



Morro Bay Volunteer Monitoring Program

Stream Profiling Update

Winter 2004

Background

The Morro Bay Volunteer Monitoring Program (VMP) has been conducting stream profiling on local creeks since the summer of 2001.

Volunteers venture out to 19 creek sites each summer. They use basic surveying equipment to plot cross-sectional profiles of the creek beds. By comparing these profiles from year to year, we get an idea of changes in the creek geomorphology including erosion and deposition.

Monitoring Sites

The monitoring sites are distributed throughout the watershed with five on upper Chorro Creek (above the California Mens Colony), six on Dairy Creek, five on Pennington Creek, and three on lower Chorro Creek (below Twin Bridges).

Each site is permanently marked with rebar so that the exact same profile can be measured each year. These sites were historically monitored by the RWQCB.

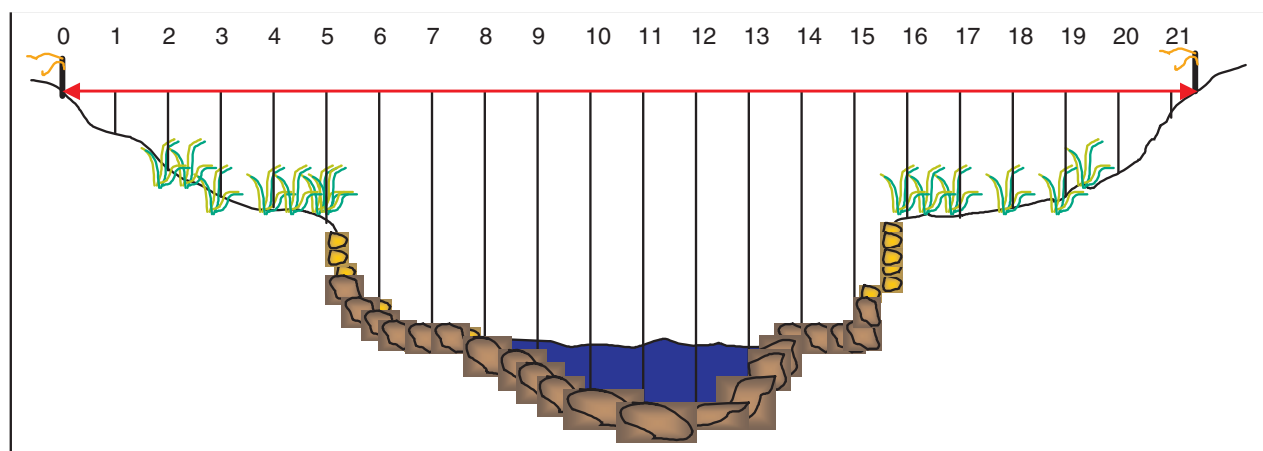
How does the VMP collect stream profiling data?

The stream profiles are collected each summer during the dry season. This is assumed to be a stable time of year for the creeks since high flow from storms are not impacting the creek.

Each of the 19 sites is marked with rebar, PVC pipe and flagging. To collect the data, volunteers first locate the site, which can be challenging due to dense vegetation, changes in the appearance of the site due to storm events, damage to the benchmarkers, etc. A handheld GPS unit is helpful in locating the sites.

At the site, the volunteers stretch a tape measure from one benchmark to the other. They set up a tripod and level. Elevation readings are taken at one foot intervals along the cross section. The diagram below shows a creek cross section taken at one foot intervals. Other data such as bankfull width, floodplain width and water surface slope are also collected.

Monitoring takes from one to three hours per site, depending on site access.

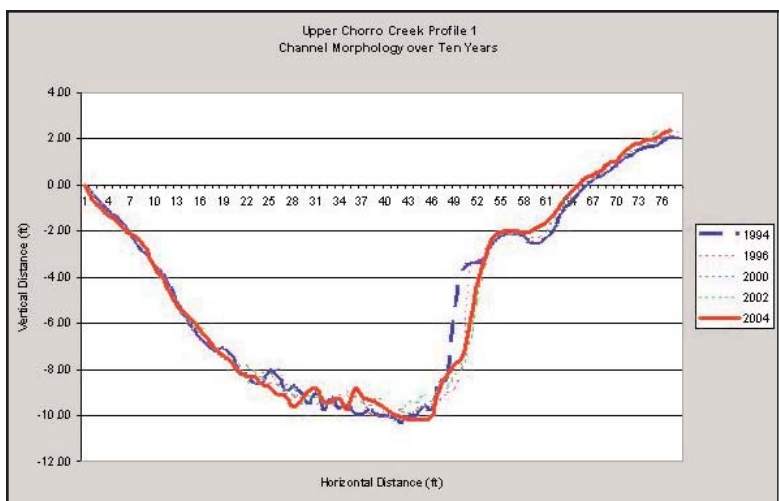


Overview of Morro Bay Profiling Data: 1994 to 2004

From the basic surveying data, we create a cross-sectional profile of the creek. If you're standing in the creek bed looking downstream, the lines in the plots represent the bottom and sides of the creek bed.

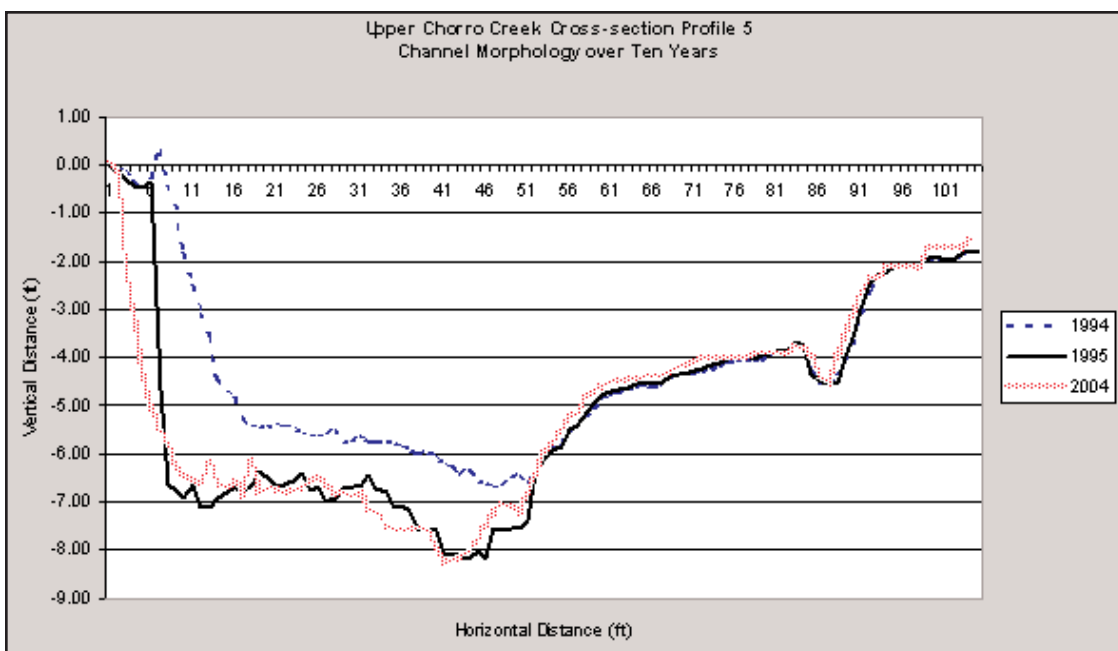
In addition to the VMP's four years of surveying, the RWQCB has several years of data from these sites. In comparing the profiles for previous years, we found that most of the sites were relatively stable.

The following plot of Upper Chorro Creek shows that from 1994 through 2004, there has been relatively little change in the creek bed and banks. This stability was also apparent for



most of the sites on lower Chorro, Pennington and Dairy Creeks.

In general, only one site from each of the locations surveyed so far this year (upper Chorro, Pennington, and Dairy) shows notable change since the cross section sites were established. We've highlighted these three cross sections here.



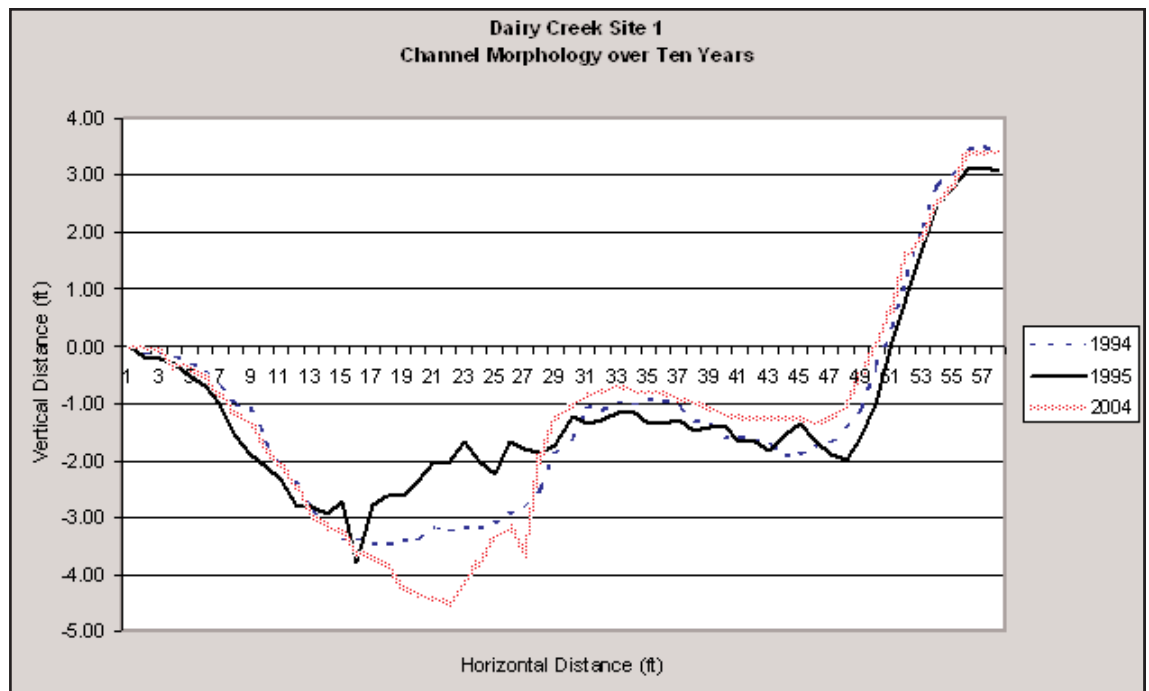
The following plot is for upper Chorro, the branch up

above the California Men's Colony on Camp SLO property. Profile #5 is the lowest profile in the watershed on that branch of the creek. During the intervening ten years, the left bank was cut back approximately four feet, while the bed degraded by approximately one foot. Annual surveys show that the majority of this erosion occurred between the 1994 and 1995 surveys, and that there has been relatively little change in the bank since 1995. The major changes in the 1994-5 season are likely due to

the Highway 41 fire in the upper watershed followed by heavy winter rains. There has been little change since. This is likely due to the fact that the flow is not directly concentrated against the toe of the bank, and an increasing amount of vegetation at the toe of this bank (specifically an incredible number of sycamore saplings) continues to add protection. It appears that only flows exceeding bankfull are likely to cause further erosion on this bank.

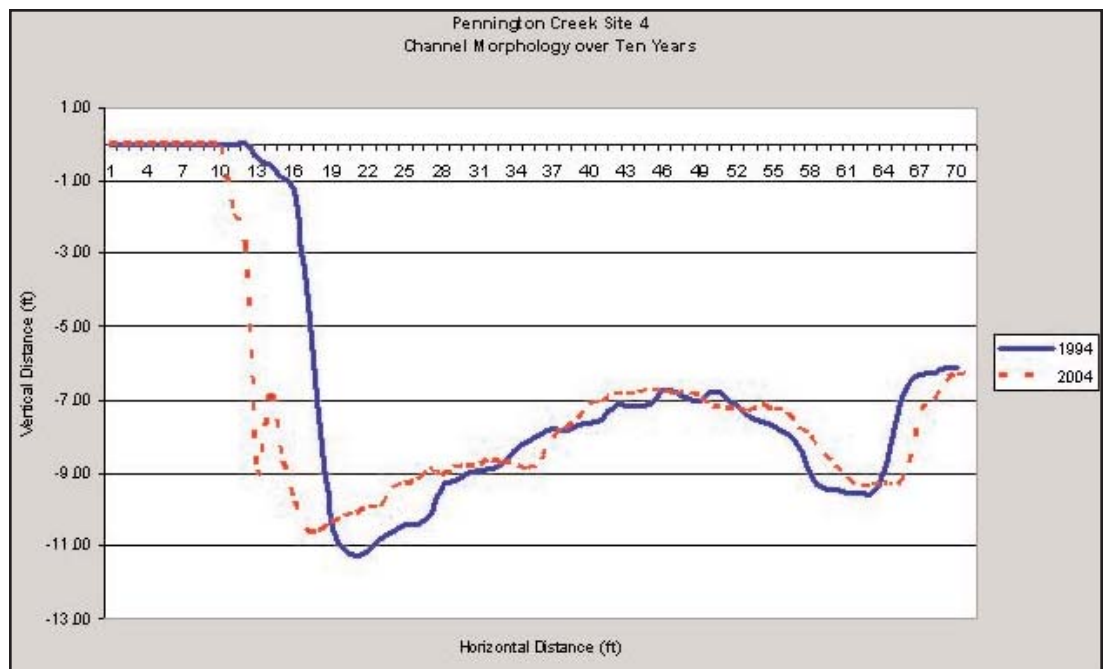
While the Chorro site exhibited signs of degradation subsequent to the Highway 41 fire, Dairy Creek shows just the opposite. In 1995, we see aggradation or deposition of sediment leading to a raising of the creek bed elevation at the cross-section.

Over time, the deposited material is moved further downstream and a return to the pre-1994 elevation is reached.



All of the Dairy Creek sites are within the cattle exclusion fencing on the creek.

This last plot is from Pennington Creek, profile #4 which is the next to lowest transect along Pennington Creek. This site has a huge cut-bank on the left side of the channel that is approximately 10 feet high. Over the past ten years it has cut back about six feet at the top and two feet at the bottom. With a transition from a nearly vertical bank in 1993 to one with a 2:1 slope in 2004, it appears to be evolving toward a bank with some increased stability. However, unlike the cut-bank in the profile on Chorro Creek, flow is concentrated on the left side of the channel at the toe of this bank, and there is little to no protective vegetation. Annual surveys show that some portion of the bank has



eroded every year between 1993 and 2004 so it is very likely that it will continue to be destabilized and cut back by even moderate storm flows. Since 1993 there has also been an obvious degradation of what is essentially a midchannel bar between the main channel on the left and an alternate channel on the right, as well as erosion of the far right bank.

Thank You to the VMP's Profiling Volunteers!

Many volunteers have given their time to help collect this data which addresses sedimentation, one of the most serious threats to the Morro Bay estuary.

Bob Croyle
Jim DaRoss
Michelle Giolli
Drew Loganbill

This is challenging work, as sites can be difficult to find or require bushwhacking to locate. We are very grateful to the volunteers who donated their time and braved the poison oak and ticks to help us continue this valuable data set.