



ARTICLE

Spring 2017 Downstream Migrant Trapping Summary

Golden Gate National Recreation Area (<https://www.nps.gov/goga/>), Muir Woods National Monument (<https://www.nps.gov/muwo/>), Point Reyes National Seashore (<https://www.nps.gov/pore/>)

- Coho and Steelhead Monitoring Program

Thank you to all of the volunteers who participated in the 2017 downstream migrant trapping surveys on Olema and Redwood Creeks! Through your dedication and flexibility, we were able to successfully run traps at three locations throughout the spring.

Trapping Season Overview

The 2017 [coho and steelhead](https://www.nps.gov/rlc/pacificcoast/coho-steelhead.htm) (<https://www.nps.gov/rlc/pacificcoast/coho-steelhead.htm>), smolt trapping

season began in mid-March. We constructed two traps on Redwood Creek and one trap on Olema Creek. One of the Redwood Creek traps was a backwater trap constructed in addition to our normal mainstem trap. It was used to assess how salmonids use the creek backwater during the late winter/early spring months. The mainstem trap was installed just upstream of the backwater trap to estimate the total number of coho smolts leaving Redwood Creek. Together, the traps assist in assessing the success of recent restoration work, as well as help monitor Redwood Creek's annual coho smolt outmigration.

The Olema Creek trap was placed approximately 1.5 km upstream of the confluence with Lagunitas Creek and downstream of the town of Olema. Like the mainstem Redwood Creek trap, it was used to assess coho smolt outmigration.

Happening Now!

Although our smolt trapping season has come to a close, our summer monitoring is underway. Summer monitoring will provide juvenile coho and steelhead population size and distribution data for Olema, Pine Gulch, and Redwood Creeks. To obtain this information we use a combination of snorkeling and electrofishing surveys that will continue through September. Snorkeling and electrofishing provide excellent opportunities to monitor and observe a wide variety of aquatic species including coho salmon, steelhead trout, stickleback, sculpin, and salamanders.

Results

Total Smolt Captures & Production Estimates

The mainstem Redwood Creek trap was in operation for 63 days and captured a total of 612 coho smolts. The backwater Redwood Creek trap was in operation for 44 days and captured one coho smolt on April 3rd. The Olema Creek trap was in operation for 60 days and captured a total of 1,145 coho smolts.

Figures 1 & 2 show coho smolt production estimates, or the estimated total number of smolts emigrating to saltwater, for each monitored watershed. The estimates are based on the total number of fish captured, as well as on our understanding of other factors like typical fish survival and trap effectiveness. The preliminary 2017 coho smolt production estimate for Redwood Creek is 897 smolts (SE 160). The preliminary 2017 coho smolt production estimate for Olema Creek is 5,698 smolts (SE 587).

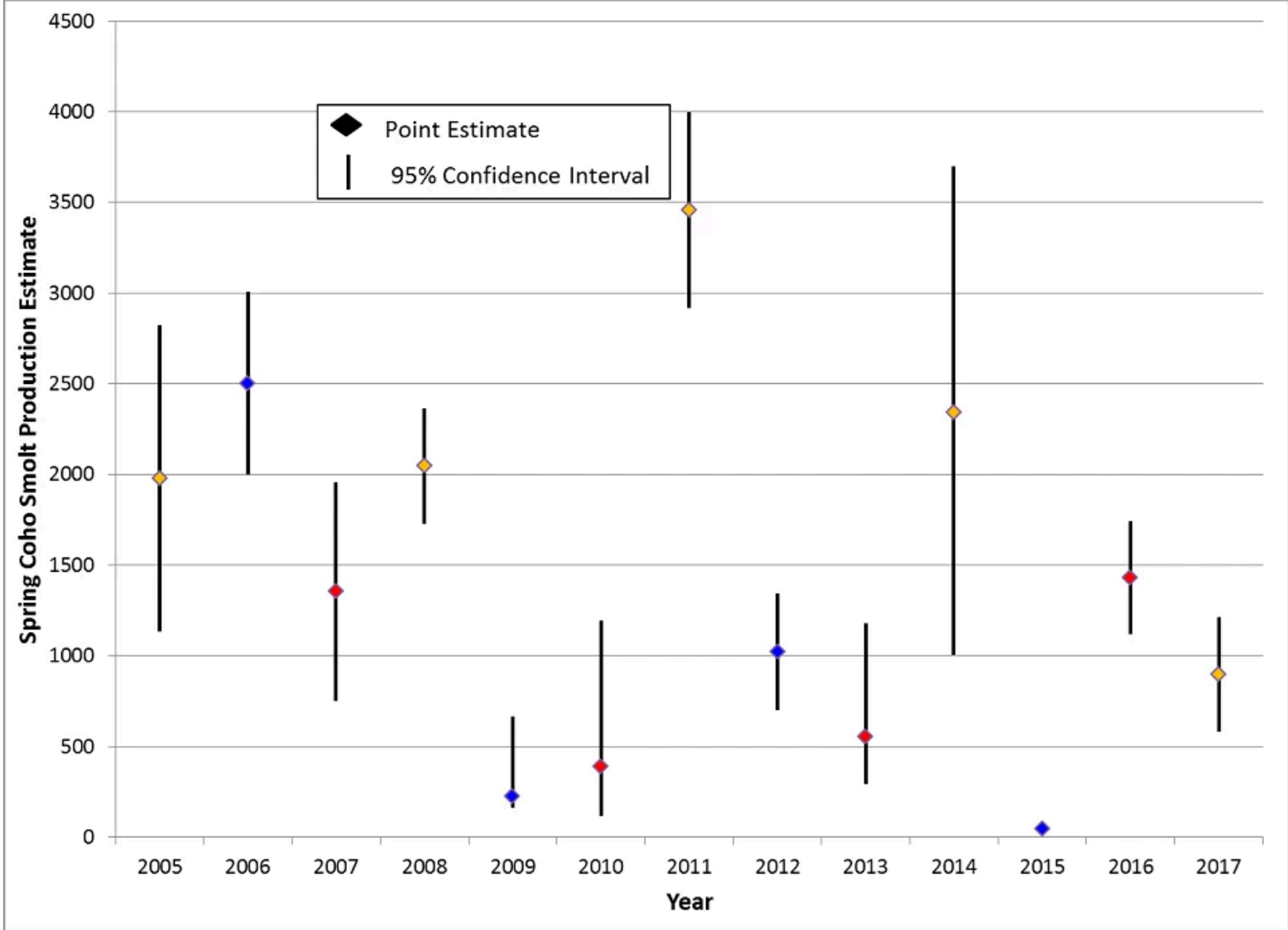


Figure 1. Coho smolt production estimates for Redwood Creek, spring 2005-2017. Colors indicate related cohorts. Coho smolt production decreased when compared with the previous time smolts of this cohort (yellow) migrated out to sea in 2014.

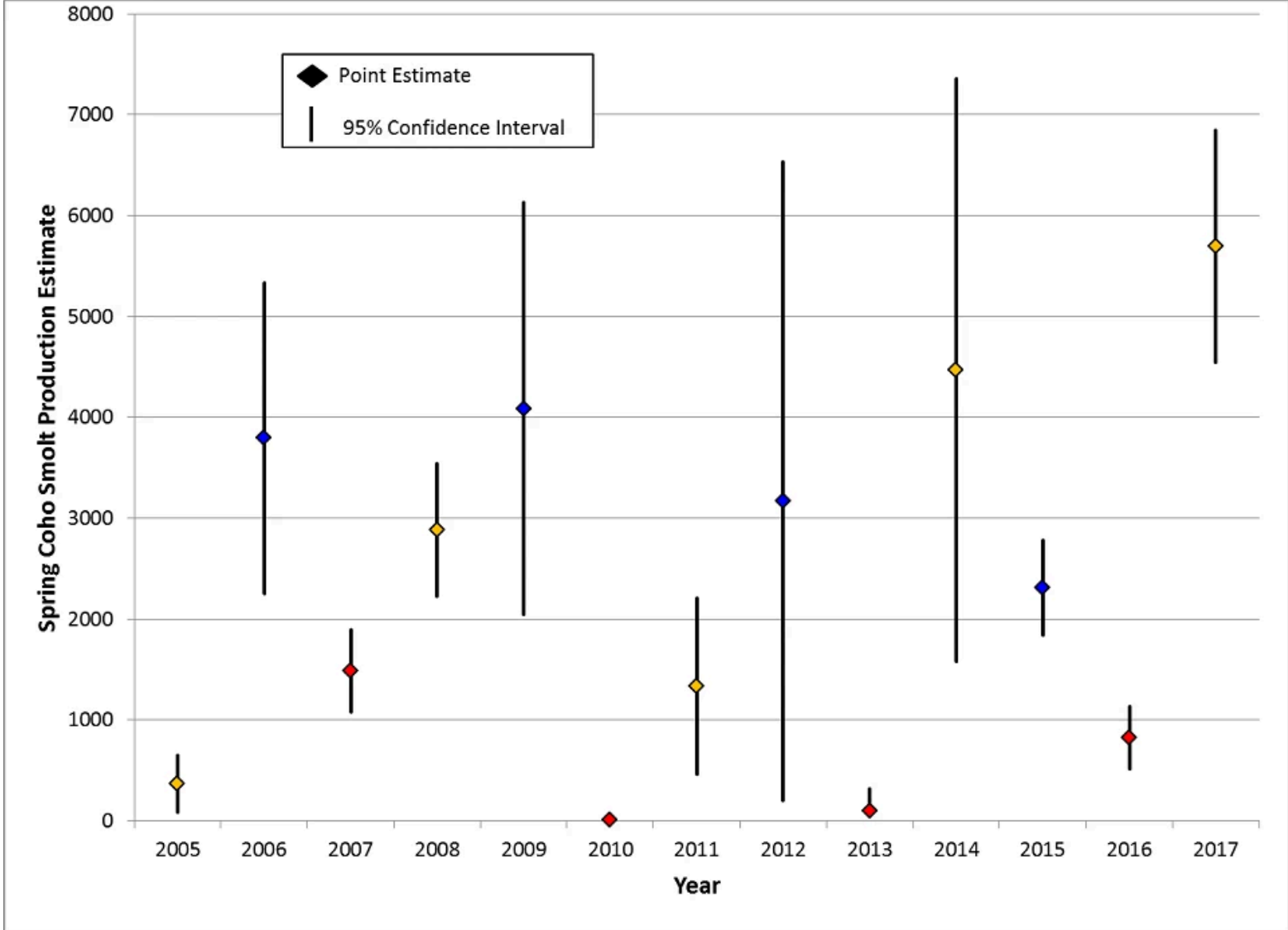


Figure 2. Coho smolt production estimates for Olema Creek, spring 2005-2017. Colors indicate related cohorts. Coho smolt production increased on Olema Creek when compared with the previous time smolts of this cohort (yellow) migrated out to sea in 2014.

Migration Timing

The mainstem Redwood Creek trap captured its first smolt on March 16. Outmigration peaked on Redwood Creek during the ninth week of trapping (May 9-May 15), when a total of 207 coho smolts were captured. The timing of peak outmigration was a week later than historic peak captures at this location.

The first coho smolt capture on Olema Creek occurred on April 2. The Olema Creek outmigration peaked during the seventh week of trapping (April 25-May 1) when a total of 442 coho smolts were caught.

Fish Size

Fork length, or the length of a fish from its snout to the fork in its caudal (tail) fin, is one measure of fish size recorded for all captured smolts. On the Redwood Creek mainstem, the average 2017 coho smolt length was 107 mm, smaller than the historic average. Redwood Creek steelhead smolts were also smaller than average in 2017, with an average fork length of 142 mm.

The average fork length of coho smolts captured in Olema Creek in 2017 was 121 mm, the highest average length on record for the Creek since monitoring began. The average fork length of Olema Creek steelhead smolts was 157 mm, similar to historic average.

PIT Tagging and Fish Growth

For the ninth consecutive trapping season, passive integrated transponders (PIT tags) were used to tag a portion of the captured coho smolts. These tags individually identify every tagged fish and provide us with a

variety of useful data. For example, during the smolt trapping season, they are used to gauge the efficiency of the mainstem traps, and to calculate production estimates for each watershed.

These same PIT tagged fish can turn up in the course of future monitoring efforts as well. For instance, coho smolts tagged during the 2017 trapping season can be detected again when they return as adults during the winter of 2018-2019. Such recapture information can then be used to increase the accuracy of adult return estimates and improve our understanding of the factors that affect smolt survival in the ocean.

A total of 246 coho smolts were PIT tagged this year in Redwood Creek. We also captured 22 coho smolts that had been tagged during the summer of 2016.

With measurements on record from their first capture, PIT tagged fish provide an opportunity to learn about fish growth. These recaptured fish showed an average increase of 31 mm in fork length and 7.1 g in weight (Table 1).

On Olema Creek, we tagged 426 coho smolts. We also recaptured nine coho smolts that were tagged as juveniles in the summer of 2016. On average, these recaptured fish showed an increase of 51 mm in length and 12.4 g in weight (see Table 1.).



This juvenile steelhead is about to be measured to the nearest millimeter, from the tip of its snout to the fork of its tail fin. The data helps determine how fish size changes over time. In general, larger salmonids have a higher chance of survival than smaller ones both in the creek and at sea.

Madison Halloran / NPS

Creek	Year	Number of PIT tagged coho recaptured	Average weight increase(summer to spring)	Average fork length increase (summer to spring)
Redwood	2010	4	10.5 g	40 mm
Redwood	2011	52	9.4 g	34 mm
Redwood	2012	2	14.4 g	48 mm
Redwood	2013	7	10.9 g	39 mm
Redwood	2014	20	11.8 g	44 mm
Redwood	2015	1	0 g	7 mm
Redwood	2016	13	16.7 g	53 mm
Redwood	2017	22	7.1	32mm
Olema	2011	3	8.1 g	35 mm
Olema	2012	3	11.2 g	38 mm
Olema	2013	0	NA	NA
Olema	2014	10	10.2 g	43 mm
Olema	2015	5	8.8 g	41 mm

Olema	2016	15	11.0 g	40 mm
Olema	2017	9	12.4 g	51 mm

Table 1. Observed average weight and fork length gain in coho juveniles tagged during the summer surveys and later recaptured during spring smolt surveys.

Other Species

Other fish species captured this season included California roach, stickleback, sculpin, bluegill, and a golden shiner.

For More Information

To learn more about this program, contact:

[Michael Reichmuth \(https://www.nps.gov/common/utilities/sendmail/sendemail.cfm?o=468CD8B39CD6A38386BE1AACF11ABEB94EBD489F4FF88B9049&r=/articles/2017-smolt-trapping-summary.htm\)](https://www.nps.gov/common/utilities/sendmail/sendemail.cfm?o=468CD8B39CD6A38386BE1AACF11ABEB94EBD489F4FF88B9049&r=/articles/2017-smolt-trapping-summary.htm)

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