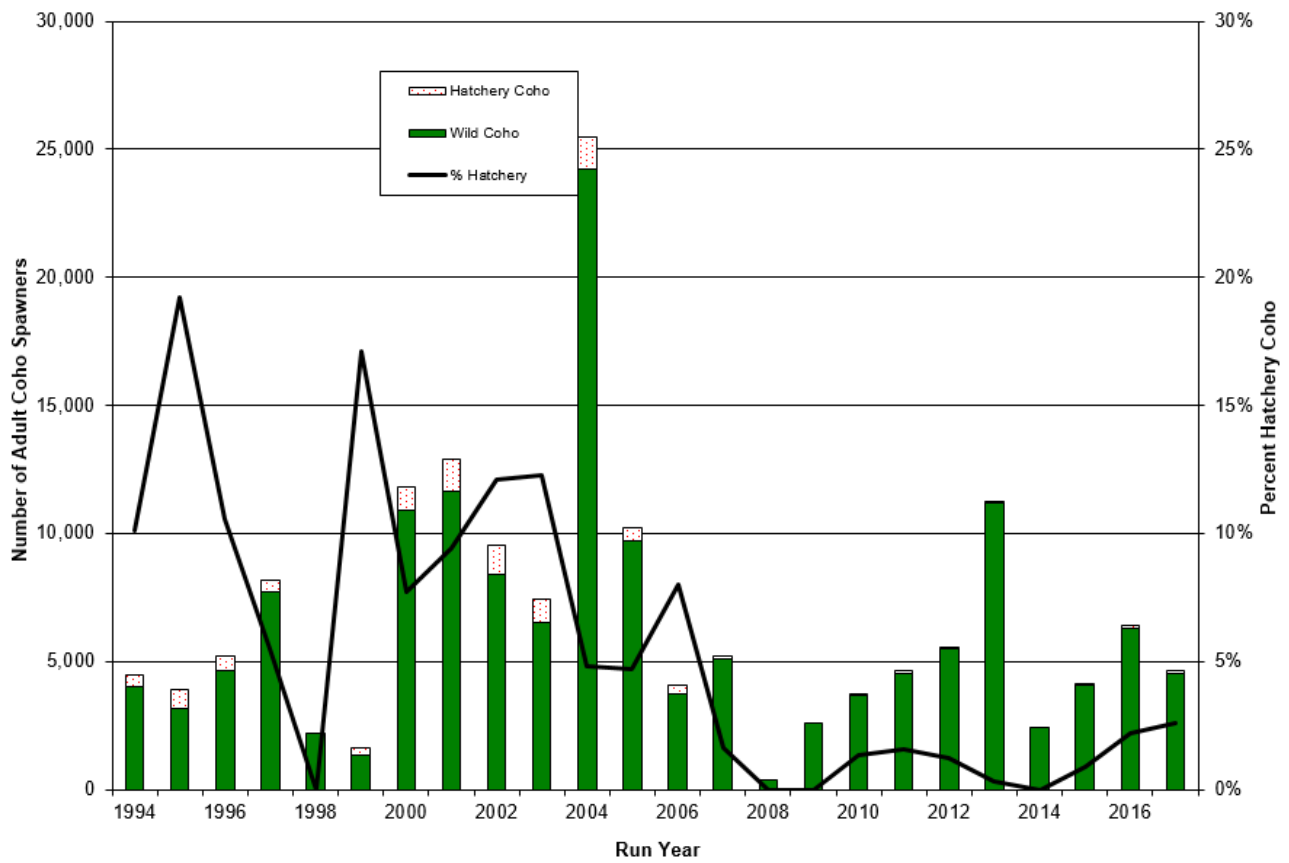


Figure 9. Southern Oregon/Northern California Coasts Coho ESU estimated abundance of adult Coho Salmon spawning naturally by rearing origin for the 1994 through 2017 run years. Abundance based on Huntley seining mark-recapture method.

APPENDIX A (LCR COHO ESU)

Table A-1. Results of randomly selected spawning ground surveys for Coho Salmon in the Oregon portion of the LCR Coho ESU, run year 2017. 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
Lower Columbia River ESU	85	74.3	4,592	1,553	3,423	902
Coast Stratum	27	19.8	1,023	393	879	340
Youngs Bay	0					
Big Creek	0					
Clatskanie River (ex. Plympton)	11	8.8	694	329	564	267
Plympton Cr. (Clatskanie R.)	1	1.0	7	0	0	0
Scappoose River	15	10.0	323	215	315	210
Cascade Stratum	58	54.5	3,568	1,503	2,545	835
Clackamas River (ex. Eagle Cr.)	15	11.9	503	164	404	132
Eagle Creek (Clackamas R.)	9	10.0	1,040	1,253	116	140
Sandy River	34	32.6	2,025	813	2,025	813
Gorge Stratum	0					
Lower Gorge	0					
Hood River	0					

Table A-2. Number of unmarked adult Coho Salmon passed upstream of counting stations into areas without GRTS spawning surveys. Oregon portion of the LCR Coho ESU, run year 2017.

ESU, Stratum, and TRT Population	Counting station	Spawning year			
		2017	2002 to 2016		
			Avg.	Min.	Max.
Lower Columbia River ESU					
Coast Stratum					
Youngs Bay	Klaskanine Hatchery	29	23	2	68
Big Creek	Big Creek Hatchery	263	235	46	606
Scappoose River	Bonnie Falls Trap	71	49	2	136
Cascade Stratum					
Clackamas River	N Fk Clackamas Dam	7,078	2,413	835	8,230
Sandy River	Sandy Hatchery ^a	359	161	36	539
	Marmot Dam	n.a.	809	310	1,173
Gorge Stratum					
Hood River	Powerdale Dam	n.a.	52	27	126

a = Sandy Hatchery count through 2009 is number released above Marmot Dam, which was removed in 2006. Beginning in 2010, Sandy Hatchery releases the fish 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 Coho ESU, run years 2002 through 2017. n.a. = not available.

Return Year	Youngs Bay	Big Creek	Clatskanie*	Scappoose	Clackamas*	Sandy	Lower Gorge	Hood River
2002	411	98	167	502	1,981	382	338	147
2003	113	435	563	336	2,507	1,348	n.a.	41
2004	149	112	398	755	2,874	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	21	212	927	375	3,608	687	126	170
2008	82	360	995	292	1,694	1,277	223	69
2009	26	792	1,195	778	7,982	1,493	468	65
2010	68	279	1,686	1,960	1,757	901	920	223
2011	161	160	1,546	298	2,254	3,494	216	232
2012	129	409	619	210	1,580	1,165	96	169
2013	n.a.	n.a.	611	979	3,202	667	151	561
2014	n.a.	n.a.	3,246	1,587	10,670	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	386	7,598	2,384	n.a.	n.a.

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

APPENDIX B (OC COHO ESU)

Table B-1. Results of randomly selected spawning ground surveys for Coho Salmon in the OC Coho ESU, run year 2017. 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
Oregon Coast ESU	306	226.7	58,397	10,796	58,214	10,790
North Coast Stratum	89	67.3	13,671	3,307	13,643	3,300
Necanicum River	17	10.9	555	278	529	265
Nehalem River	23	17.6	5,486	2,011	5,486	2,011
Tillamook Bay	19	16.5	2,927	1,566	2,927	1,566
Nestucca River	23	17.9	4,495	2,080	4,495	2,080
NC Dependents	7	4.4	208	197	206	
Mid-Coast Stratum	109	76.7	22,854	4,936	22,759	4,929
Salmon River	7	4.5	450	314	450	314
Siletz River	25	20.2	5,202	2,376	5,202	2,376
Yaquina River	22	13.4	2,580	922	2,491	890
Beaver Creek	4	2.1	1,559	942	1,553	938
Alsea River	20	14.7	4,288	1,199	4,288	1,199
Siuslaw River	23	13.9	7,129	3,698	7,129	3,698
MC Dependents	8	7.8	1,646	1,331	1,646	1,331
Umpqua Stratum	47	33.9	13,780	8,530	13,720	8,528
Lower Umpqua River	16	10.5	10,848	8,450	10,848	8,450
Middle Umpqua River	15	11.8	1,788	1,039	1,788	1,039
North Umpqua River	1	0.7				
South Umpqua River	15	10.9	1,144	528	1,084	500
Mid-South Coast Stratum	61	48.8	8,091	2,916	8,091	2,916
Coos River	19	16.1	2,689	1,159	2,689	1,159
Coquille River	19	15.7	4,641	2,659	4,641	2,659
Floras Creek	11	6.8	693	297	693	297
Sixes River	12	10.1	69	39	69	39
MSC Dependents						

Table B-2. Comparison of 2017 run year wild adult Coho Salmon spawners in the Oregon Coastal Lakes populations based on GRTS surveys and calibrated standard surveys.

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
GRTS Surveys							
Lakes Strata	--	--	--	--	--	--	--
Siltcoos	--	--	--	--	--	--	--
Tahkenitch	--	--	--	--	--	--	--
Tenmile	--	--	--	--	--	--	--
Standard Surveys							
Lakes Strata	14	8	6.6	1,302		1,302	
Siltcoos	5	2	2.5	715		715	
Tahkenitch	2	2	1.6	269		269	
Tenmile	7	4	2.5	318		318	

Table B-3. Estimates of adult Coho Salmon run size in the North Umpqua River derived through adjustment of Winchester Dam count. Dam count adjusted for adult Coho Salmon retained by hatchery operations and harvest above Winchester Dam, 2017 compared to the previous 5 years.

Data component	Coho salmon origin	Spawning year			
		2017	2012 to 2016		
			Avg.	Min.	Max.
North Umpqua Coho Salmon	Wild	1,772	2,738	1,148	3,681
	Hatchery	197	340	104	669
	% Hat.	10.0%	9.4%	1.2%	18.2%
GRTS Estimate below Winchester Dam ¹	Total	0	71	0	298
	Wild	0	71	0	298
	Hatchery	0	0	0	0
Winchester Dam ²	Total	1,969	3,078	1,252	3,786
	Wild	1,772	2,738	1,148	3,979
	Hatchery	197	240	104	669
Freshwater Catch ³ Above Winchester Dam	Total	n.a.	36	4	60
	Wild	n.a.	0	0	0
	Hatchery	n.a.	36	4	60
Rock Creek Hatchery ⁴	Total	0	2	0	10
	Wild	0	0	0	0
	Hatchery	0	2	0	10

1 = Estimate of adult Coho Salmon observed in GRTS surveys below Winchester Dam (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 (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 Coho ESU, run years 1990 through 2017. 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. Concluded.

Stratum and Population	2012	2013	2014	2015	2016	2017
North Coast						
Necanicum River	902	798	5,727	847	936	529
Nehalem River	2,963	4,539	30,577	3,079	7,549	5,486
Tillamook Bay	1,686	4,402	20,090	1,345	7,102	2,927
Nestucca River	1,751	946	6,369	1,029	2,412	4,495
NC Dependents	218	271	4,607	440	699	206
Mid-Coast						
Salmon River	297	1,165	3,680	332	1,054	450
Siletz River	4,495	7,660	19,496	2,216	3,015	5,202
Yaquina River	6,268	3,553	25,582	2,400	3,730	2,491
Beaver Creek	1,878	2,015	6,564	332	1,709	1,553
Alsea River	8,470	9,283	25,855	6,185	7,375	4,377
Siuslaw River	11,946	14,118	38,896	10,352	9,141	7,129
MC Dependents	492	1,929	1,890	856	464	1,646
Umpqua						
Lower Umpqua River	3,731	7,792	36,942	3,725	4,422	10,848
Middle Umpqua River	2,447	4,272	13,939	2,245	1,159	1,788
North Umpqua River	3,134	2,774	3,979	3,012	1,148	1,772
South Umpqua River	11,636	12,178	11,412	5,878	765	1,084
Lakes						
Siltcoos	3,945	3,797	7,178	1,558	2,421	715
Tahkenitch	5,675	3,413	3,691	1,085	1,249	269
Tenmile	9,302	6,449	11,141	2,086	4,374	318
Mid-South Coast						
Coos River	9,414	6,884	38,880	3,030	4,624	2,689
Coquille River	5,911	23,637	41,660	3,357	9,494	4,641
Floras Creek	2,502	1,936	1,022	1,585	942	693
Sixes River	34	567	410	168	120	69
MSC Dependents	48	32	105	0	0	0

APPENDIX C (SONCC COHO ESU)

Table C-1. Estimates of adult Coho Salmon run size in the Rogue River derived from Huntley Park seining and returns to Cole Rivers Hatchery, 1990 through 2016.

Year	Huntley Park seine		Cole Rivers Hatchery		Adult Coho Salmon run size			
	Fin-marks (<i>R</i>)	Total (<i>C</i>)	Adult returns	Adult fin- marks (<i>M</i>)	Total		Wild	
					Estimate	95% CI	Estimate	95% CI
1990	1	58	452	103	3,363	4,581	3,109	4,404
1991	11	106	2,209	277	2,729	1,455	471	604
1992	4	91	1,338	168	3,422	2,917	2,224	2,352
1993	3	34	756	106	1,033	953	383	580
1994	91	173	6,590	5,564	11,577	1,624	4,364	997
1995	139	211	8,714	7,757	12,923	1,248	3,359	636
1996	204	362	7,921	6,940	13,520	1,221	4,824	729
1997	213	424	8,001	7,571	16,541	1,562	7,760	1,070
1998	79	165	2,921	2,387	5,451	860	2,257	553
1999	108	163	4,381	3,742	6,194	673	1,389	319
2000	194	505	9,224	7,389	21,094	2,321	10,978	1,675
2001	352	848	12,759	9,837	26,028	2,075	12,015	1,410
2002	323	706	11,599	8,831	21,199	1,699	8,460	1,073
2003	169	449	6,656	4,842	14,101	1,672	6,805	1,162
2004	259	1,260	8,289	6,297	33,601	3,639	24,509	3,108
2005	146	519	4,876	3,930	15,296	2,094	9,957	1,690
2006	175	458	3,188	2,581	7,407	859	3,911	624
2007	87	345	2,085	1,713	7,411	1,337	5,136	1,113
2008	19	107	148	95	572	226	414	192
2009	12	80	503	449	3,084	1,536	2,566	1,401
2010	13	142	730	393	4,423	2,201	3,671	2,005
2011	25	172	1,086	778	5,702	2,020	4,545	1,804
2012	36	202	1,322	1,142	6,897	2,010	5,474	1,790
2013	17	154	1,911	1,394	13,209	5,737	11,210	5,285
2014	19	91	784	639	3,238	1,255	2,409	1,083
2015	16	65	1,540	1,332	5,692	2,331	4,072	1,972
2016	6	51	1,248	917	7,503	5,171	6,302	4,739
2017	22	147	836	764	5,412	2,033	4,526	1,859

APPENDIX D

Table D-1. Site status of 2017 GRTS samples in the Lower Columbia River Coho 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. Average is for 2012 to 2016.

Stratum	Population	Target response				Target non-response				Non-target			
		2017	Avg.	Min	Max	2017	Avg.	Min	Max	2017	Avg.	Min	Max
Coast	Youngs Bay	0	4	0	22	0	0	0	0	0	2	0	6
	Big Creek	0	2	0	10	0	0	0	1	0	0	0	0
	Clatskanie	11	20	13	23	16	5	0	13	1	2	1	3
	<i>Plympton</i>	1	2	2	2	0	0	0	0	0	0	0	0
	Scappoose	15	16	13	19	23	14	10	18	2	1	0	2
	Total	27	43	35	64	39	19	14	28	3	4	1	9
Cascade	Clackamas	15	22	16	30	18	17	11	23	0	1	0	2
	<i>Eagle Cr</i>	9	7	3	9	4	2	0	5	0	0	0	0
	Sandy	34	26	21	30	14	13	9	17	2	2	1	4
	Total	58	52	44	64	36	31	27	36	2	3	1	4
Gorge	Lower Gorge	0	3	1	6	6	3	2	3	0	0	0	1
	Hood	0	3	1	4	5	2	0	3	0	1	0	2
	Total	0	6	4	8	11	4	2	6	0	1	0	2
ESU Total		85	101	87	116	86	55	46	65	5	7	2	15

Table D-2. Site status of 2017 GRTS samples in the Oregon Coast Coho 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. Average is for 2012 to 2016.

Stratum	Population	Target response				Target non-response				Non-target			
		2017	Avg.	Min	Max	2017	Avg.	Min	Max	2017	Avg.	Min	Max
North Coast	Necanicum	17	16	11	21	5	6	1	11	1	3	1	5
	Nehalem	23	19	13	27	7	9	1	17	4	5	2	7
	Tillamook	19	21	14	27	7	9	3	13	4	9	0	20
	Nestucca	23	17	9	31	4	14	9	19	5	7	4	12
	NC Depend.	7	13	6	21	1	2	1	2	3	8	3	16
	Total	89	86	59	127	24	41	23	62	17	32	12	57
Mid-Coast	Salmon	7	11	7	17	14	14	8	22	0	3	0	7
	Siletz	25	20	12	29	2	11	3	20	9	5	2	9
	Yaquina	22	19	10	27	3	12	7	21	6	6	1	12
	Beaver	4	6	3	8	0	2	0	3	1	2	0	8
	Alsea	20	22	11	32	6	8	5	10	2	5	1	11
	Siuslaw	23	19	12	32	5	10	3	15	2	3	2	6
	MC Depend.	8	11	6	18	2	10	3	21	0	8	0	25
	Total	109	108	78	158	32	67	41	103	20	33	9	74
Lakes	Siltcoos	0	6	0	21	0	6	0	21	0	5	0	16
	Tahkenitch	0	1	0	5	0	1	0	6	0	3	0	8
	Tenmile	0	6	0	18	0	5	0	14	0	3	0	7
	Total	0	13	0	44	0	13	0	40	0	11	0	27
Umpqua	L. Umpqua	16	22	15	30	12	13	7	22	0	2	1	2
	M. Umpqua	15	16	6	22	17	19	11	29	4	3	1	6
	N. Umpqua	1	1	0	3	8	6	2	9	1	0	0	1
	S. Umpqua	15	19	9	30	13	16	8	23	3	6	1	13
	Total	47	58	30	84	50	54	33	70	8	10	3	21
Mid-South Coast	Coos	19	23	18	35	6	9	2	22	4	3	1	7
	Coquille	19	24	15	34	10	17	11	20	3	3	0	6
	Floras	11	11	1	22	19	17	6	24	4	3	1	6
	Sixes	12	10	3	19	2	10	6	16	0	1	0	2
	MS Depend.	0	3	2	3	16	10	4	18	7	5	2	9
	Total	61	71	41	109	53	62	48	77	18	14	5	26
ESU Total		306	336	229	522	159	236	168	350	63	100	33	193

* = Unusually low numbers of surveys meeting the standard inclusion criteria resulted in an inadequate sample for calculating abundance estimates. An alternative method was used including all surveys actually sampled, comprising both peak counts and AUC calculations.

Table D-3. Adult Coho Salmon counts, density (AUC/mile), and marked proportion information for valid GRTS surveys by population in the Lower Columbia River and Oregon Coast Coho ESUs during the 2017 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)	2017 Density	2012-16 Avg. Density	2017 % Marked	2012-16 Avg. % Marked
Lower Columbia River ESU							
<i>Coastal Stratum</i>							
Youngs Bay	0	--	--	--	4.4	--	48.2%
Big Creek	0	--	--	--	13.6	--	33.5%
Clatskanie River ^a	20	17.7	7 (158)	10.1	18.6	18.8%	4.7%
Plympton Creek	2	2.1	12	6.5	40.6	57.1%	77.7%
Scappoose Creek	18	14.7	30	6.9	11.8	2.5%	0.7%
<i>Cascade Stratum</i>							
Clackamas River ^a	16	14.4	5 (23)	2.0	7.1	19.7%	15.1%
Eagle Creek	3	3.6	9 (9)	17.4	16.8	88.8%	75.0%
Sandy River	30	25.5	24	14.9	18.2	0.0%	6.0%
<i>Gorge Stratum</i>							
Lower Gorge	6	2.6	14	90.6	65.9	--	30.4%
Hood River	2	2.6	8 (124)	40.0	141.0	--	58.4%
Oregon Coast ESU							
<i>North Coast Stratum</i>							
Necanicum River	17	10.9	4 (82)	8.7	34.5	4.7%	0.3%
Nehalem River	23	17.6	22	10.5	21.9	0.0%	1.2%
Tillamook Bay	19	16.5	5 (211)	14.6	35.4	0.0%	2.0%
Nestucca River	23	17.9	34	30.8	19.5	0.0%	0.7%
NC Dependents	7	4.4	0 (11)	4.5	32.2	0.0%	0.5%
<i>Mid-Coast Stratum</i>							
Salmon River	7	4.5	2 (39)	8.6	28.4	0.0%	3.4%
Siletz River	25	20.2	57	40.3	45.0	0.0%	0.1%
Yaquina River	22	13.4	29	21.9	62.7	3.4%	0.0%
Beaver Creek	4	2.1	8 (254)	121.5	184.5	0.4%	0.0%
Alsea River	20	14.7	26	18.1	44.5	0.0%	0.0%
Siuslaw River	23	13.9	7 (133)	10.3	28.1	0.0%	0.5%
MC Dependents	8	7.8	1 (47)	8.1	7.6	0.0%	1.8%
<i>Lakes Stratum</i>							
Siltcoos Lake	0	--	--	--	76.3	--	0.0%
Tahkenitch Lake	0	--	--	--	306.4	--	0.1%
Tenmile Lake	0	--	--	--	174.5	--	0.0%
<i>Mid-South Coast Str.</i>							
Coos Bay	19	16.1	13	12.3	52.2	0.0%	0.0%
Coquille River	19	15.7	18	16.6	55.8	0.0%	0.1%
Floras Creek	11	6.8	6 (62)	10.9	33.7	0.0%	0.0%
Sixes River	12	10.1	1 (14)	2.0	8.8	0.0%	0.0%
MS Dependents	0	0.0	0 (0)	0.0	1.7		0.9%
<i>Umpqua Stratum</i>							
Lower Umpqua	16	10.5	8 (117)	33.6	31.6	0.8%	0.2%
Middle Umpqua	15	11.8	6 (38)	4.8	12.0	0.0%	0.0%
North Umpqua	1	0.7	0 (0)	0.0	3.9	4.2%	2.7%
South Umpqua	15	10.9	2 (17)	1.7	13.7	5.3%	10.8%

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

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

Table D-4. Percent of selected GRTS sites classified “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 2015.

ESU	Strata	Population	No AUC				Denied				Inaccessible			
			2017	Avg.	Min.	Max.	2017	Avg.	Min.	Max.	2017	Avg.	Min.	Max.
LCR	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%
LCR	Coastal	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%
LCR	Coastal	Clatskanie River	37.9%	14.9%	0.0%	42.3%	6.9%	3.4%	0.0%	8.3%	0.0%	1.8%	0.0%	4.5%
LCR	Coastal	Scappoose Creek	4.3%	10.5%	3.4%	13.8%	15.2%	21.6%	10.3%	45.2%	0.0%	1.0%	0.0%	5.7%
LCR	Cascade	Clackamas River	9.7%	24.8%	9.5%	37.8%	12.5%	10.8%	2.9%	25.6%	4.2%	1.2%	0.0%	7.5%
LCR	Cascade	Sandy River	5.3%	9.1%	0.0%	28.2%	7.0%	1.4%	0.0%	5.1%	10.5%	10.4%	4.8%	21.4%
LCR	Gorge	Lower Gorge	0.0%	3.7%	0.0%	33.3%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
LCR	Gorge	Hood River	0.0%	0.0%	0.0%	0.0%	0.0%	3.7%	0.0%	16.7%	100.0%	5.3%	0.0%	33.3%
OC	N Coast	Necanicum River	0.0%	7.1%	0.0%	25.8%	4.3%	3.4%	0.0%	10.3%	13.0%	7.2%	0.0%	19.2%
OC	N Coast	Nehalem River	2.9%	25.9%	0.0%	66.7%	0.0%	1.2%	0.0%	5.1%	5.9%	2.7%	0.0%	5.6%
OC	N Coast	Tillamook Bay	0.0%	14.9%	0.0%	47.7%	13.3%	5.2%	2.0%	9.1%	10.0%	6.5%	0.0%	15.6%
OC	N Coast	Nestucca River	3.1%	23.0%	4.2%	41.9%	9.4%	7.1%	2.1%	12.5%	0.0%	5.8%	2.6%	10.4%
OC	N Coast	NC Dependents	0.0%	4.5%	0.0%	15.4%	9.1%	6.4%	2.6%	13.3%	0.0%	1.0%	0.0%	3.2%
OC	Mid-Coast	Salmon River	47.6%	18.4%	0.0%	37.5%	0.0%	7.0%	0.0%	11.5%	19.0%	17.4%	0.0%	31.0%
OC	Mid-Coast	Siletz River	2.1%	14.7%	4.1%	36.6%	0.0%	1.0%	0.0%	4.9%	2.1%	5.5%	2.1%	9.1%
OC	Mid-Coast	Yaquina River	0.0%	14.1%	0.0%	26.8%	6.5%	11.4%	6.9%	18.0%	3.2%	2.6%	0.0%	10.5%
OC	Mid-Coast	Beaver Creek	0.0%	14.6%	0.0%	35.7%	0.0%	6.0%	0.0%	16.7%	0.0%	0.0%	0.0%	0.0%
OC	Mid-Coast	Alsea River	0.0%	8.3%	0.0%	15.0%	10.3%	14.6%	8.5%	23.5%	6.9%	1.1%	0.0%	3.3%
OC	Mid-Coast	Siuslaw River	0.0%	18.4%	0.0%	51.3%	10.0%	6.5%	2.4%	13.3%	3.3%	6.1%	4.3%	9.5%
OC	Mid-Coast	MC Dependents	0.0%	14.4%	2.0%	21.8%	20.0%	10.9%	3.6%	22.2%	0.0%	2.6%	0.0%	6.1%
OC	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%
OC	Lakes	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%
OC	Lakes	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%
OC	Mid-S Coast	Coos Bay	6.9%	13.9%	0.0%	62.2%	13.8%	9.0%	4.7%	14.0%	0.0%	2.4%	0.0%	6.7%
OC	Mid-S Coast	Coquille River	0.0%	12.3%	0.0%	36.7%	21.9%	22.6%	14.8%	28.3%	9.4%	8.3%	1.9%	15.0%
OC	Mid-S Coast	Floras Creek	17.6%	23.1%	0.0%	51.9%	23.5%	26.6%	17.2%	31.3%	11.8%	4.1%	2.9%	6.3%
OC	Mid-S Coast	Sixes River	0.0%	29.1%	0.0%	63.2%	7.1%	17.0%	5.0%	26.3%	7.1%	7.3%	0.0%	11.8%
OC	Mid-S Coast	MS Dependents	13.0%	4.0%	0.0%	12.5%	52.2%	52.7%	40.9%	65.4%	4.3%	0.5%	0.0%	4.5%
OC	Umpqua	Lower Umpqua	14.3%	15.9%	7.4%	40.5%	7.1%	7.7%	2.4%	14.3%	10.7%	10.8%	7.1%	14.8%
OC	Umpqua	Middle Umpqua	19.4%	22.4%	7.7%	41.4%	16.7%	16.7%	7.7%	25.9%	5.6%	1.7%	0.0%	10.3%
OC	Umpqua	North Umpqua	20.0%	23.6%	0.0%	80.0%	40.0%	11.4%	0.0%	30.0%	0.0%	3.5%	0.0%	12.2%
OC	Umpqua	South Umpqua	9.7%	14.6%	0.0%	39.3%	25.8%	14.6%	8.5%	17.9%	6.5%	4.8%	0.0%	8.5%

