Institute for Conservation Advocacy Research and Education

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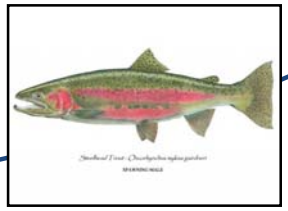
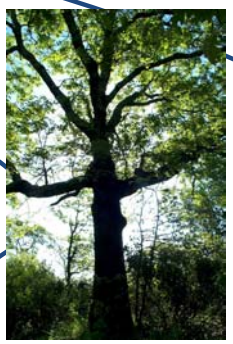
Suscol Creek Collaborative Partnership and Restoration Project

Final Report 2009





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Summary

This, our sixth year, of surveying the steelhead in Suscol Creek, a sub-watershed of the Napa River, was the most unusual to date. We did not observe a single young-of-the-year (YOY) steelhead between the middle bridge (below the Farm House on Silverado Suscol property) and the top of the pond. There were age 1 and 2 steelhead present. Normally that reach has a significant number of steelhead of all ages.

The water year 2009 (from October to September) was a dry year when compared with the past 90 years of record from the recording station at the Napa State Hospital. The average precipitation for the water year was 19.55 inches, which is about 20% less than the long-term average. This water year was slightly drier than the year before. The only month that was above average was February, which had over 9 inches of rainfall for the month. The high precipitation in February might account for the absence of steelhead in the middle reach of Suscol Creek (*see map 1; between long-term study stream reach & upper Suscol Creek stream reach*).

We conducted our usual June survey of the Suscol Creek watershed. No steelhead was observed below the highway bridge. In our long-term study stream reach (*see map 1*) we observed: 116 age 0 steelhead, 12 age 1+ steelhead, and 11 age 2+ steelhead. In addition no centrarchids were

observed this year which was the same as last year. The fish screen placed on the outlet of the reservoir is working to keep centrarchids from entering the creek. The number of age 0 steelhead was significantly below the average for the last five years. The number of age 1 and 2 steelhead was lower than the observed averages over the last five years. Curiously, the age 1 steelhead were slightly more numerous (12 vs. 8) in the long-term study of the stream reach than the year before, while the age 2 steelhead were slightly less numerous than the year before (11 vs. 15).

We continued the analysis of the life histories of steelhead in the long-term study reach of Suscol Creek, which provides the most sensitive tool for tracking the steelhead population over time. The 2004 cohort (generation) has a survival rate of about 50% each year to age 2. This represents an excellent survival rate. The survival rates have been significantly lower during the last couple of years probably because of the lower than average stream flows. The age 2 steelhead has declined steadily from 27 in 2006 to 11 in 2009.

This is also the second year that we completed a survey of upper Suscol Creek (*see map 1*) including the 2 forks. The YOY steelhead was significantly less than the previous year in this stream reach as well. Age 1 steelhead was more numerous than the year before (105 vs. 87). Age 2

steelhead was reduced from the previous year (19 vs. 23). The same pattern was observed in both forks of upper Suscol Creek.

Introduction

The 2008-09 Water Year

The water year from October 2008 to September 2009 was a drier than average year based on the 90 year record from the Napa State Hospital. The average precipitation is normally about 24.8 inches per year. During the current water year only 19.55 inches were observed (*figure 1, table 1*). This is 80% of the long-term average. Only February had a higher than average monthly precipitation (*see table 1, figure 1*). Over 9 inches of rainfall were recorded in February, which is more than twice the long-term average for the month.

This is the third year in a row with less than average annual precipitation. The 2007 water year was a severe drought year: annual precipitation was only 15.2 inches or 61% of average precipitation. The last two years have received about 80% of normal precipitation.

The Suscol Creek Steelhead Population

Long-term Study Stream Reach

We conducted our annual June survey beginning above the spray fields of Napa Sanitation (*see map 1*). No steelhead was observed below the highway 29 bridge. In our long term study stream reach we snorkeled every pool (unless covered by duckweed) and every 8th glide and 10th riffle. In our long term study stream reach we observed: 116 YOY steelhead, 12 age 1+, and 11 age 2+ steelhead. The number of YOY steelhead was below average for the last six years (*see table 2*). In fact it was about equal to the lowest counts that we have observed (2004). Curiously, no YOY steelhead were observed in the stream reach between the middle bridge and the top of the pond. Usually YOY steelhead are numerous in this reach. Redd (nests) were probably scoured out during the February storms. The number of age 1 steelhead was slightly higher than the year before while age 2 steelhead was lower than the observed averages over the last five years. In fact, 2009 had the lowest number of age 2 fish that we have observed over the last six years.

Upper Suscol

This was the second year that we surveyed upper Suscol Creek (*see map 1*). In this stream reach we snorkeled every 5th pool, 8th glide, and 10th riffle. There was steelhead all the way to the forks and up both forks.

Steelhead were not found as high up the forks as they were the previous year. In upper Suscol Creek there were 210 age 0 steelhead, 105 age 1, and 19-age 2 steelhead (*see table 2*). The right fork had 4 YOY steelhead, while the left fork had no YOY steelhead. This is a similar pattern to what we observed in the lower stream reach, i.e. steelhead (YOY) and age 2 fish were fewer than previously observed. Age 1 steelhead was slightly more numerous than the previous year.

Life-history Analysis

The survival of steelhead during the 2009 water year was less than average probably because of the lower stream flow during the summer months. YOY steelhead (in 2008) declined from 393 to 12 age 1+ during the present (meaning 2009) year (*see table 3*). This is significantly lower survival than we have seen before only at about 3%. The survival of age 1 and 2 fish was also below average. However, there were more age 2 fish in the stream reach than there were age 1 fish the year before (8 vs. 12). This is usually the result of downstream migration of fish as they get bigger.

It appears that the number of age 0 steelhead varies considerably from year to year (*see table 3, figure 2*). It is likely that the number of age 0 steelhead depends on the number of steelhead spawning and the number and

size of storms after the steelhead have spawned (most likely in January to March). The survival of age 0+ to age 1+ steelhead during the last three years has been lower than average. In all three years it has resulted in less than 30 age 1+ steelhead surviving to the following June. With a large number of age 0 fish and a high water year there were over 100 age 1+ steelhead in water year 2005. This illustrates the role of high summer flows in maintaining good numbers of steelhead.

The number of age 2+ steelhead has varied from 11-25 over the last 4 years. It appears that the number of age-2 steelhead has declined through these 3 years of drought from about 27 to about 12 fish. These trends are similar to the trends of steelhead observed throughout the West.

Macro-invertebrates

In March 2010, we collected 5 macro-invertebrate samples along the long profile of Suscol Creek (*see map 2*). We collected the samples working upstream: lower bridge near the highway, middle bridge, fence-line boundary, stream crossing, just below the forks. At each site we collected 8 square feet of substrate. The Surber samples were combined into a composite. A total of 500 organisms were counted from each sample. This

has been our standard collecting technique since the late 1990's in the Napa basin.

Site #1, the lowest site near the highway bridge, had a total taxa count of 36 and a total EPT (mayflies, stoneflies, and Caddisflies) taxa count of 14. This is about average for a site on the east side of the Napa Valley, but substantially lower than the survey total we observed in the early 2000's.

Site #2 is just above the bridge in our normal long-term study reach. We collected a total of 30 taxa and 14 EPT taxa. These totals are significantly less than the numbers we observed during the early 2000's.

Site #3 is at the fence-line marking the boundary between the two properties. Here we collected 47 total taxa and 23 EPT taxa. This was about the average that we observed in Suscol Creek during the early 2000's.

Site #4 is adjacent to a stream crossing that has been used by ATV's and cattle. It is about 200 yards above the major cattle crossing just above the boundary between the two properties. We collected 41 total taxa at this site and 20 EPT. That is about average for a site impacted by cattle and equipment crossing.

Site #5 is between site #4 and the forks. It is located in a canyon with a mature Riparian zone. We collected 48 total taxa and 21 EPT. The

observed values were approximately equal to those that we collected in the early 2000's.

It is likely that the reduced number of total taxa is due to the lower than average low-flows during the last 3 years and the peak flows of the last several years. The number of YOY steelhead was lower than average and they were absent from a reach they are usually common. This was also the reach that had the lowest number of invertebrate taxa. The numbers of age 1 and 2 steelhead were near normal in the reach, ruling out a number of other possible factors.

Summary

The population of steelhead in Suscol Creek is large enough to be sustaining, except during an extended period of severe drought. A total of 330 age-0 (YOY) steelhead, 147 age-1+, and 30 age 2+ were observed in Suscol Creek during the 2009 surveys. This is about one-third of the YOY steelhead observed in the previous year, 132% of age 1 from the previous year, and 68% of age 2 steelhead from the previous year. After 3 years of droughts the steelhead population in Suscol Creek has been reduced but the fish are highly resilient to these environmental fluctuations.

Suscol 2010

During the 2010 season we would like to: continue our June snorkel survey including the upper reaches, work on restoration efforts on the upper property, especially Blackberry removal, and continue to collect stream flow and temperature records.