

Article

Return of the Coho! 2024-2025 Spawner Surveys Exceed Expectations

[Golden Gate National Recreation Area](#), [Muir Woods National Monument](#), [Point Reyes National Seashore](#)

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A group of spawning coho on a redd in Redwood Creek.

NPS / Point Reyes National Seashore Association / Gillian Campbell

For the past three months, as we all moved about our daily lives checking the weather and eyeing flooded creeks, hundreds of coho salmon flooded home into local watersheds. As

the San Francisco Bay Area Network coho and steelhead monitoring crew wraps up the spawner season, we are looking back at one of the busiest winters since the beginning of this monitoring program!

This winter we observed increased spawning in all three creeks we monitor—Olema, Pine Gulch, and Redwood Creeks. Olema took the cake with the strongest cohort of all. The season began early on around December 1st, when storms caused Olema flows to rise high enough for more than 50 coho adults to swim up. It also lasted unusually long, with new coho redds (salmon nests) still being found in Olema through mid-February. Read on to hear about what it's like on a spawner survey and for more details on each of the creeks!



Hundreds of coho salmon flooded home into local watersheds this winter to spawn.

NPS / Watershed Stewards Program / Val Kostelnik

Spawner surveys consist of hiking up designated reaches of stream to find any live fish, carcasses, or redds (fish nests). When we find a fish, we document information like location, species, length, and sex. For redds, we record its size and relative age. Redds are typically created by adult coho at the tops of riffle habitat, so eggs receive sufficient oxygen. Coho redds are usually larger and have messier edges than steelhead redds. Since coho salmon are semelparous, meaning their reproductive strategy is to spawn once before death, we also find dead adult salmon this time of year.

In mid-January, just past the peak of spawning, Olema Creek became a veritable cornucopia of large salmon carcasses! Normally pristine sandbars were torn up and covered in the tracks of animals joining the feast. We saw otter, raccoon, coyote, bobcat, and possibly mountain lion tracks along the stream. For us, it meant long, smelly days cutting open week-old carcasses, but also a treasure trove of physical and genetic data.



SIP intern Brooke Harvey scanning a male coho carcass for a PIT tag.

NPS / Point Reyes National Seashore Association / Brentley McNeill

When we come across a carcass, we collect samples including tissue from the operculum (gill cover), scales, and otoliths (inner ear bone of a fish). We send these samples to partner researchers in the University of California system and the California Department of Fish and Wildlife. The carcass information the researchers extract can tell us how old fish are when spawning and even a bit about ocean conditions, which can inform statewide species recovery work.



Coho redd on Olema Creek. See if you can spot the pit and tail-spill.

NPS / Watershed Stewards Program / Val Kostelnik

Olema Creek

This year on Olema we found over 200 confirmed coho redds. For context, the highest coho redd count we ever recorded was during the winter of 2004-2005 when we tallied 137 coho redds. Coho salmon are on a three-year cycle, so the adults that returned this winter emerged from redds laid in 2021-2022. We call each generation of salmon a cohort, and these cohorts act as mostly independent populations. So we could have a lot of salmon one year followed by very few, if one cohort is doing better than the next. That also means the winter of 2027-28 could be another incredible year, as the fry (baby salmon) laid this year return!

For more perspective on this season's impressive numbers, we can look back to the last time this cohort was seen as adults in Olema Creek in 2021-2022. Then, we found around 70 confirmed coho redds, only a third of the number we found this season. Although separated by cohort, this is a really encouraging sign of species recovery. We hope to see the same trend for next year's returning adults. In addition to coho, we also found two

Chinook salmon carcasses indicating that once again Chinook have spawned in Olema Creek. The steelhead spawning season is now in full swing and so far their numbers look much better than last year.

Redwood Creek

We confirmed over 30 coho redds this season in Redwood Creek. That's a relatively low number considering recent hatchery stocking and habitat enhancements, but we hope to see high fry survival over the spring. We're also expecting a larger-than-average smolt outmigration, since juveniles from Warm Springs Hatchery were just released into Redwood in December.

Some of our most interesting observations on Redwood this season were of three live Chinook and four Chinook carcasses in late November. This marks the third time in the last five years that we have observed Chinook in Redwood Creek. Prior to that we have found no record of Chinook in this small coastal watershed. These Chinook were very likely strays from the Sacramento-San Joaquin River System, and we aren't sure if any of these fish successfully spawned this year.

We also started seeing steelhead in Redwood Creek starting in January. On a day in mid-January, our team counted 14 live adults in the system. Hopefully the steelhead keep on coming as we continue through our wet season. Steelhead are iteroparous, meaning they can reproduce multiple times during their lifetime. They can spawn and return to the ocean, making them tougher to spot on a survey. Their redds are also more difficult to identify.



Coho spawners venturing through Muir Woods. We confirmed over 30 coho redds this season in Redwood Creek.

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Pine Gulch Creek

Pine Gulch Creek, which flows south into Bolinas Lagoon, also had a large salmon run this season. We've documented almost 30 redds so far, though we don't know the species for most. However, we did count three coho carcass which suggests that some of the redds that we counted were made by coho. We commonly confirm species later by identifying fry or juveniles near redd locations, or by correlating redd locations with nearby live adults and carcasses.

There were no salmon found in Pine Gulch in the 1980s and 1990s, until a few spawners turned up in 2001. Despite this fresh hope, no coho and only a few steelhead were seen for most of the 2010s. We finally confirmed another coho redd in 2021-2022, when this year's cohort was born. The apparent success of this year means that if the fish incubating this winter survive to adulthood, we could have another banner year for salmon in Pine Gulch in 2027-28.



Collecting otoliths from a coho carcass on Olema Creek. Our partners analyze these inner ear structures to learn about the salmon's age and environment.

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In Summary

Overall, this spawner season has given us a large amount of data on this coho cohort. It's been encouraging across the board to see signs of recovery for this federally endangered Central California Coast coho population. We'd like to thank everyone who came out to volunteer with us, and the public for their continued interest and support. Stay tuned this spring to hear about our smolt-trapping operations and outmigrant estimates for Olema and Redwood Creeks!

For more information

- San Francisco Bay Area Network [Salmonid Monitoring webpage](#)
- Pacific Coast Science & Learning Center [Coho & Steelhead webpage](#)
 - [San Francisco Bay Area Coho and Steelhead Blog](#)

- Contact Fishery Biologist [Michael Reichmuth](#)