



## 2007-2008 Coho and Steelhead Spawner Survey Summary



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Roe from a large unspawned female steelhead carcass recovered in Muir Woods National Monument, Redwood Creek Jan. 2008.

Photo Taken by Richard James

### 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, 2008 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 2007-2008 Coho and Steelhead Spawner Surveys. Through their dedication and flexibility, we were able to successfully complete all our spawner surveys.

#### 2007-2008 Spawner Season:

Female adult coho salmon are 3 years old when they return to spawn. As a result, every three years represents a distinct year class depicting population fluctuations and impacts from the previous year classes. Comparisons can then be made between each year class. From our observations, the 2007-2008 coho salmon year class has seen a drastic decline in the number of returning adults that were seen 3 years ago in the 2004-2005 season. The Olema Creek watershed total redd production for this year class declined by 80% from the 2004-2005 year class. The most drastic decline was observed in Redwood Creek where no coho redds or live fish were observed, marking a complete failure of the year class.

Our first surveys were conducted on November 28<sup>th</sup> and 29<sup>th</sup>, on Redwood and Olema Creeks respectively. With around an inch of rainfall for the entire month of November no coho redds or fish were observed at this time. On December 4<sup>th</sup> Bear Valley received 1.03 inches of rain. Coho salmon were observed while park staff were performing water quality monitoring in the lower

reach of Olema Creek and a spawner survey was completed on December 5th on the first two reaches. Five adult coho spawners, 4 definite coho redds, and 3 new or test redds were observed in reach 1. Redwood Creek was surveyed on December 10<sup>th</sup>, with no coho redds or fish observed. Bear Valley received 1.2 inches of rain between Dec. 6<sup>th</sup> and 7<sup>th</sup>, followed by 1.9 inches of rain between Dec. 14<sup>th</sup> and 19<sup>th</sup>. Spawners were observed in the Olema mainstem but flows remained low in the tributaries where no spawners were observed as well as no spawning activity in Redwood Creek.

Between January 3<sup>rd</sup> and January 6<sup>th</sup>, 5.04 inches of rain was recorded at the Bear Valley rain gauge, more than enough water to allow fish access to spawning habitat in these systems. Redwood Creek was surveyed on January 11<sup>th</sup> and still no evidence of adult coho or redds were observed. Although coho numbers remained dismal, steelhead spawning activity was observed in both the mainstem of Redwood and Olema Creeks and in the upper reaches of Fern Creek, a tributary to Redwood Creek. The first sightings of Steelhead spawning activity began on December 31<sup>st</sup> on Redwood Creek, and January 14<sup>th</sup> on Olema Creek

Our last round of surveys were conducted on February 7<sup>th</sup> and 8<sup>th</sup> on Redwood and Olema Creek respectively. No new coho spawning activity was observed ending the season with a never before seen zero returning coho adults to Redwood Creek.

### **Results:**

A major decline in coho numbers were observed in all monitored watersheds during the 2007-2008 spawner season. Similar observations were also made on both a local and regional scale. Declines in coho numbers were recorded along the entire California coast for this year class. Poor ocean conditions are likely the cause of the low returns. During the 2006 coho smolt outmigration observed ocean conditions remained unfavorable with above average ocean temperatures and a lack in coastal upwelling.

Below are the Peak Live Plus Cumulative Dead (PLD) Indexes, Area Under the Curve (AUC) estimates and total redds for this coho year class in monitored streams. The PLD index provides a minimum count of fish within a watershed and is a way to avoid double counting fish during repeated surveys. It is derived from adding the peak number of live fish observed during a single survey to the total number of carcasses recovered prior to that survey. The AUC estimate allows for population estimates based on observed adult live fish, their resident time (RT), and observer efficiency (OE).

Olema Creek Mainstem experienced a 80% decline in coho redds for this year class from 2004-2005. AUC estimates for Olema Creek ranged from 18 to 78 adult spawners depending on residence time and observer efficiency. Based on survey observations and water clarity throughout the sampling period, a residence time of 8 to 10 days and a 70% to 80% observer efficiency was used to calculate an AUC range of 39 to 55 adult spawners. The PLD index provided a lower estimate with only 24 adult spawners. In general the PLD index should be used as a minimum estimate of escapement.

**Olema Creek Mainstem coho salmon spawner survey information for 1995-1996 through 2007-2008.**

Year	Number of Surveys	AUC Range 100% OE RT 8-17 days	AUC Range 50% OE RT 8-17 days	PLD Index	Total Redds
2007-2008	8	18-39	37-78	24*	17
2004-2005	6	149-316	298-632	184	92
2001-2002	4	105-224	210-447	90	58
1998-1999	6	25-53	49-105	42	42
1995-1996	2	--	--	106	--

John West Fork, a tributary to Olema Creek, also showed a dramatic decline of around 80% in total redd production from the 2004-2005 year class with only 8 observed redds and a PLD index of 11 adult coho.

**John West Fork coho salmon spawner survey results for 1998-1999 through 2007-2008.**

Year	Number of Surveys	AUC Range 100% OE RT 8-17 days	AUC Range 50% OE RT 8-17 days	PLD Index	Total Redds
2007-2008	6	3-7	6-12	11	8
2004-2005	7	60-127	120-255	86	45
2001-2002	6	25-53	50-107	20	31
1998-1999	2	--	--	9	1

Redwood Creek Mainstem had the lowest coho spawning activity ever recorded. There were no observations of coho redds or returning adult spawners. Our summer monitoring efforts will be extremely important to verify that no adult spawners returned to Redwood Creek this season.

**Redwood Creek coho salmon spawner survey results for 1998-1999 through 2007-2008.**

Year	Number of Surveys	AUC Range 100% OE RT 8-17 days	AUC Range 50% OE RT 8-17 days	PLD Index	Total Redds
2007-2008	7	-	-	0	0
2004-2005	7	169-359	338-718	171	74
2001-2002	5	116-247	233-494	105	29
1998-1999	11	39-83	78-167	39	55

\*Includes peaks 22 days apart on Dec. 23 and Jan. 14.

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.

**Cheda Creek coho salmon spawner survey results for 1998-1999 through 2007-2008**

Year	Number of Surveys	AUC Range 100% OE RT 8-17 days	AUC Range 50% OE RT 8-17 days	PLD Index	Total Redds
2007-2008	3	-	-	0	0
2004-2005	5	-	-	17	6
2001-2002	5	-	-	4	3
1998-1999	2	-	-	0	0

Monitoring of Pine Gulch was initiated by the discovery of one adult coho salmon during the 2000-2001 spawner season. Since monitoring was initiated, the highest number of adult spawners were observed during the 2004-2005 year class in which three adults and three redds were observed. Although this season did not match the 2004-2005 season, one coho and two redds were observed thus marking the return of this year class to the Pine Gulch watershed for the third consecutive time.

**Pine Gulch coho salmon spawner survey results for 1998-1999 through 2007-2008**

Year	Number of Surveys	AUC Range 100% OE RT 8-17 days	AUC Range 50% OE RT 8-17 days	PLD Index	Total Redds
2007-2008	3	-	-	1	2
2004-2005	3	-	-	3	3
2001-2002	2	-	-	2	2

**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](mailto:michael_reichmuth@nps.gov) or call 415-464-5191.

