2009-2010 Coho and Steelhead Spawner Survey Summary

© Richard James, 2009.
Above a male coho salmon is in search of a female coho on Lagunitas Creek.

Volunteer Opportunities!

Although our spawner season has come to a close, there are still ample opportunities to participate in the monitoring and restoration of the coho and steelhead of West Marin. Smolt trap operations will begin in late March, 2010 and last for approximately three months. Smolt trapping is an excellent opportunity to monitor and handle a wide variety of aquatic species including coho salmon, steelhead, stickleback, sculpin, salamanders…and a whole lot more.

End of the Season Spawner Summary

A big thanks to all of our volunteers who participated in the 2009-2010 Coho and Steelhead Spawner Surveys. Through their dedication and flexibility, we were able to successfully complete all of our spawner surveys.

2009-2010 Spawner Season Highlights
This season represents the sixth returning year class of spawning coho salmon since monitoring began in 1994-1995 in Olema Creek. Coho salmon have a three year life cycle, resulting in distinct year classes. Each year class or cohort can be tracked over time to determine annual fluctuations, impacts, and population trends. The 2009-2010 year class was smaller on all three monitored watersheds when compared to the last time that we observed this cohort during the winter of 2006-2007.

Average rainfall amounts this season were normal and considered sufficient for bringing coho into the creeks. Throughout the 2009-2010 season, we conducted 18 surveys on Olema Creek, and 9 surveys on Redwood Creek. Our first comprehensive surveys on Olema Creek and Redwood Creek were conducted following a storm in late November. Pine Gulch and Cheda Creek were first surveyed in early December. No redds or fish were observed during the survey

period. Throughout the months of December and January, conditions were favorable for spawning activity and monitoring was conducted consistently. Water visibility during our surveys was adequate, with the exception of surveys following the more significant storms in mid December and mid January on Olema Creek.

Following a storm in the third week of December, we began to observe coho spawners on Olema, Redwood, and John West Fork Creek. We continued seeing spawners well into January. Our last round of surveys on Redwood Creek, Olema Creek, and Pine Gulch Creek were conducted in mid February. Cheda Creek was last surveyed in late January. No coho spawning was observed on Pine Gulch or Cheda Creek and no new coho spawning activity was observed on Redwood and Olema Creeks. Three additional tributaries to the Olema mainstem (Boundary Gulch, Horse Camp Creek, and Giacomini Creek) were surveyed between December and January. No adult spawners were observed in any of the tributaries surveyed.

Results

Based on smolt production estimates in the spring of 2008, the return rate for spawners this season was lower than the expected 4-6%. This year, preliminary data show that the return rate for Olema Creek including John West Fork was just over 1%. The return rate on Redwood Creek was almost 2%. A substantial decline in coho spawning activity for this year class was observed on both a local and regional scale, with spawner numbers on nearby Lagunitas Creek lower than expected as well.

Olema Creek mainstem, a tributary to Lagunitas Creek, experienced an 80% decline in coho redds for this year class from 2006-2007. Efficiency was relatively high with comprehensive surveys conducted nearly every week, so we do not attribute low survey efficiency as a main factor in the low number of spawners observed. Throughout the season, we observed a total of 20 live adult coho, and 6 carcasses on Olema Creek. John West Fork, a tributary to Olema Creek, also showed a dramatic decline of around 90% in total redd production from the 2006-2007 year class with only 3 observed redds, 6 live adult coho, and 0 carcasses (Table 1).

Table 1. Olema Creek Mainstem and John West Fork coho salmon spawner survey information for 1994-1995 through 2009-2010.

Year	Number of Surveys	Total Redds
2009-2010	18	14
2006-2007	6	99
2003-2004	6	109
2000-2001	4	134
1997-1998	8	133
1994-1995*	3	9

*Does not include John West Fork.

Redwood Creek mainstem had relatively stable spawning activity when compared to the 2006-2007 cohort. Throughout the season, we observed 21 live adult coho and 10 carcasses (Table 2).

Table 2. Redwood Creek coho salmon spawner survey results for 1997-1998 through 2009-2010.

Year	Number of Surveys	Total Redds
2009-2010	9	23
2006-2007	9	24
2003-2004	6	43
2000-2001	5	35
1997-1998	7	80

Cheda Creek is a major tributary to Lagunitas Creek in which coho spawning is typically observed. This season we observed no returning adult coho to Cheda Creek (Table 3). However, being that this is a smaller watershed, access is limited to high flow conditions.

Table 3. Cheda Creek coho salmon spawner survey results for 2000-2001 through 2009-2010.

Year	Number of Surveys	Total Redds
2009-2010	3	0
2006-2007	3	9
2003-2004	3	6
2000-2001	2	0

Monitoring of Pine Gulch was initiated by the discovery of one adult coho salmon during the 2000-2001 spawner season. During the 2003-2004, 2006-2007 and 2009-2010 surveys, no live adult coho, or coho redds were observed. Since we were only able to survey Pine Gulch Creek 4 times this season, the absence in coho spawners may be attributed to low survey efficiency.

In conjunction with University of California Department of Environmental Science, Policy and Management, this 2009-2010 spawner season included the collection of otoliths from coho carcasses. Otoliths are similar to the human inner ear bone, and are housed in the brain cavity of fish. These pieces of calcium carbonate, about 3mm in length, record a wealth of data on the life history of a fish including: species, age, time of ocean entry, etc. There are also chemical signatures that are recorded in the otoliths that can inform us on the natal stream of a salmon. This season, we were able to collect otoliths from 1 coho carcass on Redwood Creek and 2 coho carcasses on Olema Creek. These otoliths were sent to UC Berkeley researchers for analysis. The data gathered from these analyses may provide more insight into the differing adult return rates for Redwood Creek and Olema Creek, such as timing of ocean entry.

Volunteer Opportunities:
We are currently looking for volunteers to support us with our upcoming smolt trap operations. In particular, there is currently a need for assistance on Saturdays and Sundays.

For more information about our surveys: contact michael_reichmuth@nps.gov or call 415-464-5191.

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