

Final Report

Dixie Creek Restoration Project

Funded by Plumas Watershed Forum

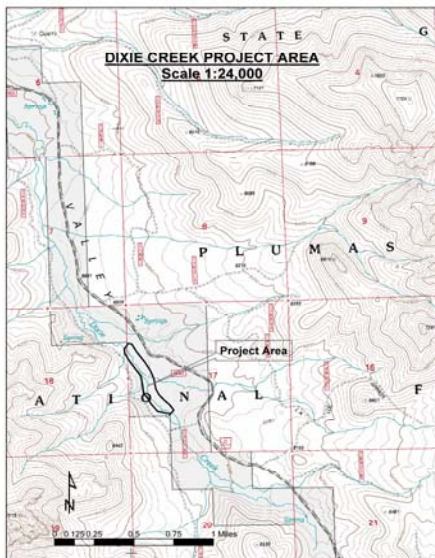


**Plumas Corporation
January 2009**

Background

FR-CRM staff presented this project to the Dixie Valley Landowners Association in the summer of 2004. The FR-CRM was approached by the landowner at that time, Bill Maple, to address erosion concerns on his property, after his own attempts with rock treatments had little success. The main systemic headcut that has been moving headward from Red Clover Valley since the 1950's was located on the Maples property, transforming a 1.5 foot deep channel into a 10 foot deep gully. The active headcutting was also drying out the meadow, and degrading downstream water quality and trout habitat with silt. The FR-CRM agreed to work with the landowner to treat the problem. Surveying, design and environmental work was completed under a Forum-funded project development and monitoring grant awarded to the FR-CRM via Plumas Corporation in 2004. Subsequently, Plumas Corporation applied to the Plumas Watershed Forum in 2006, and was awarded our full request of \$56,000 for final design and implementation of a pond & plug treatment of Dixie Creek on the Maple property.

Figure 1. Project Location.



The project is located in T.24N. R.15E. Sec. 17.

The stated goal of the project was to restore the full function of the floodplain/channel system by eliminating the gully and returning the channel to the elevation of the floodplain. Implementation was expected to result in restored floodplain function, i.e. attenuated flood flows, increased summer flows, and improved water quality and riparian area ecosystem productivity. The project was also expected to serve as a restoration demonstration to the numerous small parcel landowners along the degraded channel in this 4.5 mile long valley.

Project Description

The project restored 2,000 feet of Dixie Creek in Dixie Valley, a major tributary to Red Clover Creek, using the pond and plug technique. The project was anchored at a natural valley constriction at the downstream (north) end of the property with a moderate gradient, rock valley grade structure, using 200 cubic yards of 2-foot minus pit run material from the Beckwourth Ranger District Crocker pit. The project entailed the excavation of eight ponds and with the resultant material used to fill twelve plugs to eliminate the gully. The stream flow that was within the gully was re-directed into an existing remnant channel at the elevation of the meadow, resulting in a defined, continuous channel throughout the length of the project.

Project construction began on September 4, 2007 and was completed on September 14, 2007. Out of five bidders, the construction bid was awarded to Grizzly Creek Excavating for \$32,720. Final construction costs were \$704 over budget. Cost over-runs were likely due to the presence of a FR-CRM staff trainee on the project on the water truck, as well as an underestimate of the

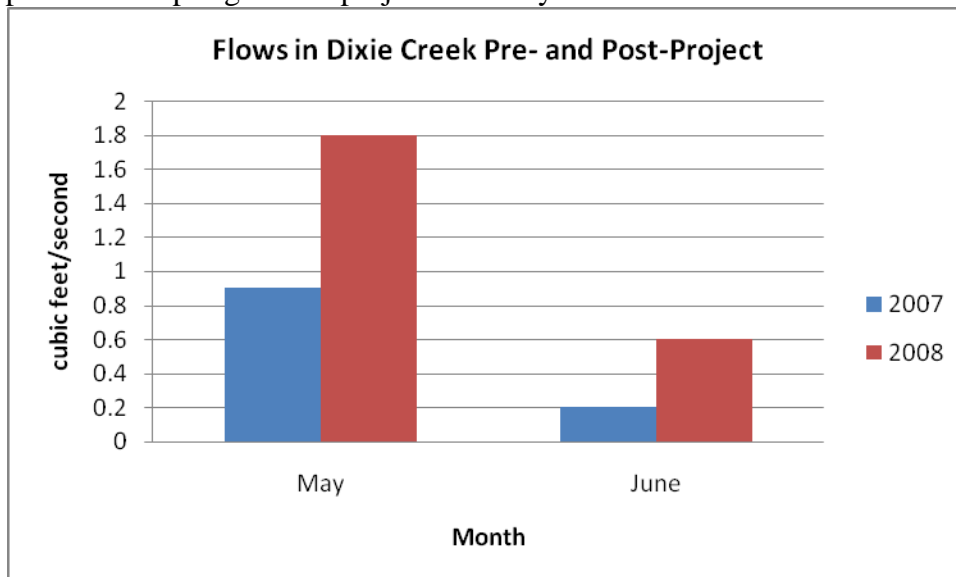
time required for final design, contract administration and monitoring. The Plumas National Forest contributed the rock for the grade control at a value of \$5,000.

Re-vegetation work consisted of removal of top soil and plants to be disturbed. The topsoil was then spread on the completed plugs, and then seeded with native seeds collected in the Last Chance project area. Rooted plants were re-located with heavy equipment on the plugs and other places likely to receive stress from flowing water. Willow slips were planted by the Calif. Conservation Crew in May 2008, and the area was again planted with willow slips and sedges from the Feather River College greenhouse in October 2008. Commercial native seed were also sown in November 2008 on the plugs.

The project area was rested from grazing in 2008, and will continue rest in 2009. Grazing may resume in 2010 depending on vegetative recovery, at the discretion of the Technical Advisory Committee, which includes the landowners, who are now John Swanson and Darcie White.

Did the project meet purposes of the Monterey Settlement?

1) **Improve retention of water for augmented base flow in streams:** Pre- and post-project flows were measured approximately 500 feet downstream of the project area. This location was chosen because it was just below a valley facet, where project-induced subsurface flow improvement was thought to most likely become surface flow. Later season flows were not measured because Dixie Creek was known to dry up. However casual observations indicated that, at least post-project, the channel did not dry up at this location. In May and June, flows more than doubled at this location, even though precipitation was nearly equal between the two years (8.45” in Jun-Jul 2007 Water Year and 8.96” for WY2008 at Frenchman Dam). It should be noted however, that snow was on the ground later into the year in 2008 than 2007, and the presence of springs in the project area may also have had an influence.



2) **Improve water quality and streambank protection:** No water quality data were collected, however, sedimentation was reduced due to elimination of headcuts. Sedimentation from widening vertical raw banks was also eliminated. These outcomes are visible in the following

sets photos. Post-project photos on the left were taken in spring 2008, before the first growing season. Pre-project photos on the right were taken in spring 2006.



3) **Improve upland vegetation management:** No data were collected.

4) **Improve groundwater retention in major aquifers:** While Dixie Valley is not a major aquifer, the data presented under item 1) shows an improvement in the retention and release of groundwater.

Lessons learned

During implementation of the project, Beckwourth District personnel were also implementing a bank stabilization project just downstream of this project. Better coordination between the FR-CRM and Beckwourth District personnel may have led to better integration of these two projects.

Project monitoring could have been improved with flow measurements later into the season, temperature monitoring, and pool tail fine measurements. The monitoring location at a meadow facet below the project area was a good location.

Continued Monitoring

An unsupervised member of the California Conservation Corps dug a ditch from a spring area down to a pond. This action was not likely to improve the project, and may initiate erosion. The small size of the ditch, hopefully, will allow it to naturally revegetate.

A low flow channel drop of approximately one foot into one of the ponds should be monitored for headcutting. Headcutting is not expected because the drop occurs over sedges. Also, a steep riffle occurs in the last channel segment above the grade control. Both areas should be monitored for movement or expansion.

Plug revegetation should be monitored, as well as water dropping over the plugs. A couple of plugs developed minor incisions that should heal themselves as the plugs revegetate. One of the goals of revegetation should be to establish a near-equal moderate vegetative cover over the plugs versus along the new channel, so that overland flows can spread evenly across the floodplain.