

Russian River Coho Salmon and Steelhead Monitoring

UPDATE: SUMMER - FALL 2015



Since 2004, the Russian River Coho Salmon Captive Broodstock Program has released juvenile coho salmon into tributaries of the Russian River with the goal of reestablishing populations that were on the brink of extirpation from the watershed. The University of California Cooperative Extension and California Sea Grant (UC) have been tracking the progress of this effort by monitoring coho at all life stages within their historic range.

Over the last decade, our program has expanded to include more broad-scale salmon and steelhead monitoring, as well as specialized studies, with the intention of providing science-based information to all stakeholders involved in the recovery of these critical native species. This work would not be possible without the support of our partners, including public resource agencies, non-profit organizations, and hundreds of private landowners who have graciously allowed us to access the streams that flow through their properties.

This update is an overview of preliminary results from our summer and fall 2015 field activities. A complete report can be viewed on our website.

ca-sgep.ucsd.edu/russianrivercoho

Documenting naturally-spawned salmon and steelhead juveniles

We conducted summer snorkeling surveys in Russian River tributaries to document the distribution and abundance of juvenile coho salmon and steelhead. Between June 10 and August 27, biologists surveyed a total of 58 reaches on 155 km of stream.

We observed 5,063 naturally-spawned (wild) coho fry, or young-of-year (YOY) in the summer of 2015, in all streams sampled using standardized methods. Because only every second pool was snorkeled, we doubled that number to derive an estimate of 10,126 (Table 1). We observed 13,571 wild steelhead YOY (estimate of 27,142). Portions of five additional streams were also snorkeled opportunistically during scouting visits, resulting in another 38 steelhead YOY observations (Table 2).

For coho YOY, this represents a significant increase from the number observed during the summer of 2014 (Figure 1). Although there was generally higher abundance in 2011-2015 when compared to 2006-2010, differences in the number of streams sampled each year mean that no clear trend can yet be established. In 2015, minimum counts were highest in Green Valley and Willow Creeks, and 10 or more coho YOY were observed in 19 of the 35 creeks sampled using standardized methods (49%) (Figure 2). It is unlikely that successful spawning occurred in streams where fewer than 10 coho YOY were observed, and probable that juveniles moved in from a nearby stream.

>> For results by stream, see Appendix, Tables 1 and 2



UC Fish Biologist Will Boucher conducting a snorkel survey in Green Valley Creek.



UC Fish Biologist Nick Bauer gives a thumbs up while snorkeling Green Valley Creek.

Assessing late-summer habitat conditions

In many small coastal streams of California, streamflow can drop to little or nothing by late summer, seriously limiting the amount of habitat available to juvenile fish. In late August through September, biologists conducted “wetted habitat” surveys on 14 streams in the Russian River watershed to record surface flow conditions as wet (connected by continuous stream flow), intermittent (wet pools not connected by stream flow), or dry (Figure 3).

Of the 107 km of stream surveyed, 42 km (39%) were dry, 20 km (19%) were intermittent and 45 km (42%) were wet. Tributaries of Dry Creek and Porter Creek contained the highest proportions of dry habitat and Mark West and Austin Creek tributaries contained the least (Figure 4). High water temperatures and low dissolved oxygen levels in intermittent pools suggested that, in general, the habitat in intermittent reaches was not suitable for juvenile salmonids.

We compared this data to locations where we had observed spawning adults and newly hatched young in our winter and early summer surveys to determine whether juveniles would be able to survive in the stream reaches where they were spawned or were rearing. Of the 224 salmon redds (nesting sites) documented in the 14 wetted habitat survey streams last winter, 65% were observed in reaches that later went dry, 18% in reaches that became intermittent, and 17% in reaches that remained wet. Of the 13,629 coho and steelhead YOY counted during summer snorkeling surveys in those same streams, 37% were observed in reaches that later went dry, 24% in reaches that became intermittent, and 39% in reaches that remained wet. Dry Creek tributaries and Porter Creek had the highest proportions of redds and juveniles in reaches that later went dry, and Mark West and Austin Creek tributaries had the highest proportions of redds and juveniles in reaches that remained wet.

>> *Maps that display wetted habitat results and the relationship between redds and juvenile counts can be found at: go.ucsd.edu/1N5aGu*



Naturally-spawned coho YOY in Black Rock Creek

Low stream flow takes toll on juvenile salmon and steelhead in 2015

Because flows were generally too low to allow fish to move into different stream reaches, we concluded that salmonids observed during snorkeling surveys in reaches that later became dry had no chance of surviving the summer. Research conducted by our program has documented that the longer pools are disconnected from surface flow, the more likely it is that juvenile coho will not survive. Given the length of time that pools in intermittent reaches were disconnected during the summer of 2015 (over four weeks in most reaches), it is likely that most juveniles in intermittent reaches perished, as well.

These results strongly suggest that low streamflow is a significant bottleneck to oversummer survival of juvenile salmonids in many Russian River tributaries, particularly in drought years such as 2015.

Although it is encouraging that naturally-spawned coho were observed in close to 20 Russian River tributaries in 2015, over 60% of them were found in reaches that later became dry or intermittent. Survival would not have been possible without CDFW’s efforts to relocate fish to suitable reaches, which was only achieved through landowner support and cooperation.

Get involved:

The Russian River Coho Water Resources Partnership (www.cohopartnership.org) is working with streamside landowners to improve instream flows for fish and water reliability for people by developing alternatives to direct withdrawal from surface waters and near-stream wells.

For more information on how you can get involved, please contact the Sonoma or Gold Ridge Resource Conservation District at:

cohopartnership.org/contact.html

FOR COMPLETE REPORT, VISIT:
go.ucsd.edu/1N5aR7A

APPENDIX OF TABLES AND FIGURES

TABLE 1. Wild coho salmon and steelhead YOY observed during summer 2015 snorkel surveys.

Stream	Coho YOY observed ¹	Expanded coho YOY ²	Steelhead YOY observed ¹	Expanded steelhead YOY ²
Austin Creek	8	16	798	1,596
Black Rock Creek	123	246	65	130
Dead Coyote Creek	0	0	88	176
Devil Creek	45	90	218	436
Dutch Bill Creek ³	650	1,300	467	934
East Austin Creek	14	28	2,189	4,378
Felta Creek	50	100	217	434
Freezeout Creek	216	432	13	26
Gilliam Creek	201	402	376	752
Grape Creek	0	0	260	520
Gray Creek	329	658	981	1,962
Green Valley Creek ⁴	1,147	2,294	1,043	2,086
Grub Creek	0	0	4	8
Harrison Creek	0	0	0	0
Hulbert Creek	26	52	2	4
Kidd Creek	0	0	90	180
Little Green Valley Creek	31	62	0	0
Mark West Creek	22	44	754	1,508
Mill Creek ⁵	297	594	2,388	4,776
Nutty Valley Creek	0	0	0	0
Palmer Creek	17	34	10	20
Pechaco Creek	0	0	2	4
Pena Creek	16	32	1,873	3,746
Perenne Creek	2	4	0	0
Porter Creek	504	1,008	549	1,098
Porter Creek (MWC)	0	0	191	382
Press Creek	0	0	0	0
Purrington Creek	140	280	52	104
Redwood Creek	0	0	106	212
Sheephouse Creek	0	0	8	16
Thompson Creek	0	0	13	26
Wallace Creek	0	0	0	0
Willow Creek	1,139	2,278	72	144
Wine Creek	86	172	104	208
Woods Creek	0	0	638	1,276
Grand Total	5,063	10,126	13,571	27,142

¹ Number of YOY observed in pools snorkeled; every second pool was snorkeled.

² Expanded count is the observed count multiplied by 2, since every second pool was snorkeled.

³ 1,008 coho YOY were stocked prior to snorkel surveys.

⁴ 305 coho YOY were stocked prior to snorkel surveys. 275 naturally-spawned YOY were observed prior to stocking.

⁵ 509 coho YOY were stocked prior to snorkel surveys. 55 naturally-spawned YOY were observed prior to stocking.

TABLE 2. Minimum count of wild coho salmon and steelhead observed in streams that were partially snorkeled during the summer of 2015¹.

Stream	Coho YOY	Steelhead YOY	Total reach length ² (km)	% of reach snorkeled
Jonive Creek	0	27	3.1	32%
Redwood Creek (Atascadero)	0	11	1.6	7%
Sexton Creek	0	0	1.0	10%
Sulphur Creek	0	0	2.0	20%
Weeks Creek	0	0	3.2	13%

¹ Small portions of these streams were opportunistically snorkeled during reconnaissance surveys. Because reaches were not thoroughly sampled, results were not included in basinwide observation totals.

² Refers to defined reach of stream believed to have suitable salmon and steelhead rearing habitat.

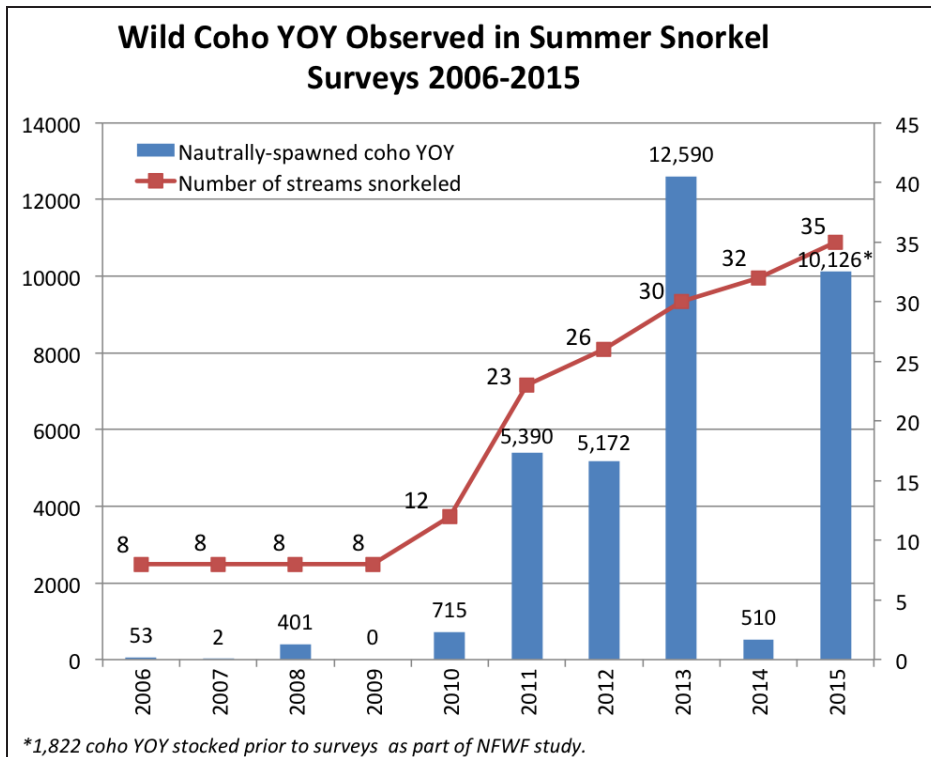


FIGURE 1. Naturally-spawned (wild) coho YOY observations from Russian River snorkel surveys (2006-2015). Methods for estimating wild juvenile coho counts varied among years and were based upon timing of hatchery stocking and snorkel methods.

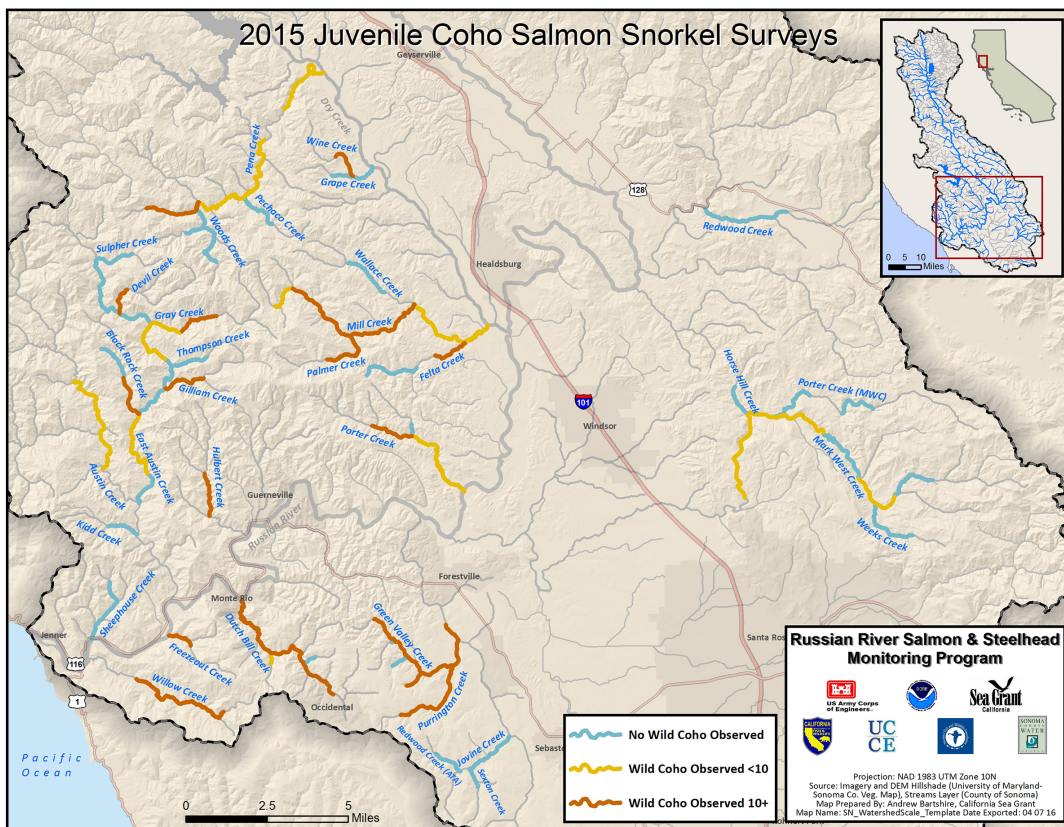


FIGURE 2. Map of 2015 wild coho salmon YOY observations.



FIGURE 3. The same pool in Lower Mill Creek when wet (7/1/15), intermittent (8/3/15), and dry (9/9/15).

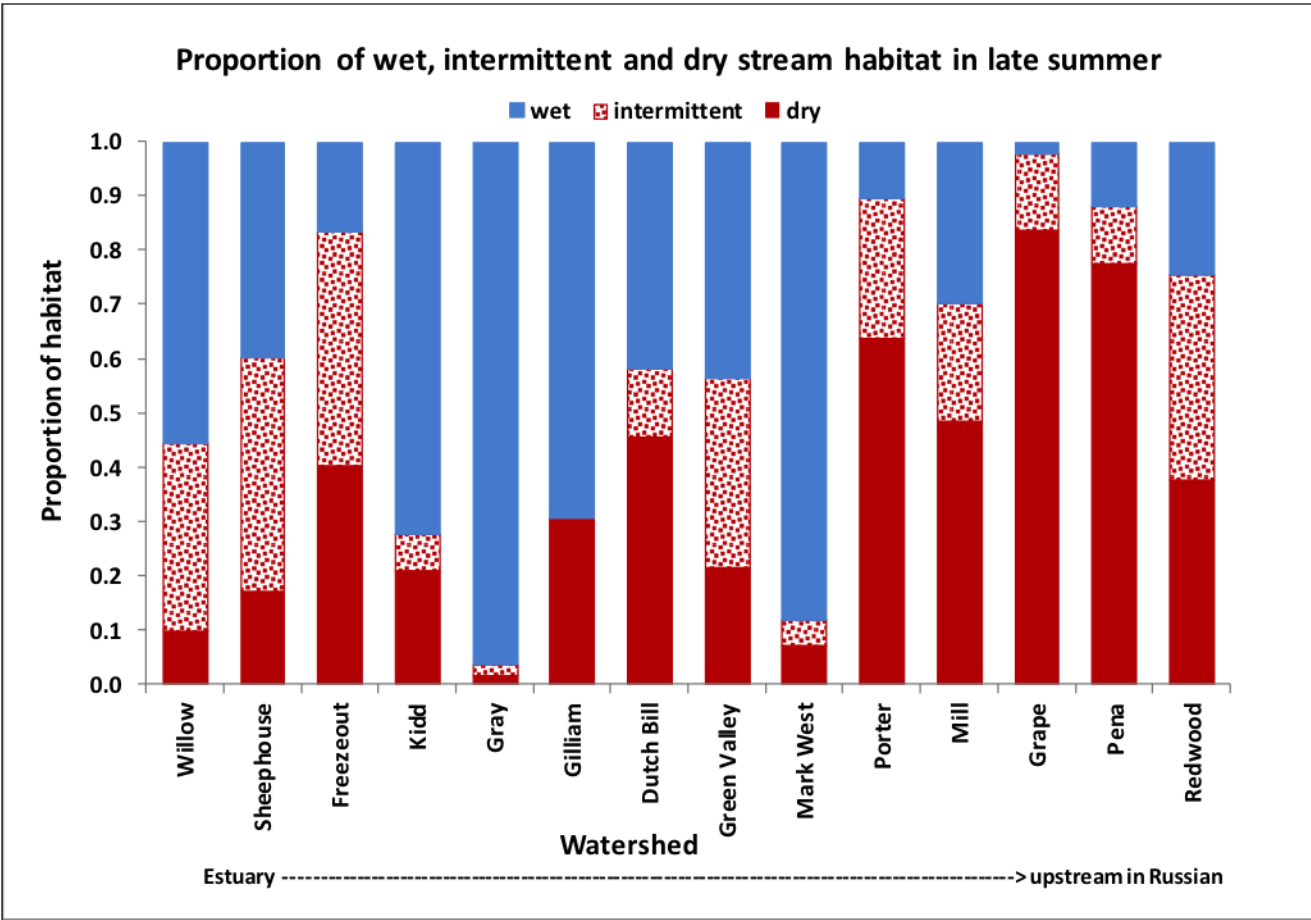


FIGURE 4. Proportion of wet, intermittent, and dry habitat in 14 Russian River tributary watersheds surveyed during late summer 2015.