

THE OREGON PLAN *for* *Salmon and* *Watersheds*



**Western Oregon Adult Winter Steelhead and
Lamprey, 2024 Redd Survey Data Report**

Report Number: OPSW-ODFW-2024-09



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November 2024

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Citation: Neerman, A., J. Nott, E. Brown, B. Sounhein, M. Weeber and R. Emig. 2024. Western Oregon Adult Winter Steelhead and Lamprey, 2024 Redd Survey Data Report. Monitoring Program Report Number OPSW-ODFW-2024-09. Oregon Department of Fish and Wildlife, Salem, Oregon.

SUMMARY

This report provides a summary of results from Winter Steelhead spawning ground surveys conducted in Western Oregon basins in 2024. Also included is a summary of lamprey data collected from the same monitoring efforts. Total wild Winter Steelhead redd estimates in the Southwest Washington (SWW) Evolutionary Significant Unit (ESU) and in the Lower Columbia River (LCR) ESU (Oregon side only) was 66% and 103% of the 10-year average, respectively. Total wild Winter Steelhead redd estimates were 108% of the 10-year average for the Oregon Coast (OC) Distinct Population Segment (DPS). Estimate precision goals were met for Winter Steelhead redd estimates in the OC DPS, three of the four OC monitoring areas, the LCR ESU, and the Sandy River population. Precision goals were not met in the SWW ESU, the Clackamas River population, and the Mid South Coast monitoring area. Regional patterns are apparent for Winter Steelhead redd density, proportion of hatchery origin spawners, and spawn timing. Indices for Pacific Lamprey abundance were down in 2024 in both the Lower Columbia and the Oregon Coast.

INTRODUCTION AND METHODS

As part of the Oregon Plan for Salmon and Watersheds, the Oregon Department of Fish and Wildlife (ODFW) initiated a program in 2003 to monitor spawning Winter Steelhead (*Oncorhynchus mykiss*) in coastal Oregon streams; this program is part of the Oregon Adult Salmonid Inventory and Sampling project. The project is designed to assess yearly status and trend in abundance, proportion of hatchery origin spawners (pHOS), and distribution of Winter Steelhead spawners in four Oregon ESU/DPS units (Figure 1). The SWW and LCR ESU's are currently monitored at the population scale, though funding limited efforts to only the Clatskanie, Scappoose, Clackamas, and Sandy populations from 2014 to present. No monitoring has occurred in the Youngs Bay, Big Creek, Gorge, or Hood populations since 2013, except for the upper portions of the Lewis and Clark River (within Youngs Bay population) where an adult trap is operated, and survey calibration effort is monitored. In the OC DPS, status and trend are evaluated at the monitoring area scale. No monitoring occurred in the KMP DPS between 2016-2021, however monitoring resumed in 2022. Results for the KMP DPS are available in the Rogue-South Coast Multi-Species Conservation and Management Plan annual implementation reports (ODFW 2023).

A spatially balanced, probabilistic sampling design (Stevens 2002) was used to randomly select survey sites across a stream network of Winter Steelhead spawning habitat. Areas above dams or hatchery fish traps, where counts of Winter Steelhead are available, are not sampled. This includes River Mill (Clackamas River) and Winchester (North Umpqua River) dams, as well as Big Creek, Klaskanine, Sandy and Alsea hatcheries. In accordance with prior work (Susac and Jacobs 1999) conducted by ODFW in coastal streams, monitoring of Winter Steelhead abundance is based on counts of redds, and rearing origin is determined from fin-clip observations on live and dead fish. Repeat visits to each site are conducted, at least once every 14-days, from February through May to generate a total redd count for each survey. Post season, each site is evaluated to determine the number and timing of survey dates. Large gaps between survey dates (over 15 days), especially during the central period of Winter Steelhead spawning,

could result in undercounting of redds, thus sites with large gaps are not used in calculating abundance. Many of the random Winter Steelhead spawning sites are also sampled as salmon spawning sites; weekly surveys conducted from October through January. In these cases, survey data from December forward is included in the Winter Steelhead season dataset to ensure any Winter Steelhead (fish & redds) observed during the salmon spawning season are included in the Winter Steelhead season analysis. Pacific lamprey index sites and any Winter Steelhead sites that still have activity at the end of May are typically surveyed into June, or until the end of spawning activity. Specific descriptions of project protocols can be found in the annual survey procedures manual (ODFW 2024).

Winter Steelhead redd abundance estimates are converted to fish abundance using a standard redd-to-fish conversion factor developed in the OC ESU (ODFW 2013). Wild Winter Steelhead abundance estimates (including both dam counts and spawning survey results) for the 2024 spawning season are reported in Table 2.

Standard procedures for pHOS estimation require at least 10 fish with known adipose-fin-status (identified as clipped or not clipped). Preference is given to data from dead fish, though if the number of dead fish is less than 10, then live and dead fish samples are combined. If this still results in a sample of less than 10 fish, percent hatchery Winter Steelhead is calculated using a combination of current and previous year counts, methods varying slightly depending on monitoring unit.

Survey sites adjacent to hatcheries and/or their acclimation areas typically have a higher proportion of both hatchery fish and redd densities and can therefore bias estimates of wild abundance. To reduce bias and increase accuracy of Winter Steelhead estimates, a stratified approach was initiated in 2016. These efforts differ slightly between the various monitoring units. In the SWW ESU, the Clatskanie population is divided into two strata: Plympton Creek and the remaining Clatskanie basin. There are no hatchery Winter Steelhead releases in the Clatskanie population, but hatchery fish are abundant in Plympton Creek. For the LCR ESU, in each of the Sandy and Clackamas populations, strata are defined as: migration corridors, areas adjacent to hatchery releases, and the remaining portions of each population (i.e. areas outside of direct hatchery influence). In each case, individual strata estimates are calculated, then rolled up to final population estimates (Table 7). In the OC DPS, the ODFW Coastal Multi-Species Conservation and Management Plan allows for higher maximum pHOS rates in areas adjacent to acclimated hatchery release sites (ODFW 2014). These areas are known as hatchery “Hot-Spots”, subsequently referred to as hatchery hotspots (or simply, hotspots) in this report. Implementation of this stratification results in abundance and pHOS estimates for the areas of each MA that are outside of these hotspots. Estimates within the hotspots for 2024 are presented in Table 8 as a single estimate for the Oregon Coast DPS.

RESULTS

Survey Effort

SWW & LCR ESU's

- Survey effort in the SWW and LCR ESUs was similar to recent years (Table 1).
- The percentage of sites in the SWW ESU successfully surveyed (52.4%) was slightly below the 10-year average (57%). The percentage of successfully surveyed sites in the LCR ESU (59.5%) was above the 10-year average (50.9%).
- Due to ongoing budget constraints, surveys in the Young's Bay and Big Creek populations have not been conducted since 2013, and surveys in the Gorge and Hood populations have not been conducted since 2012.
- Budget limitations also resulted in a discontinuation of trapping at Bonnie Falls (Scappoose population) after the 2019 season. To address this, the area above the trap was included in spawning survey monitoring starting in 2021.
- Survey conditions in the SWW and LCR ESUs were challenging for much of the season. Access to higher elevation sites was diminished by winter weather and road conditions in February through May. Rainfall during the months of March and May led to some challenges in survey rotations in many areas. Temperatures were average for much of the season.

Oregon Coast DPS

- Survey effort in the OC DPS was comparable to recent years (Table 1). Additional surveys were conducted in the Siletz River Basin for district monitoring needs, however basin-scale results are not summarized in this report.
- Survey conditions in the OC DPS were challenging for much of the season. Snow early in the season limited access to sites in some areas, while heavy precipitation also challenged site access early and late in the season with heightened stream flows in both March and May (Figure 11). Despite this, the percentage of sites successfully surveyed (51.7%) was slightly above the 10-year average (50.8%).

Redd Abundance

SWW & LCR ESU's

- The 2024 wild Winter Steelhead redd abundance estimate in the SWW ESU (338 redds) was 66.2% of the 10-year average. OF the two populations monitored in the SWW ESU, 84% of the estimate comes from the Clatskanie population (Table 2).
- The 2024 wild Winter Steelhead redd abundance for the LCR ESU (3,060 redds) was slightly higher than the 10-year average of 2,967 redds (Table 2).

Oregon Coast DPS

- The 2024 wild Winter Steelhead redd abundance estimate in the OC DPS (52,210 redds) was 108% of the 10-year average (Table 2).

- Wild estimates were below the 10-year average in the Mid Coast and Mid-South Coast MAs (69% and 52%, respectively), while estimates in the North Coast and Umpqua MAs were well above the 10-year average (151% and 148%, respectfully) (Table 2).
- Within hatchery hotspots there were an estimated 540 wild Winter Steelhead redds, well below the prior 8-year average of 1,993 (Table 2). The estimate of wild redds in hotspots is 1.0% of the total OC DPS wild Winter Steelhead redd abundance estimate.

Hatchery Proportion

SWW & LCR ESU's

- In 2024, all populations had a sample size below the 10 live/dead fish-observation target. As a result, a cumulative of all prior year's pHOS was used. (Figure 5 & Table 9).
- Managers require information on the pHOS of Summer Steelhead (StS) in the Sandy and Clackamas populations, however no monitoring targeting this need exists. Winter Steelhead (StW) results are used as a proxy for StS pHOS, however a separate calculation for the common months of StS spawning (December -January) is triggered if StW pHOS is >5%.
- The 2024 pHOS estimate for the Sandy Population did not exceed 5%. The pHOS estimate for spawning ground surveys in the Clackamas population was 23.7%, requiring a calculation of February Summer Steelhead pHOS which was 0% for 2024.

Oregon Coast DPS

- In the OC DPS, pHOS in 2024 was estimated to be 7.3% and below the 10-year average (Table 2).
- Estimates of pHOS were well below the prior 10-year average in North Coast and Umpqua MAs and above the prior 10-year average in the Mid Coast and Mid-South Coast MAs (Table 2).
- The North Coast and Umpqua MAs had pHOS estimates of 0% (Table 2).
- All four MAs had a sample size above the 10 live/dead fish-observation target (Figure 9).
- The 2024 pHOS estimate for hatchery hotspots was 84.7%. This is more than double the prior 8-year average of 41.3% (Table 2).

Distribution and Timing

SWW & LCR ESU's

- Site occupancy (percentage of sites with at least one Winter Steelhead redd) was below the 10-year average in the SWW, but was slightly above the 10-year average in the LCR ESU. Occupancy in the Clackamas population (54%) was above the prior 10-year average, but the occupancy rate of 73% in the Sandy population was slightly lower than average (Table 3).
- Winter Steelhead redd timing in the Clatskanie population was roughly normal, peaking in mid-March. There were a small number of steelhead redds observed in early June while conducting lamprey surveys, which is later than redds are typically observed in this

population. Redd timing in the LCR was consistent with average patterns (mid-March to early-April peak). (Figure 6).

Oregon Coast DPS

- The percentage of occupied sites in the OC DPS was above the 10-year average. The North Coast and Umpqua MAs were both well above average, whereas the Mid Coast MA was average and the Mid South Coast MA was slightly below average. The Umpqua MA recorded a 90% occupancy rate, which is the highest rate on record for the Umpqua MA (Table 3).
- Winter Steelhead spawn timing was fairly typical for each of the Oregon Coast MAs in 2024 (Figure 10).

Pacific Lamprey Information

SWW & LCR ESU's

- For the second year in a row Pacific Lamprey redd densities (peak redds per mile) were the lowest since 2012 in the LCR and SWW ESUs (Figure 12). Spawn timing, as expected, coincided with increasing water temperatures during May and early June (Figure 13).
- Site occupancy was lower than the 12-year average in the LCR and SWW ESUs, though 9% higher than in 2023 (Figure 12).

Oregon Coast DPS

- In the Oregon Coast, Pacific Lamprey occupied 27.0% of Winter Steelhead surveys, just 67% of the 21-year average. Redd density (peak redds per mile) was only 48.8% of the 21-year average (Figure 14).
- Within Pacific Lamprey index surveys on the Oregon Coast, 2024 spawn timing tracked the 5-year average. Heavy precipitation in early-May led to stream flows that were much higher and cooler than typical and may have delayed spawning (Figure 15).
- Pacific Lamprey redd counts continue to track occupancy metrics in the OC DPS random sites. These results suggest that occupancy may provide an index of abundance (Figure 14).

REFERENCES

- Busby, P.J., T.C. Wainwright, G.J. Bryant, L.J. Lierheimer, R.S. Waples, F.W. Waknitz and I.V. Lagomarsino. 1996. Status review of West Coast steelhead from Washington, Idaho, Oregon and California. U.S. Department of Commerce, NOAA Technical Memorandum, NMFS-NWFSC-27.
- Myers, J., C. Busack, D. Rawding, A. Marshall, D. Teel, D.M. Van Doornik, and M.T. Maher. 2006. Historical Population structure of Pacific salmonids in the Willamette River and lower Columbia River basins. U.S Dept. of Commerce, NOAA Tech Memo. NMFS-NWFSC-73, 311 p.
- ODFW. 2005. 2005 Oregon native fish status report. Oregon Department of Fish and Wildlife, Salem, Oregon.
Available: http://www.dfw.state.or.us/fish/CRP/native_fish_status_report.asp
- ODFW. 2013. Winter Steelhead Redd to Fish Conversion, Spawning Ground Survey Data. Oregon Department of Fish and Wildlife, Salem, Oregon.
Available: <http://oregonstate.edu/dept/ODFW/spawn/reports.htm>
- ODFW. 2014. Coastal Multi-Species Conservation and Management Plan. Oregon Department of Fish and Wildlife, Salem, Oregon.
Available: http://www.dfw.state.or.us/fish/CRP/coastal_multispecies.asp
- ODFW. 2024. Winter Steelhead Spawning Survey Procedures Manual, 2024. Oregon Department of Fish and Wildlife, Salem, Oregon.
Available: <https://odfw.forestry.oregonstate.edu/spawn/reports.htm>
- ODFW, 2023. Rogue–South Coast Multi-Species Conservation and Management Plan annual implementation reports. Oregon Department of Fish and Wildlife, Salem, Oregon.
Available: https://www.dfw.state.or.us/fish/CRP/rogue_south_coast_multi-species_conservation%20and%20Management_plan.asp
- Stevens, D.L. 2002. Sampling design and statistical analysis methods for integrated biological and physical monitoring of Oregon streams. OPSW-ODFW-2002-07, Oregon Department of Fish and Wildlife, Salem, Oregon.
- Susac, G.L. and S.E. Jacobs. 1999. Evaluation of spawning ground surveys for indexing the abundance of adult Winter Steelhead in Oregon coastal basins. Annual Progress Report, Oregon Department of Fish and Wildlife, Salem, Oregon.

TABLES & FIGURES

Table 1. Oregon Winter Steelhead site status by monitoring area or population, 2024. Target sites were within, and non-target sites were outside of Winter Steelhead spawning habitat. Response sites were successfully surveyed. Non-response sites were not successfully surveyed because of issues such as: lack of landowner permission, site inaccessibility, or gaps in survey effort typically due to stream turbidity. *ns* = no surveys conducted.

ESU/DPS	Population or Monitoring Area	Target Response	Target Non-response	Non-target
Southwest Washington	Youngs Bay	ns	ns	ns
	Big Cr	ns	ns	ns
	Clatskanie ^b	23	5	0
	Scappoose	10	25	0
	Total	33	30	0
Lower Columbia River	Clackamas ^b	36	18	2
	Sandy ^b	39	29	2
	Gorge	ns	ns	ns
	Total	75	47	4
Oregon Coast ^a	North Coast	32	19	3
	Mid Coast	74	26	15
	Mid-South Coast	22	50	4
	Umpqua	41	38	3
	Total	169	133	25

a = Oregon Coast DPS does not include sites that were within hatchery hotspots.

b = Surveys in the Clatskanie, Clackamas and the Sandy River basin are shown here as the sum of all components.

Table 2. Western Oregon wild Winter Steelhead spawning abundance (redds and fish) and percent hatchery origin spawners (pHOS), 2024. Includes results from spawning ground surveys (SGS) and counting stations (areas without SGS). Wild proportions and pHOS estimates are derived from fin-mark observations on live and dead Winter Steelhead. *ns* = no surveys conducted.

ESU/DPS	Population or Monitoring Area	Data Source	Wild Winter Steelhead				pHOS	
			Redds		Fish		10-Yr	
			2024	10-Yr Avg	2024	10-Yr Avg	2024	10-Yr Avg
Southwest Washington	Youngs Bay	SGS	ns	ns	ns	ns	ns	ns
	Big Cr	SGS	ns	ns	ns	ns	ns	ns
	Clatskanie	SGS	284	473	487	808	0.0%	3.4%
	Scappoose	SGS	54	37	96	67	0.0%	0.0%
	Total ^a	All	338	511	583	875	0.0%	3.0%
Lower Columbia River	Clackamas	SGS	523	670	893	1,142	23.7%	16.3%
	N Fk Clackamas Dam	Count	-	-	3,282	1,307	-	0.0%
	Sandy	SGS	2,537	2,297	4,317	3,909	4.3%	4.4%
	Gorge	SGS	ns	ns	ns	ns	ns	ns
	Total	All	3,060	2,967	8,492	6,357	5.2%	5.1%
Oregon Coast	North Coast	SGS	22,458	14,833	38,182	25,220	0.0%	9.6%
	Mid Coast	SGS	9,249	13,357	15,727	22,710	23.4%	12.9%
	Alsea Hatchery	Count	-	-	98	70	0.0%	0.0%
	Mid-South Coast	SGS	4,906	9,525	8,344	16,195	26.9%	16.7%
	Umpqua	SGS	15,597	10,565	26,519	17,964	0.0%	3.1%
	Winchester Dam	Count	-	-	12,041	8,764	0.3%	5.3%
	Total	All	52,210	48,280	100,911	90,924	7.3%	9.9%
<i>Hatchery Hot-Spots ^b</i>	<i>SGS</i>	540	1,993	922	3,391	84.7%	41.3%	

a = Some populations in DPS are not currently monitored, and the resulting total is incomplete.

b = Surveying of hatchery hotspots began with the 2016 season, average is 2016-2023.

Table 3. Oregon Winter Steelhead redd density and site occupancy, 2024. Sites must have at least one confirmed redd to be considered occupied. *ns* = *no surveys conducted*.

ESU/DPS	Population or Monitoring Area	Redds / Mile		% Sites With Redds	
		2024	10-Yr Avg	2024	10-Yr Avg
Southwest Washington	Young's Bay	ns	ns	ns	ns
	Big Creek	ns	ns	ns	ns
	Clatskanie	4.6	8.4	46%	62%
	Scappoose	0.7	0.8	13%	18%
	Total	2.4	4.9	28%	39%
Lower Columbia River	Clackamas	3.5	4.4	54%	48%
	Sandy Gorge	16.0	15.3	73%	78%
		ns	ns	ns	ns
	Total	9.2	9.5	63%	61%
Oregon Coast	North Coast	17.4	13.9	78%	66%
	Mid Coast	7.1	9.6	69%	69%
	Mid-South Coast	6.7	11.8	73%	78%
	Umpqua	8.9	6.5	90%	69%
	Total	10.2	10.0	78%	70%
	<i>Hatchery Hot-Spots^a</i>	<i>17.7</i>	<i>16.6</i>	<i>78%</i>	<i>75%</i>

a = Surveying of hatchery hotspots began with the 2016 season, average is 2016-2023.

Table 4. Annual fish abundance estimates of naturally spawning wild Winter Steelhead by Monitoring Area (MA) in the Oregon Coast Winter Steelhead DPS, run years 2003 to 2024. Includes estimates for areas above counting stations where GRTS surveys are not conducted. n.a. = not available.

Year	Oregon Coast DPS				
	North Coast	Mid Coast	Mid- South Coast	Umpqua	Hatchery Hot-Spots ^a
2003	48,838	30,760	20,154	52,754	n.a.
2004	48,622	23,877	17,335	33,159	n.a.
2005	32,516	13,417	38,884	24,762	n.a.
2006	35,814	22,947	33,239	21,247	n.a.
2007	35,010	17,230	41,334	32,011	n.a.
2008	20,164	21,471	31,974	35,490	n.a.
2009	17,740	20,540	15,535	23,423	n.a.
2010	32,181	28,367	33,880	37,702	n.a.
2011	16,937	32,894	16,161	28,563	n.a.
2012	26,973	32,430	12,608	32,302	n.a.
2013	49,934	47,480	26,223	48,847	n.a.
2014	24,118	15,324	18,495	26,496	n.a.
2015	41,893	26,347	19,635	29,513	n.a.
2016	26,338	40,484	23,887	28,893	2,938
2017	18,228	9,443	11,749	20,790	2,554
2018	15,481	32,371	18,503	35,495	810
2019	13,410	24,181	9,179	29,704	4,437
2020	33,611	27,640	20,909	27,612	7,994
2021	23,380	12,341	12,373	19,803	4,351
2022	17,612	19,187	14,977	27,245	2,113
2023	38,133	20,411	12,247	21,727	1,931
2024	38,182	15,825	8,344	38,560	922

a = Stratification of hatchery hotspots began in 2016 per guidance in CMP (ODFW 2014). Oregon Coast MAs do not include sites that were within hatchery hotspots after 2015.

Table 5. Annual fish abundance estimates of naturally spawning wild Winter Steelhead by Population in the Lower Columbia Winter Steelhead ESUs, run years 2003 to 2024. n.a. = not available. TBD = Random surveys predate the current effort, and the data has not yet been included in this analysis.

Year	Southwest Washington ESU				Lower Columbia ESU	
	Youngs Bay	Big Creek	Clatskanie	Scappoose	Clackamas	Sandy
2003	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
2004	TBD	TBD	TBD	TBD	TBD	TBD
2005	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
2006	n.a.	n.a.	n.a.	n.a.	1,164	1,060
2007	n.a.	n.a.	n.a.	n.a.	1,208	1,140
2008	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
2009	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
2010	n.a.	n.a.	n.a.	n.a.	n.a.	TBD
2011	n.a.	n.a.	n.a.	n.a.	n.a.	TBD
2012 ^a	340	54	415	171	2,733	357
2013	164	53	1,530	375	2,427	3,509
2014	n.a.	n.a.	n.a.	n.a.	3,404	3,249
2015	n.a.	n.a.	1,950	198	3,740	4,670
2016	n.a.	n.a.	827	178	4,144	5,488
2017	n.a.	n.a.	293	35	2,531	2,125
2018	n.a.	n.a.	371	24	3,030	5,981
2019	n.a.	n.a.	422	5	1,500	1,896
2020	n.a.	n.a.	1,403	118	2,005	2,634
2021	n.a.	n.a.	328	n.a.	990	3,868
2022	n.a.	n.a.	815	34	1,566	4,388
2023	n.a.	n.a.	854	0	1,277	4,789
2024	n.a.	n.a.	487	96	4,175	4,317

a = Current GRTS sampling effort began with the 2012 spawning season.

Table 6. Oregon Winter Steelhead redd abundance estimates, 2024. Estimates do not include areas above counting stations and are thus not complete population estimates in some areas. Estimates without a 95% Confidence Interval (CI) are based on alternative methods due to inadequate samples. ns = no surveys conducted.

ESU/DPS	Population or Monitoring Area	Winter Steelhead Redd Abundance			
		<u>Total</u>		<u>Wild</u>	
		Estimate	95% CI	Estimate	95% CI
Southwest Washington	Youngs Bay	ns	ns	ns	ns
	Big Cr	ns	ns	ns	ns
	Clatskanie ^a	288	139	284	-
	Scappoose	54	98	54	-
	Total	342	170	338	-
Lower Columbia River	Clackamas ^a	686	328	523	-
	Sandy ^a	2,651	589	2,537	-
	Gorge	ns	ns	ns	ns
	Total	3,337	674	3,060	-
Oregon Coast ^b	North Coast	22,458	6,664	22,458	6,664
	Mid Coast	12,089	3,135	9,249	2,411
	Mid-South Coast	6,714	2,417	4,906	1,766
	Umpqua	15,597	3,191	15,597	3,191
	Total	56,858	8,596	52,750	7,975

a = Estimates are derived from stratified samples. See intro/method section for stratification overview.

b = Oregon Coast DPS does not include sites that were within hatchery hotspots.

Table 7. Oregon Winter Steelhead redd abundance estimates within stratified samples, 2024. Estimates without a 95% CI are based on alternative methods due to insufficient sample size. ns = no surveys conducted.

ESU	Population and <i>Strata</i>	Survey Effort		Approximate Spawning Miles	Winter Steelhead Redd Abundance			
		Number of Surveys	Miles		Total		Wild	
					Estimate	95% CI	Estimate	95% CI
Southwest Washington	<i>Clatskanie Strata</i>	19	17.6	57.0	278	-	274	-
	<i>Plympton Cr. Strata</i>	1	1.0	1.1	10	-	10	-
	Clatskanie Total	20	18.6	58.1	288	-	284	-
Lower Columbia River	<i>Clackamas Strata</i>	25	23.7	139.5	465	-	395	-
	<i>Clackamas Migration Strata</i>	9	13.5	31.5	107	-	78	-
	<i>Eagle Cr. Hatchery</i>	2	2.4	9.5	113	-	50	-
	Lower Clackamas Total	36	39.6	180.5	686	-	523	-
	<i>Sandy Strata</i>	28	30.5	133.6	2,421	-	2,348	580
	<i>Sandy Migration Strata</i>	11	20.4	22.0	230	-	189	-
	<i>Cedar Cr. Hatchery Strata</i>	ns	ns	ns	ns	ns	ns	ns
	Sandy Total	39	50.9	155.6	2,651	-	2,537	-
Lower Columbia ESU Total		75	90.5	336.1	3,337	-	3,060	-

Table 8. Oregon Winter Steelhead redd abundance estimates within Oregon Coast Hotspots in 2024. Estimates are calculated at the DPS scale, due to insufficient sample size at the MA scale. Estimates without a 95% CI are based on alternative methods due to inadequate samples.

DPS	Monitoring Area	Survey Effort		Spawning Miles within Hotspots	Winter Steelhead Redd Abundance			
		Number of Surveys	Miles		Total		Wild	
					Estimate	95% CI	Estimate	95% CI
Oregon Coast	North Coast Hotspots	3	2.1	49	3,550	1,904	540	290
	Mid Coast Hotspots	4	3.6	89				
	Mid-South Hotspots	3	1.9	61				
	Umpqua Hotspots	0	0.0	42				
	Total	10	7.5	241				

Table 9. The number of known adipose fin-mark status dead and live Winter Steelhead observed on spawning grounds, 2024. Calculation of pHOS based on a minimum sample size of 10. Preference order: 1-current year dead fish; 2-current year combined dead and live fish; 3-recent years combined sample. ns = no surveys conducted.

ESU/DPS	Population/Sub-Pop. or Monitoring Area	Number Dead Fish		Number Live Fish	
		2024	10-Yr Avg	2024	10-Yr Avg
Southwest Washington	Young's Bay	ns	ns	ns	ns
	Big Cr	ns	ns	ns	ns
	Clatskanie	1	1	9	17
	<i>Clatskanie Exc. A</i>	1	0	5	7
	<i>A. Plympton Creek</i>	0	1	4	9
	Scappoose	0	0	4	0
	Total	1	1	13	17
Lower Columbia River	Clackamas Population ^a	1	3	0	12
	<i>Clackamas Exc. A & B</i>	1	0	0	3
	<i>A. Migration Corridor</i>	0	1	0	2
	<i>B. Eagle Creek</i>	0	2	0	8
	Sandy Population	2	4	5	51
	<i>Sandy Exc. A & B</i>	0	1	4	14
	<i>A. Migration Corridor</i>	2	2	1	7
	<i>B. Cedar Creek</i>	ns	4	ns	52
	Gorge	ns	ns	ns	ns
Total	3	7	5	63	
Oregon Coast	North Coast	3	4	71	67
	Mid Coast	5	3	131	41
	Mid-South Coast	0	1	26	50
	Umpqua	0	1	16	28
	Total ^b	8	9	244	199
<i>Hatchery Hot-Spots</i>		3	0	43	20

a = Area below North Fork Clackamas Dam.

b = Oregon Coast DPS total does not include sites that were within hatchery hotspots.

Table 10. Annual estimates of Winter Steelhead per redd based on calibration survey areas, run years 2014 to 2024. n.a. = not available. Currently used conversion formula:

$$\text{Total Winter Steelhead} = (1.70 * \text{Redds}) + 3.74 \text{ (ODFW 2013).}$$

Year	SWW ESU	Oregon Coast DPS				Annual Average
	Lewis & Clark River	N. Fk. Nehalem River	E. Fk. of S. Fk. Trask River	Fall Cr. (Alsea R.)	Mill Cr. (Yaquina R.)	
2014	2.08	n.a.	3.45	1.27	1.79	2.15
2015	1.06	n.a.	2.19	1.55	2.00	1.70
2016	1.23	1.98	1.21	0.49	1.02	1.19
2017	0.86	n.a.	n.a.	n.a.	2.69	1.78
2018	1.23	n.a.	n.a.	n.a.	0.76	0.99
2019	1.28	n.a.	n.a.	n.a.	1.11	1.19
2020	1.07	n.a.	n.a.	n.a.	0.93	1.00
2021	0.48	n.a.	n.a.	n.a.	1.94	1.21
2022	0.79	n.a.	n.a.	n.a.	n.a.	0.79
2023	0.94	n.a.	n.a.	n.a.	1.94	1.44
2024	1.04	n.a.	n.a.	n.a.	1.86	1.45
Avg.	1.09	1.98	2.28	1.10	1.60	1.35

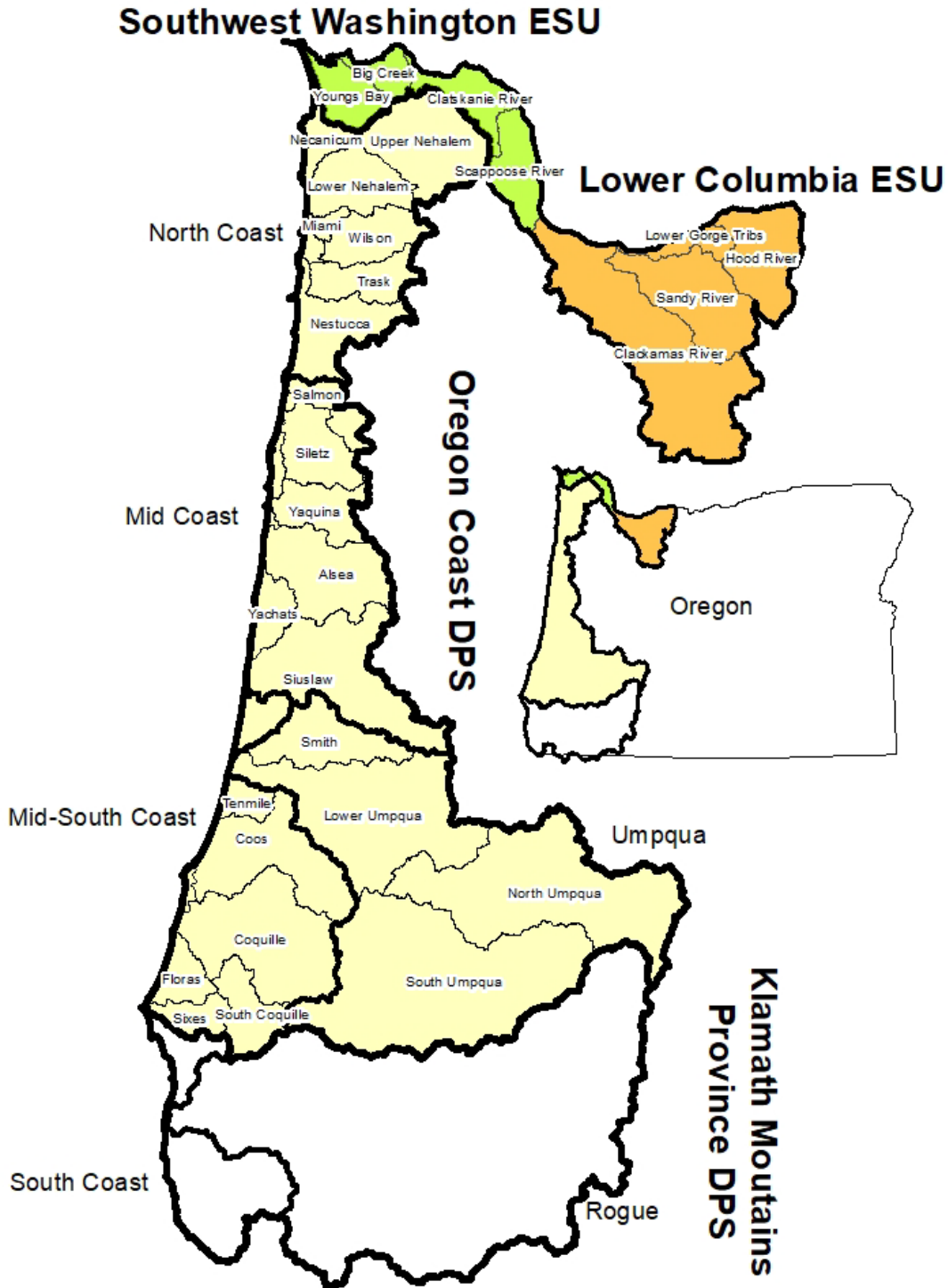


Figure 1. Geographic scope of Winter Steelhead monitoring, 2024. Monitoring scales include Evolutionary Significant Unit (ESU), Dependent Population Segment (DPS), Monitoring Area (MA), and population. Areas without color shading were not surveyed in 2024. Boundaries as defined by Busby et.al. (1996) for ESU/DPS, by Myers et al. (2006) for the LCR ESU populations, by the 2005 Oregon Native Fish Status Report (ODFW 2005) for other populations.

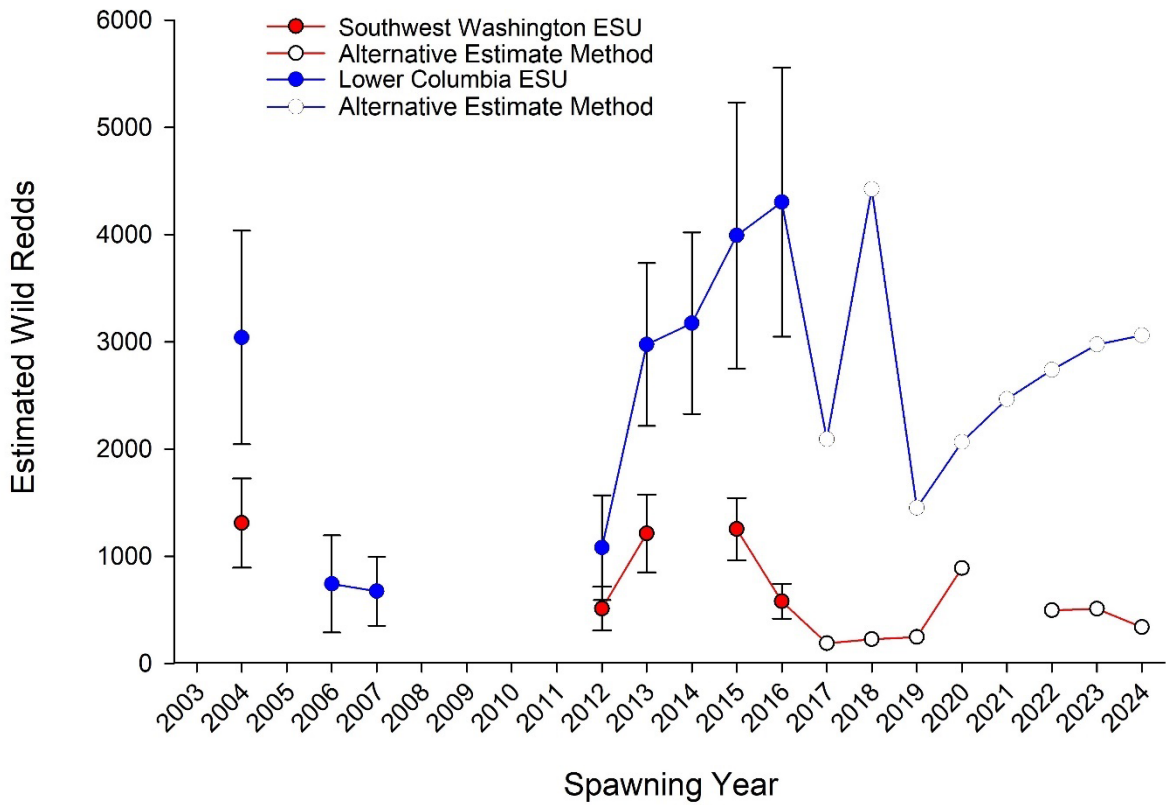


Figure 2. Wild Winter Steelhead redd estimates in the Oregon portions of the SWW and LCR ESUs based on random surveys, 2004 to 2024. Error bars represent 95% confidence intervals. Inclusion of survey data from specific populations has varied across years. It should be noted, 2017 to 2024 error bars are not present because estimates were calculated with alternative methods. Additionally, an estimate at the strata level for the SWW ESU was not available for 2021 due to an insufficient sample size for an estimate in the Scappoose population.

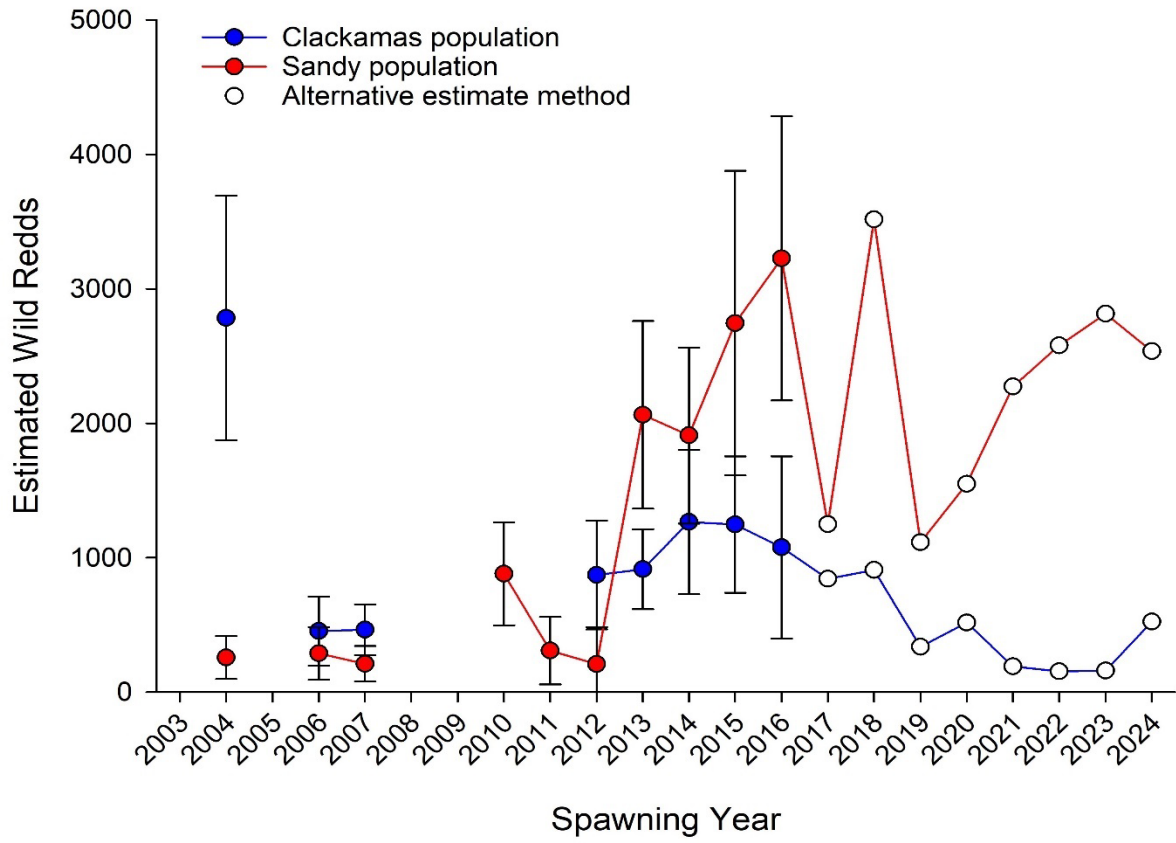


Figure 3. Wild Winter Steelhead redd estimates in the Clackamas and Sandy River populations based on random surveys, 2004 to 2024. Error bars represent 95% confidence intervals. Note: 2017 to 2024 error bars are not present because estimates were calculated with alternative methods.

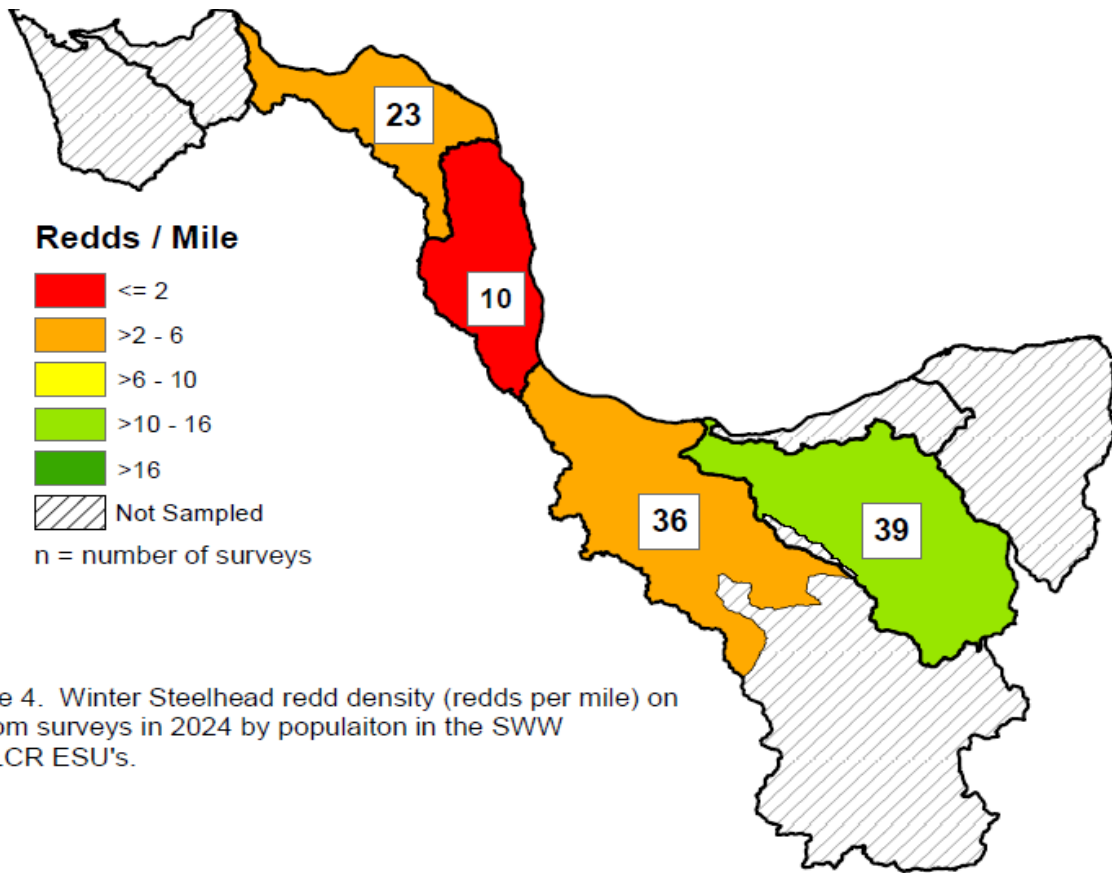


Figure 4. Winter Steelhead redd density (redds per mile) on random surveys in 2024 by population in the SWW and LCR ESU's.

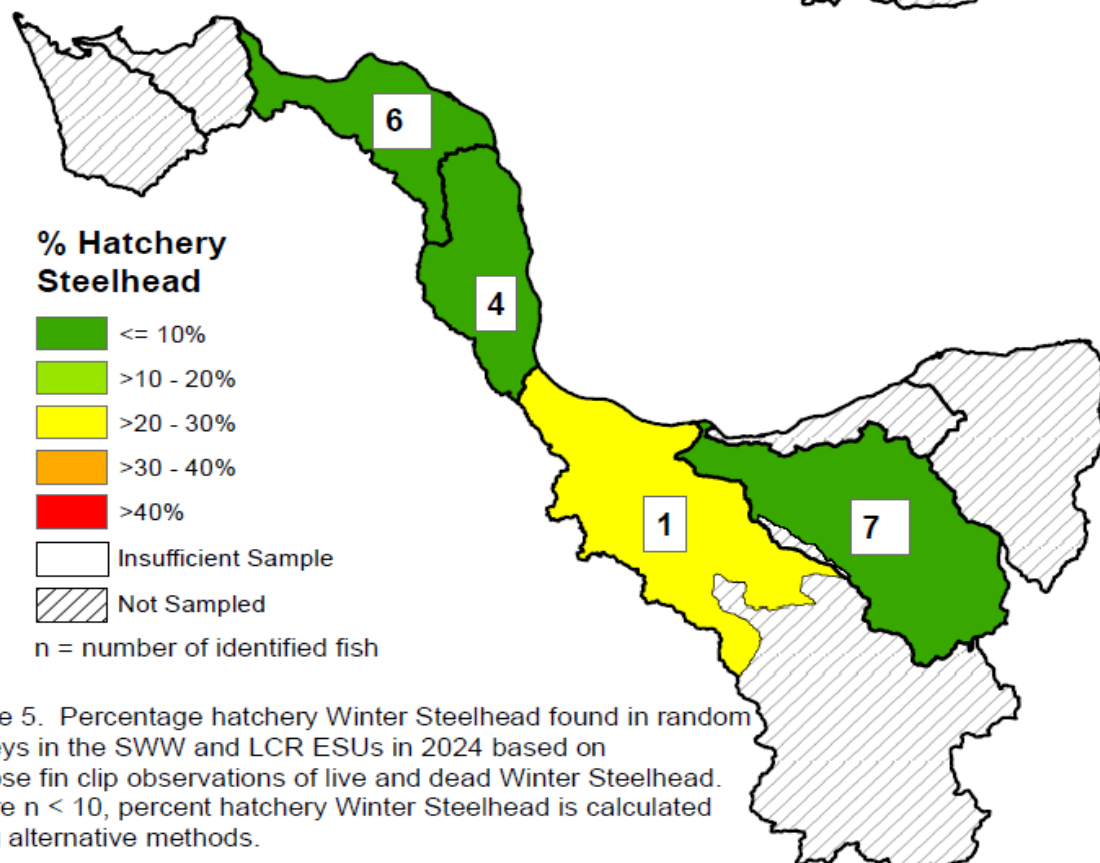


Figure 5. Percentage hatchery Winter Steelhead found in random surveys in the SWW and LCR ESU's in 2024 based on adipose fin clip observations of live and dead Winter Steelhead. Where $n < 10$, percent hatchery Winter Steelhead is calculated using alternative methods.

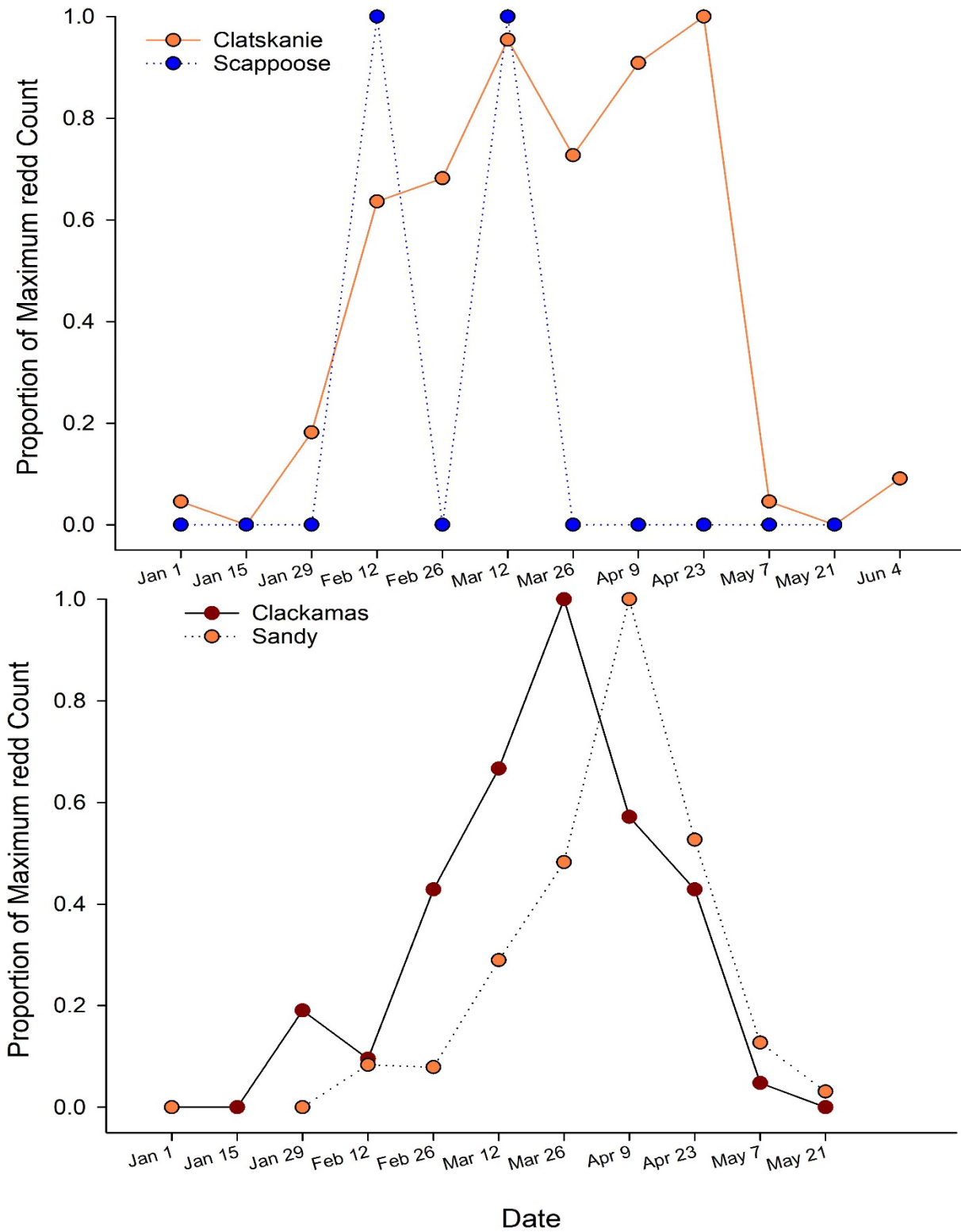


Figure 6. Winter Steelhead spawn timing, represented by proportion of the maximum redd count in a) SWW ESU populations and b) LCR ESU populations, 2024.

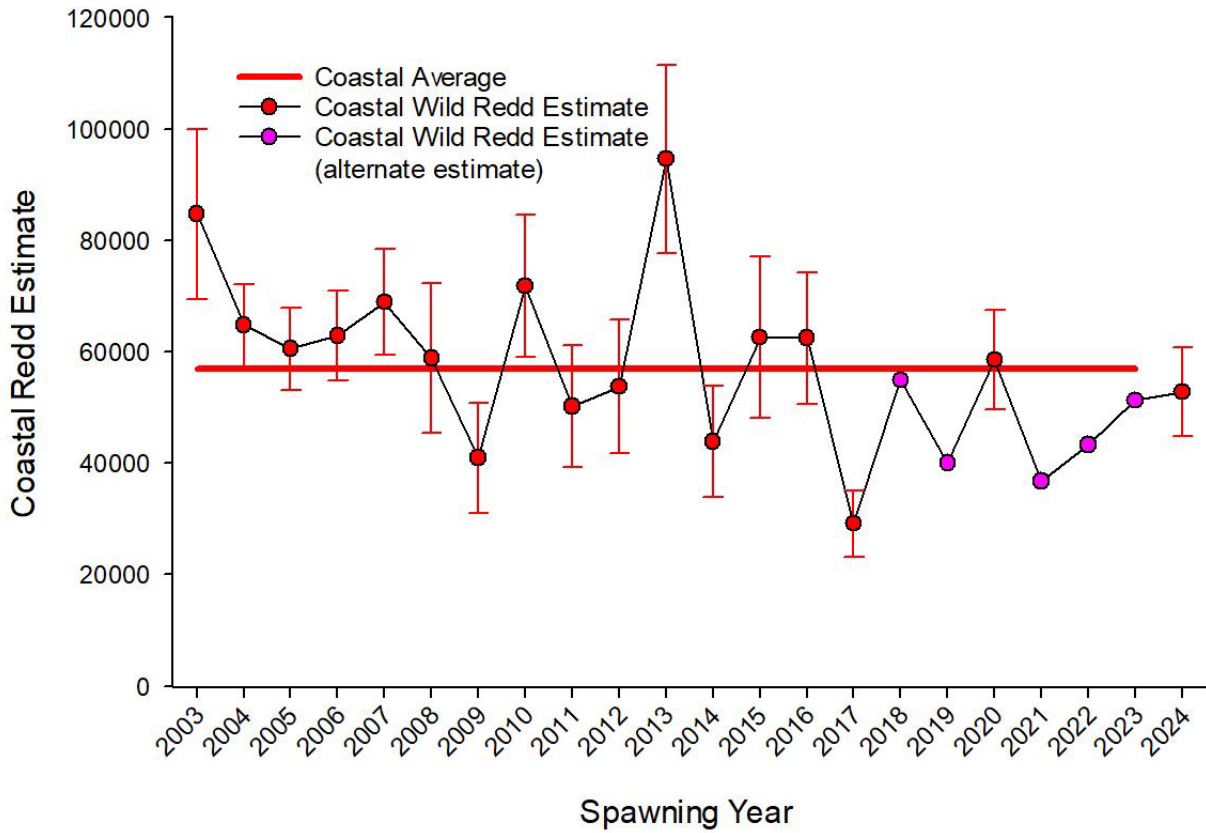


Figure 7. Estimated number of wild Winter Steelhead redds in the Oregon Coast DPS, 2003 to 2024. Error bars represent 95% confidence intervals. Note: 2018, 2019, and 2021-2023 error bars are not present because estimates were calculated with alternative methods.

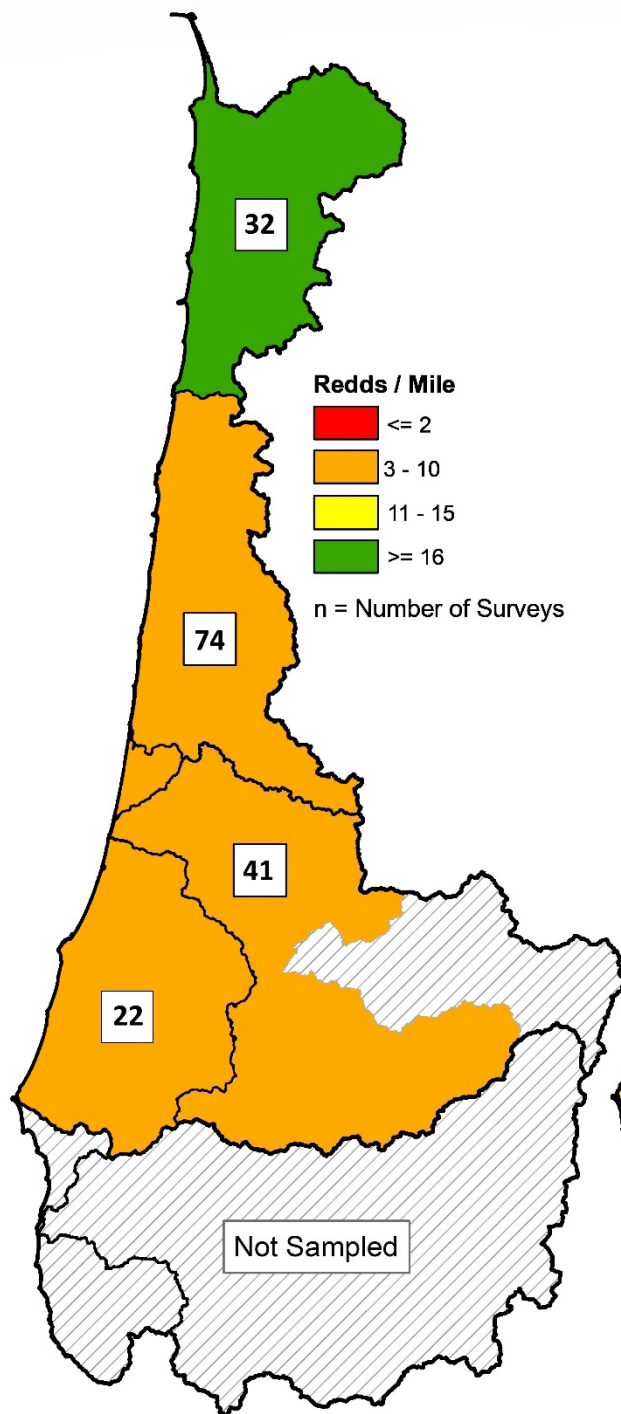


Figure 8. Steelhead redd density (redds per mile) in random surveys in 2024 by monitoring area in the Coastal and KMP DPS's.

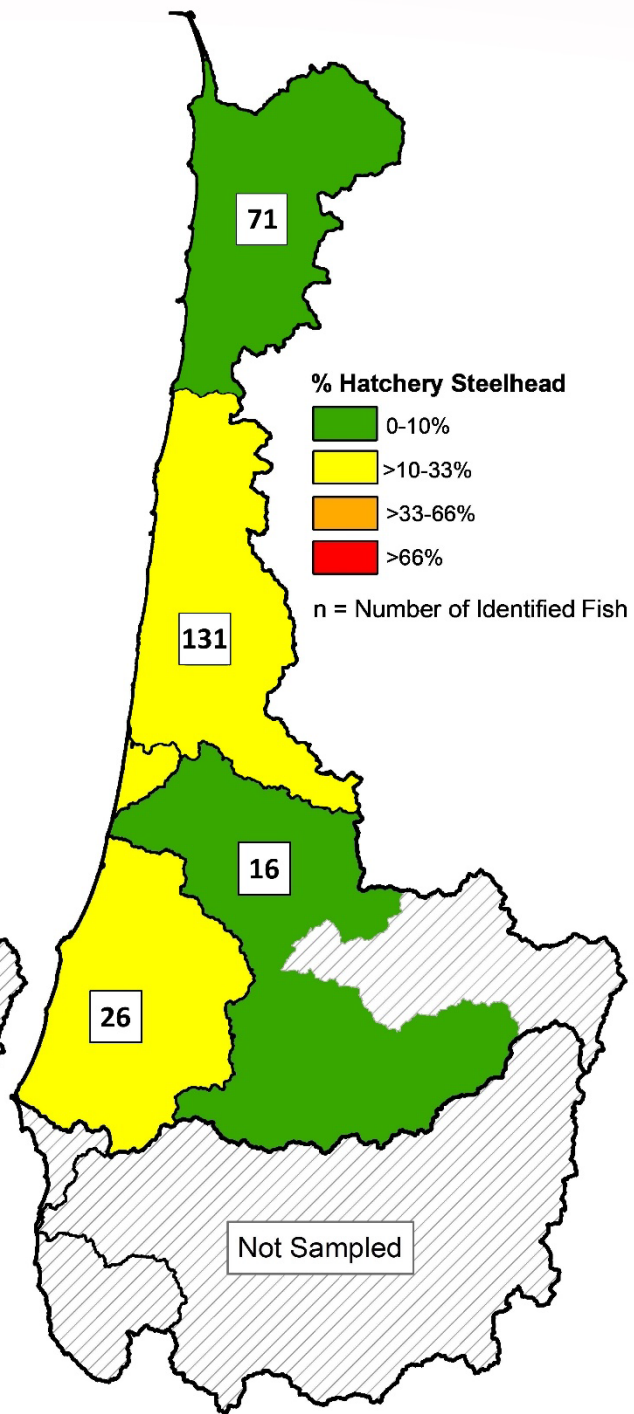


Figure 9. Percentage hatchery steelhead found in random surveys in each of the six Coastal and KMP monitoring areas in 2024 based on fin clip observations of live and dead steelhead.

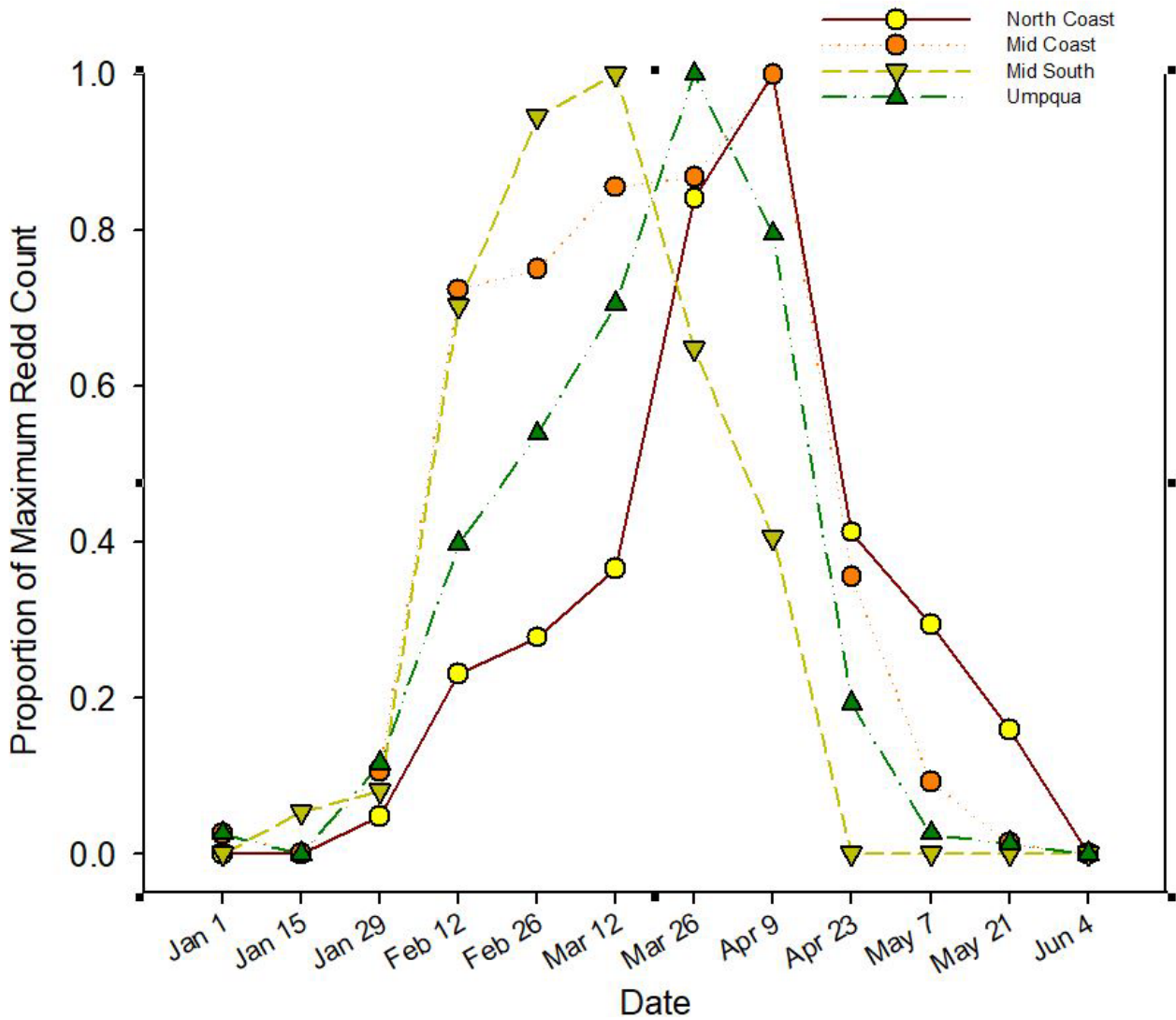


Figure 10. Winter Steelhead spawn timing, represented by proportion of the maximum redd count in each of the four Oregon Coast DPS monitoring areas, 2024.

Oregon Coast Stream Gages

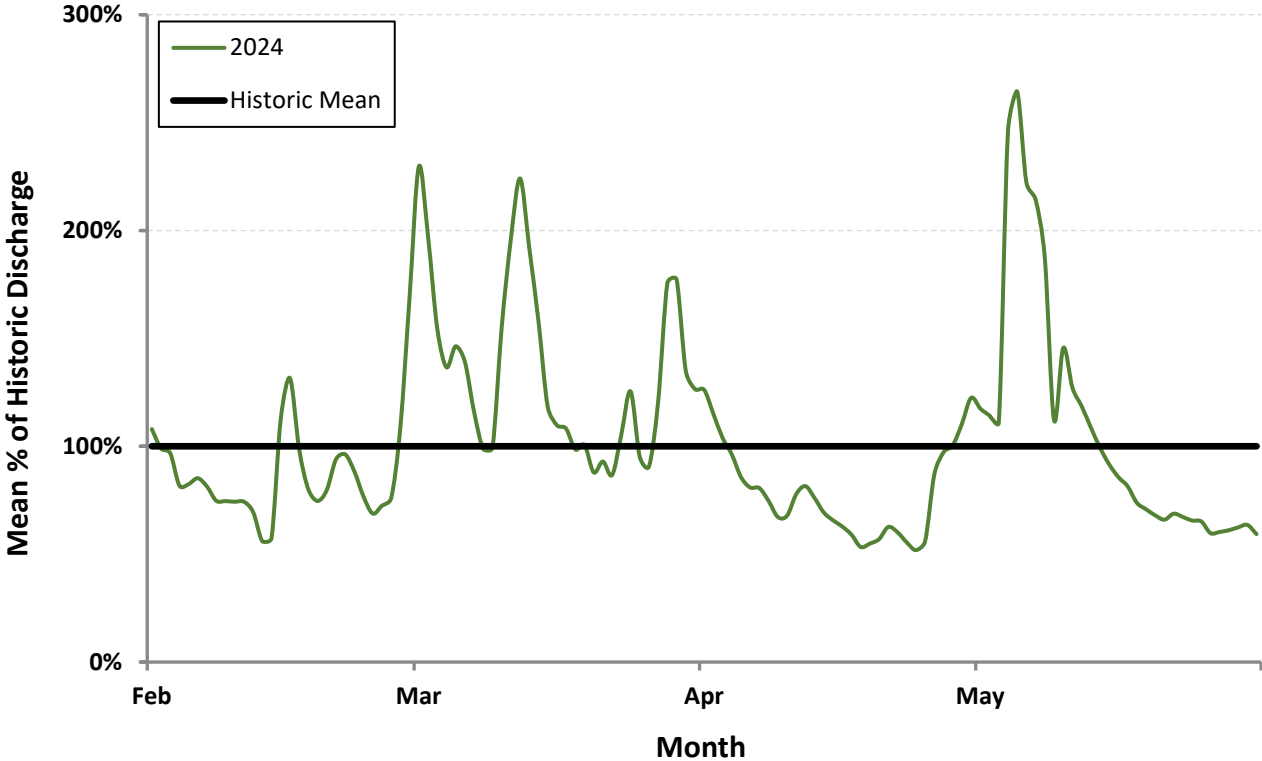


Figure 11. Mean discharge at Oregon Coast stream gages in 2024, presented as percentage of historic mean discharge (years of history varies by stream gage).



Figure 12. Lower Columbia Pacific Lamprey peak redd density and percent of sites occupied in random Winter Steelhead spawning surveys, 2012 to 2024.

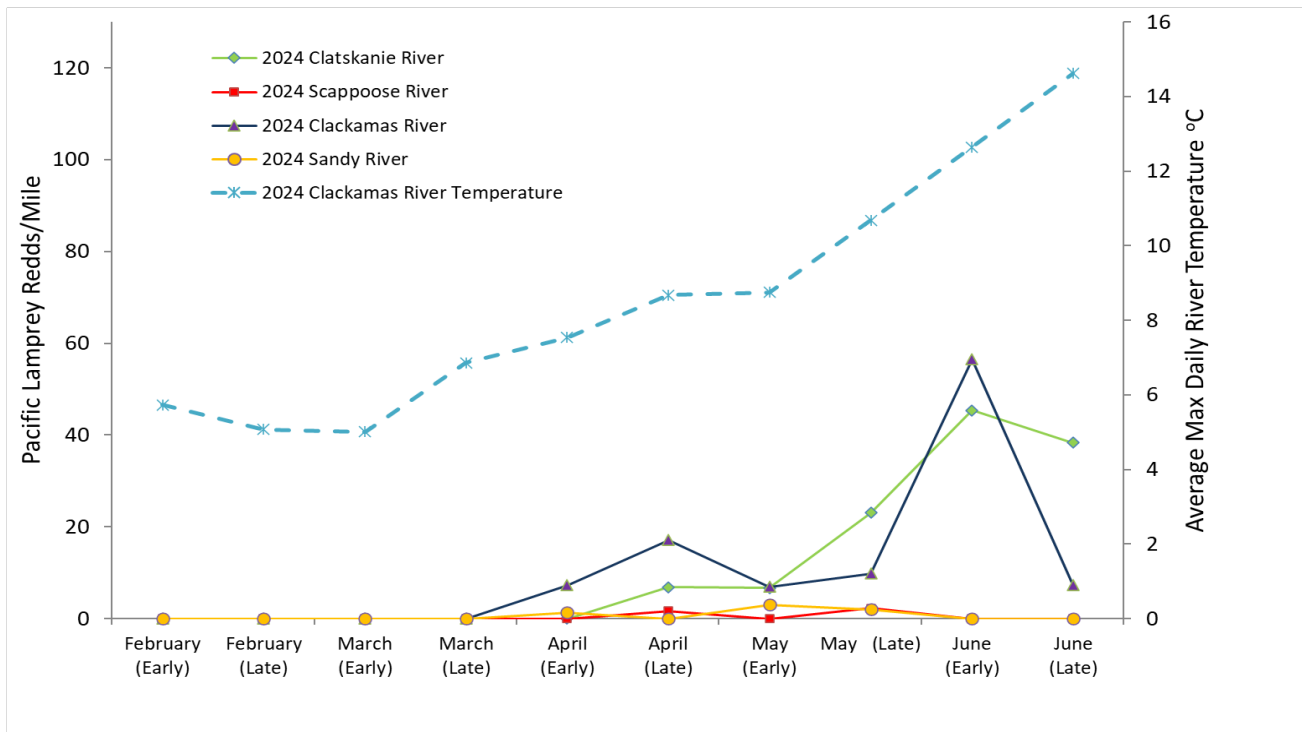


Figure 13. Lower Columbia Pacific Lamprey spawn timing in random and supplemental Winter Steelhead surveys in 2024 and average daily max water temperature in the Clackamas River.

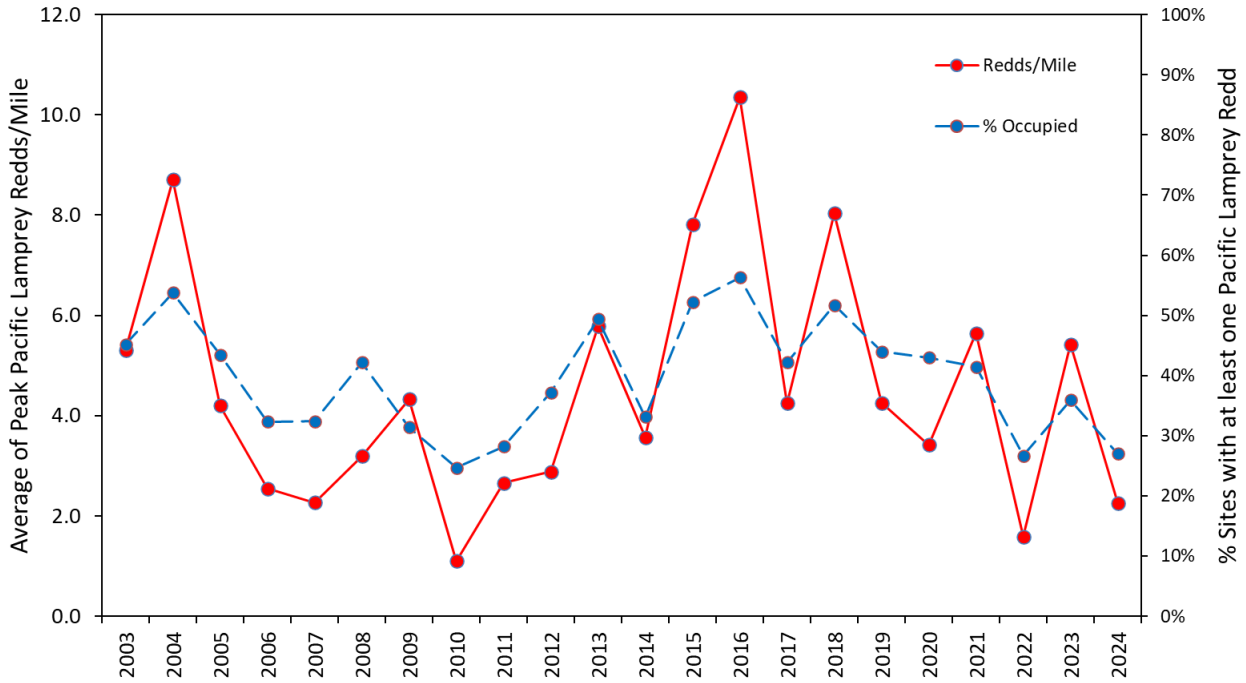


Figure 14. Oregon Coast Pacific Lamprey peak redd density and percent of sites occupied in random Winter Steelhead spawning surveys, 2003 to 2024.

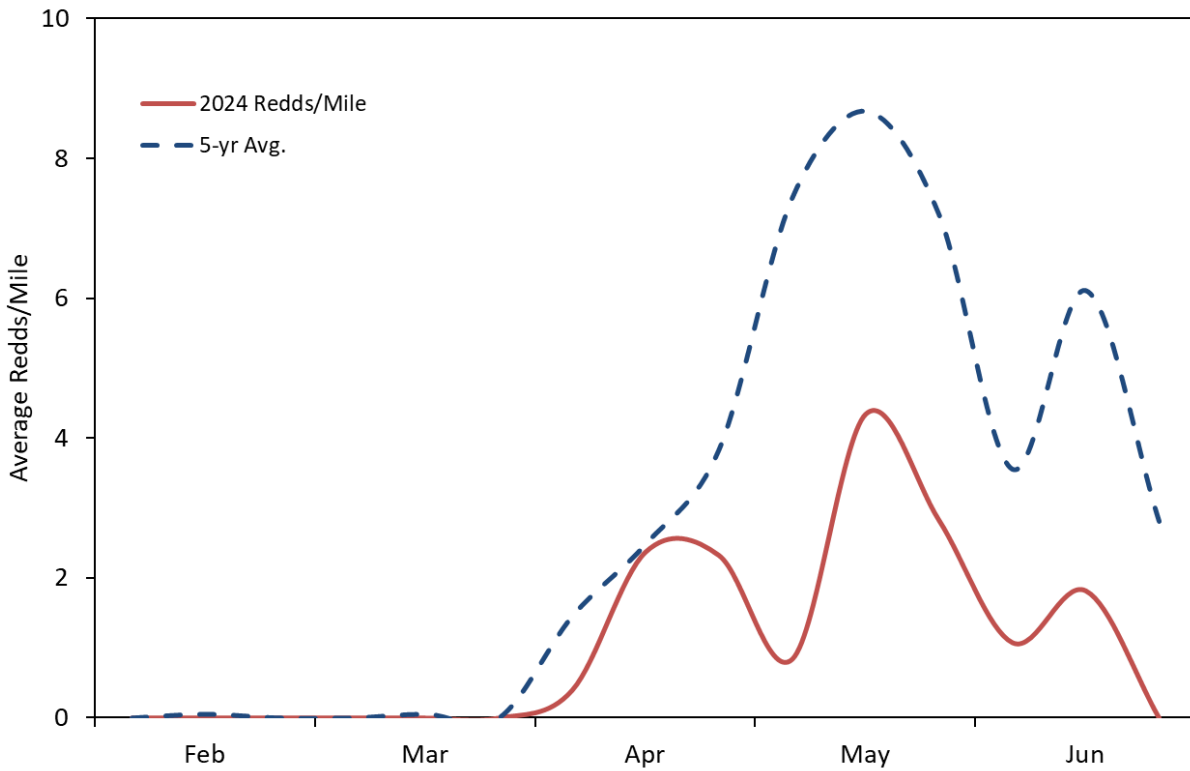


Figure 15. Oregon Coast Pacific Lamprey spawn timing in index surveys, 2024.



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