THE OREGON PLAN *for Salmon and Watersheds*

Assessment of Oregon Coastal Adult Winter Steelhead – Redd Surveys 2009

Report Number: OPSW-ODFW-2009-09

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Table of Contents

List of Figures

List of Tables

SUMMARY

This report provides a summary of results from winter steelhead spawning ground surveys conducted along the Oregon coast in 2009. Sufficient surveys were conducted to meet precision estimates at the DPS level in the Oregon Coast DPS, while precision in the Klamath Mountains Province DPS failed to reach goals. Winter steelhead redd estimates for the 2009 spawning year were down compared to prior years for these distinct population segments. Regional patterns are apparent for redd density, hatchery independence, and spawn timing.

INTRODUCTION AND METHODS

As part of the Oregon Plan for Salmon and Watersheds, the Oregon Department of Fish and Wildlife (ODFW) initiated a project to monitor spawning winter steelhead (*Oncorhynchus mykiss*) in coastal Oregon streams in 2003. This project is designed to assess the yearly status and trend, presence of hatchery fish, and distribution of winter steelhead spawners in six coastal Monitoring Areas (MA) in two Distinct Population Segments (DPS) (Figure 1). In 2008 the project was modified to assess status only at the DPS level.

A spatially balanced probabilistic sampling design (Stevens 2002) was used to select survey sites across a stream network of winter steelhead spawning habitat. The selection frame was developed using best professional knowledge of biologists from a variety of private and governmental organizations. Monitoring of winter steelhead abundance is based on counts of redds instead of live or dead fish, in accordance with prior work conducted by ODFW in Oregon coastal streams (Susac and Jacobs 1999). Repeat visits to each site from February through May generated a total redd count for each survey. Redds were marked with colored rocks and flagging to prevent re-counting during subsequent surveys. The survey interval of once every fourteen days is based on prior research (Susac and Jacobs 1999). Specific descriptions of project protocols can be found in the annual survey procedures manual (ODFW 2009). More information on methods and study background is available in Suring (In Prep.).

RESULTS AND DISCUSSION

This report contains monitoring area level summaries for each steelhead DPS along the Oregon Coast. Counts of lamprey redds and adults are recorded during steelhead surveys but are not reported here. Additional data for individual sites is available by contacting the Oregon Adult Salmonid Inventory and Sampling (OASIS) project.

The 95% confidence interval for monitoring area estimates was within the target precision of ±30% for the Oregon Coast DPS, however this confidence goal was exceeded in the Klamath Mountains Province DPS (KMP) (±34%). Sites were selected at a rate of 1/31 miles of habitat, with higher density sampling above Gold Ray Dam (Rogue Basin, 1/21 miles). Forty-nine percent of the total number of sites selected were successfully surveyed (Table 1). Twelve percent of sites coast-wide were not surveyed because of landowner access restrictions, with

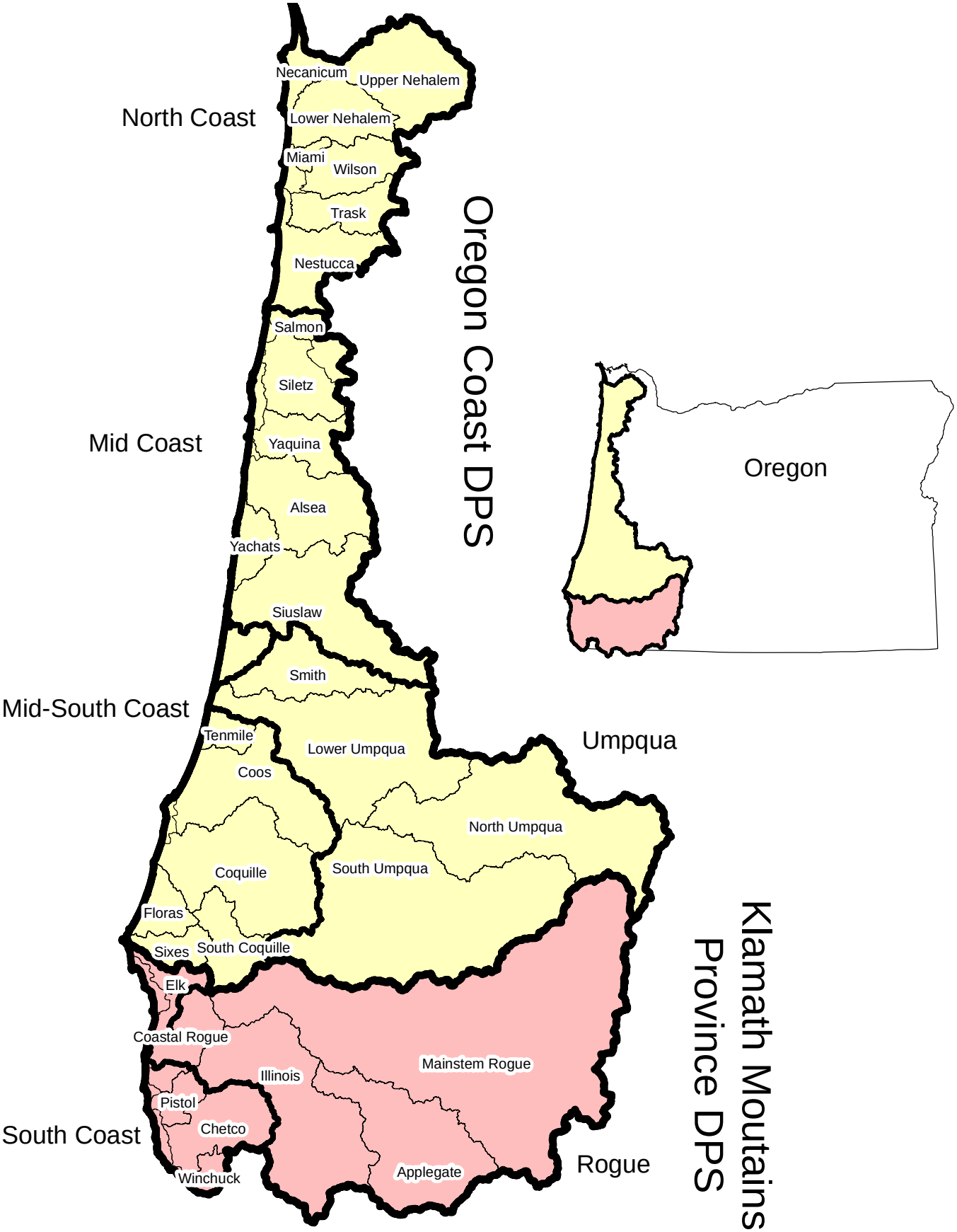

Figure 1. Steelhead monitoring study area showing the winter steelhead populations, monitoring areas and distinct population segments.

Table 1. Site status by monitoring area. Target sites fell within steelhead 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 steelhead spawning habitat.

DPS	Monitoring Area	Target Response	Target Non-response	Non-target
Oregon Coast	North Coast	26	10	7
	Mid Coast	32	12	7
	Mid South Coast	19	12	2
	Umpqua	21	28	5
	Total	**98**	**62**	**21**
Klamath Mountains Province	South Coast	10	21	1
	Rogue River	26	32	3
	Total	**36**	**53**	**4**

the Mid-South Coast having the highest proportion of access denials. Nineteen percent of the sites in the South Coast were too remote to survey because of their location in a road less area. The proportion of sites selected that were considered outside of steelhead spawning habitat ranged from 3% (South Coast) to 16% (North Coast). Twelve percent of sites surveyed coast-wide were not used in estimates due to poor survey conditions or large gaps in data.

Oregon Coast DPS

The 2009 estimate of wild winter steelhead redds in the Oregon Coast DPS is lower than previous years (Figure 2), with the 40,930 wild redds estimated in the Oregon Coast DPS being relatively evenly distributed among the monitoring areas (Table 2). Although the number of redds is fairly even between monitoring areas, the density of redds (redds/mile of steelhead spawning habitat) is not equal (Figure 3). The North Coast MA had the highest density of wild winter steelhead redds, at 16 redds/mile with 69% of sites having at least one redd. The Mid Coast, Mid-South and Umpqua MAs had densities of 10, 14, and 7 redds/mile, with 88%, 89%, and 81% of sites with at least one redd.

The proportion of hatchery steelhead naturally spawning varied among the monitoring areas (Table 3), with the Mid-South Coast having the highest proportion of hatchery produced fish and no observations of hatchery fish in the Umpqua (Figure 4).

Oregon Coast winter steelhead spawn timing in 2009 (Figure 5) was similar to the previous year in all monitoring areas (Suring et.al. 2008). Peak counts of steelhead redds occurred later in the North Coast MA, early April, than in the other three MAs, late February (Figure 5). Stream discharge was also roughly normal, with elevated flows in early January, followed by a period of lower than normal discharge through early March. No unusual influence on run timing or survey viability is thought to have occurred from this flow regime (Figure 6)

Table 2. Coastal Oregon 2009 winter steelhead redd abundance estimates. Estimates are derived from counts in random GRTS spawning surveys.

		Survey Effort		Winter Steelhead Redd Abundance			
				Total		Wild[a]	
DPS	Monitoring Area	Number of Surveys	Miles	Estimate	95% Confidence Interval	Estimate	95% Confidence Interval
Oregon Coast	North Coast	26	22.8	12,389	7,176	10,433	6,043
	Mid Coast	32	26.8	13,987	3,873	12,080	3,345
	Mid South Coast	19	21.2	11,212	7,017	9,136	5,718
	Umpqua	21	16.7	9,282	4,066	9,282	4,066
	Total	**98**	**88.0**	**46,870**	**11,501**	**40,930**	**9,845**
Klamath Mountains Province	South Coast	18	16.9	14,268	6,904	14,268	6,904
	Rogue River	18	24.7	12,352	6,012	12,352	6,012
	Total	**36**	**41.6**	**26,620**	**9,155**	**26,620**	**9,155**

a *Estimates of wild spawners derived through application of live and carcass fin-mark recoveries in random surveys.*

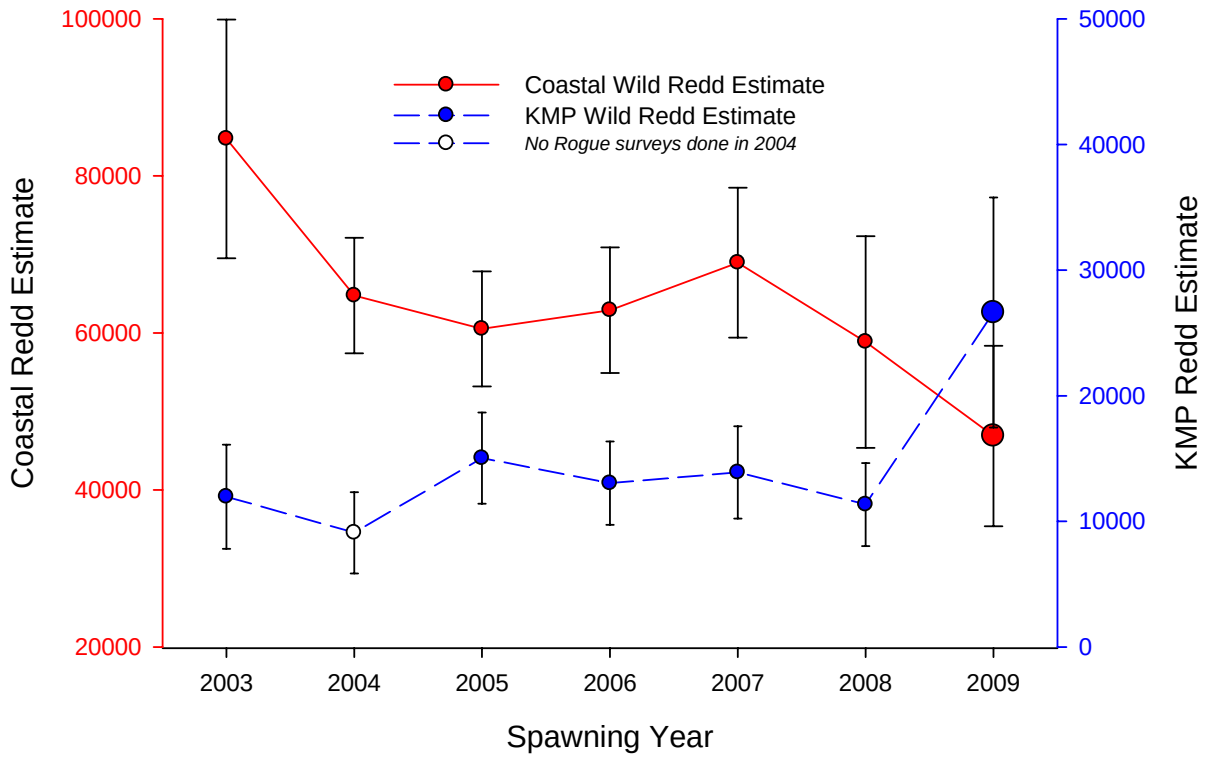

Figure 2. Winter steelhead wild redd estimates based on random surveys from 2003 to 2009. Error bars are 95% confidence intervals. 2004 KMP data does not include the Rogue.

Klamath Mountains Province DPS

In the area below Gold Ray Dam we estimate there were 26,620 wild steelhead produced redds in the Klamath Mountains Province DPS (Table 2). This estimate is significantly higher than other years (Figure 2). The density of wild produced redds in the South Coast MA was higher than in the Rogue MA (9 and 5 redds/mile, respectively). A least one redd was found in 94% of South Coast sites and in 83% of Rogue sites.

No observations of hatchery fish were made in either MA during the 2009 spawning season, though a small sample size in the Rogue River MA may have contributed to this relatively low hatchery presence (Table 3). Peak spawn timing was normal in the Rogue MA, though an unusual secondary spike occurred four weeks after the peak date. Spawning activity in the South Coast MA began earlier than in the Rogue, with the highest week of spawning occurring around the same time as in the Rogue (Figure 5).

Table 3. Percentage of hatchery fish found on spawning surveys in 2009 based on adipose fin clip observations of live and dead steelhead.

DPS	Monitoring Area	Known Fish	Hatchery Percentage
Oregon Coast	North Coast	19	16%
	Mid Coast	22	14%
	Mid South Coast	27	19%
	Umpqua	22	0%
	Total	**90**	**12%**
Klamath Mountains Province	South Coast	57	0%
	Rogue River	9	0%
	Total	**66**	**0%**

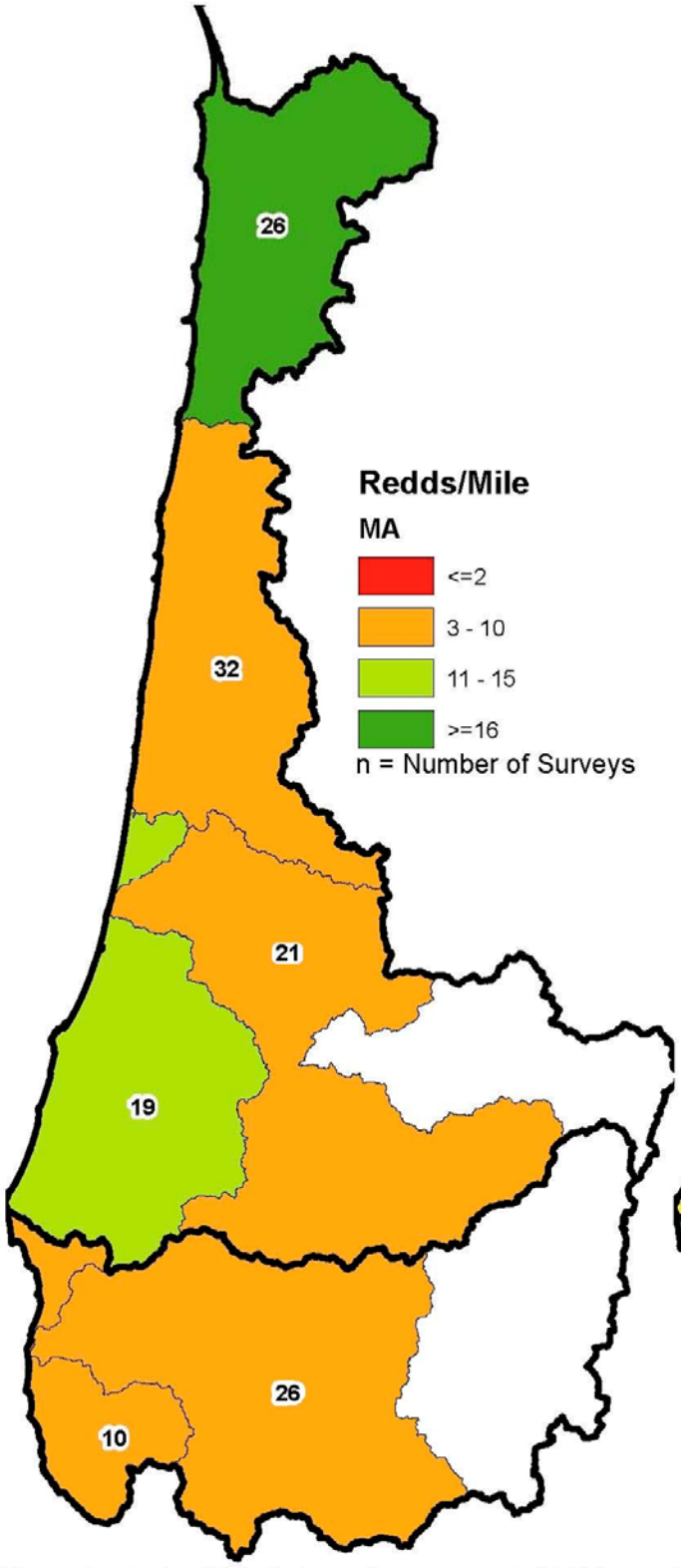

Figure 3. Total redds/mile in random surveys in 2009 by monitoring area with the number of surveys in each monitoring area.

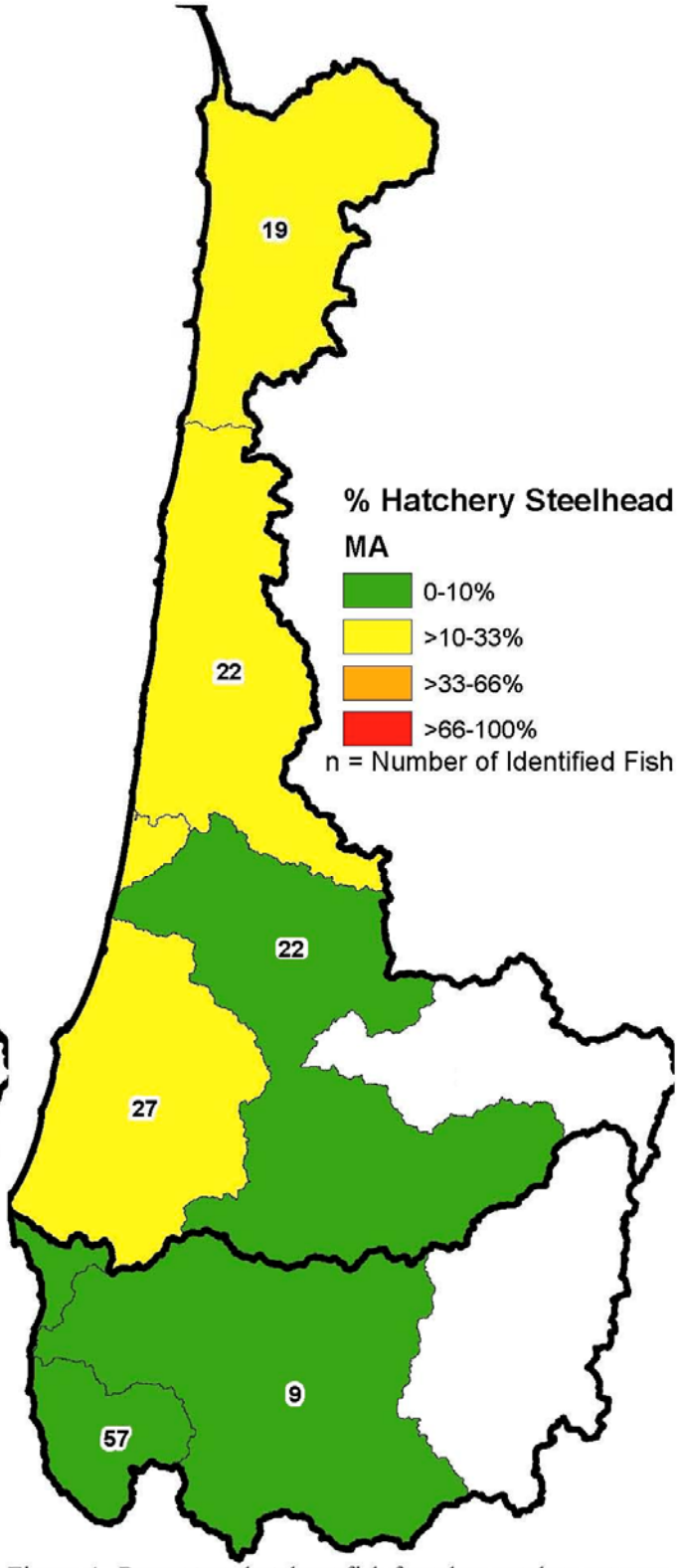

Figure 4. Percentage hatchery fish found on random surveys in 2009 based on adipose fin clip observations of live and dead steelhead. Data in each monitoring area may be based on multiple surveys.

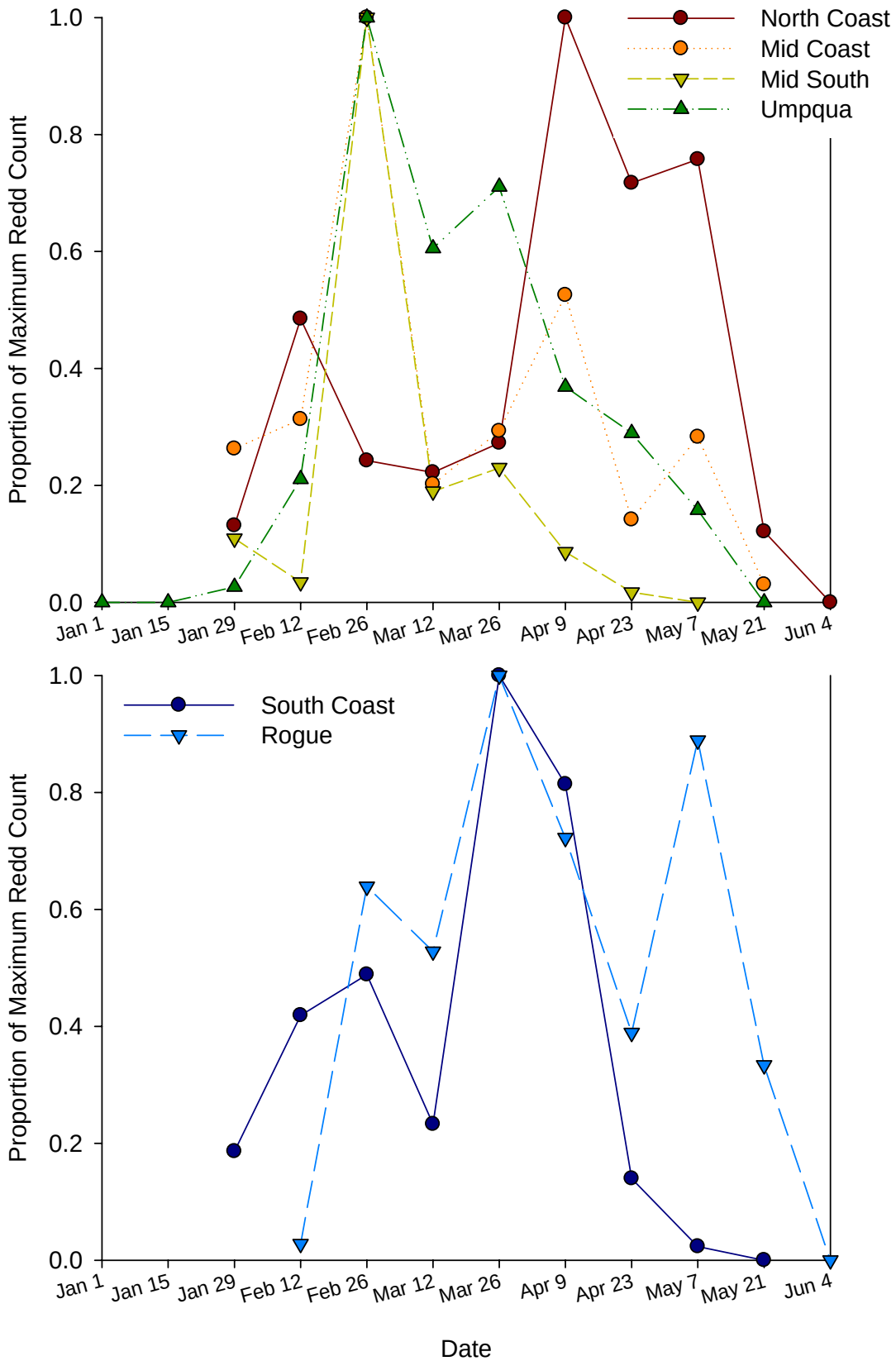

Figure 5. Proportion of the maximum winter steelhead redd count in each of the six monitoring areas by week of the year during 2009.

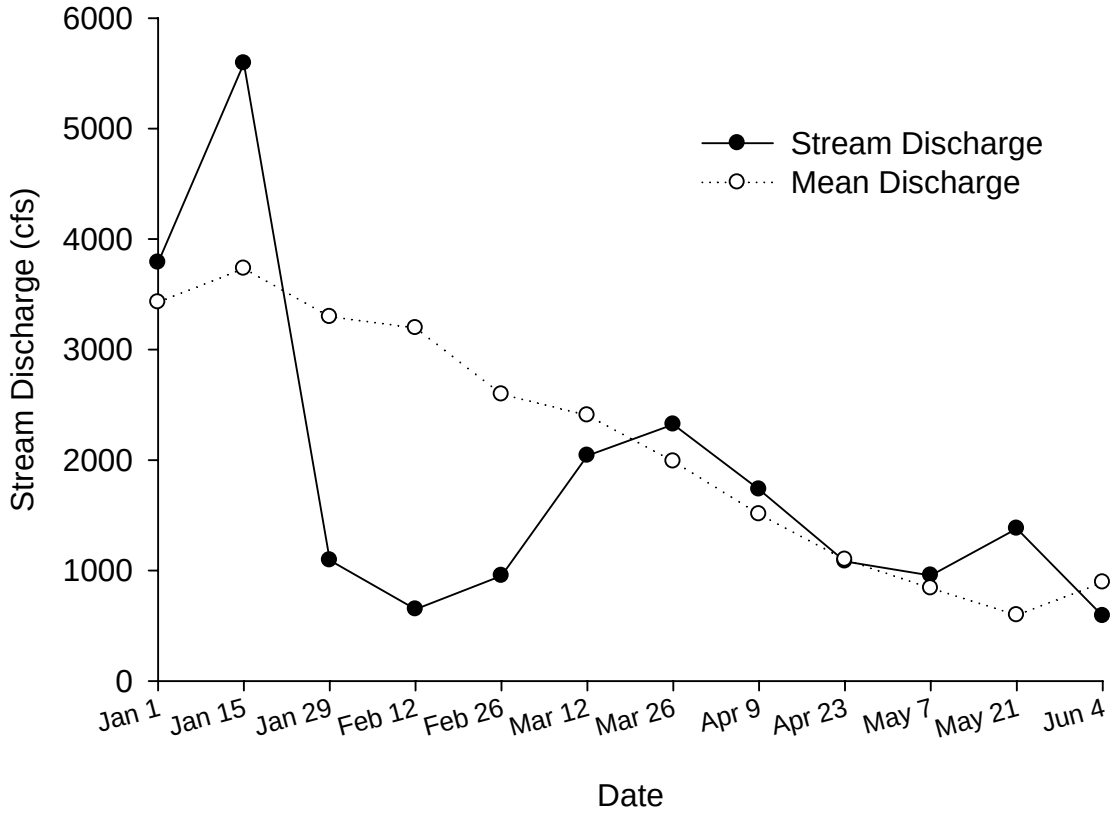

Figure 6. Stream discharge at Alsea River near Tidewater during 2009, compared to mean discharge from 1939 to 2006.

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