

# **Greenhorn Creek Watershed Restoration Project**

**Funded by  
Plumas Resource Advisory Committee  
(Secure Rural Schools and Community Self-Determination Act of  
2000 Public Law 106-393)**



**Prepared by  
Plumas Corporation  
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## **Project Description**

The Greenhorn Creek Watershed Restoration Project is an integrated project to restore trout populations and improve bank stability on Greenhorn Creek through American Valley. The integrated project consists of four bank stabilization and two fish passage treatments. Figure 1 displays the location and proposed treatment of each site. These treatments were determined and prioritized through a survey and planning effort funded by the Plumas County Board of Supervisors using Title III funds. Objectives of the RAC funding were to obtain environmental clearance, continue project coordination, and monitoring for all of the proposed treatment sites, and implement treatment of one site on Plumas National Forest and private land (Reid Ranch). Environmental clearance consisted of: 1) field surveys and reporting for cultural resources, wildlife and botany on a total of 35 acres in six locations; 2) CEQA and NEPA documentation; and 3) permits obtained from the California Department of Fish and Game, the Regional Water Quality Control Board and the Army Corps of Engineers. For the purposes of environmental clearances, all of the treatments were considered to be one single project.

Project coordination with all landowners along Greenhorn Creek was ongoing to ensure all property owners along the creek were informed of the project proposal and were given opportunity to comment and bring forth issues. In addition we coordinated with Caltrans and Plumas County on transporting rock from the Spanish Creek Bridge Replacement Project to a county stockpile site for use on Greenhorn Creek. We procured 7,000 cubic yards of material, at a value of \$98,000 (\$14/yd<sup>3</sup>), that will be used for the fish passage projects. The material has been stockpiled near the airport under a lease negotiation with Plumas County, until further implementation funding is secured. Without a partner for material and storage, the fish passage projects would be too expensive. Coordination funds were also used to explore other funding opportunities. Applicable funding sources were not available during this agreement period; however, upcoming sources have been identified and will be pursued in 2012, including Prop. 84-Sierra Nevada Conservancy (SNC), Urban Streams, and Caltrans Environmental Enhancement Mitigation Program (EEM). CEQA/NEPA completion is a requirement for many funding entities prior to applying for implementation funds. The ability to complete the environmental compliance requirements with RAC funding has been critical in moving this project forward.

The bank stabilization project site at the upper end of Russell Reid's property, and the downstream end of the National Forest property on Greenhorn Creek (see Figure 1. location map) was constructed in October 2011. The project entailed the installation of four boulder vanes and bank re-vegetation along a 390-foot eroding bank. The boulder vanes create pool habitat in this location that was wide and shallow (see Figure 2. before and after project photos). Monitoring was designed to build upon the on-going water quality monitoring conducted by irrigating landowners, and the FR-CRM's Stream Condition Inventory (SCI) site at the mouth of Greenhorn Creek, as well as an additional sample site near the upper end of American Valley. Pre-project monitoring parameters measured included pool depth and bank stability (from SCI protocol), event sampling for sediment (turbidity), and water temperature between May and October. This agreement terminates on December 31, 2011. Because the project was just constructed, post-project monitoring samples will not be collected until 2012. Data will be submitted to the Grant Manager after sample collection and data analysis is complete in October of 2012.



Figure 1. Greenhorn Creek Watershed Restoration Project treatment locations.



Funds provided for the project were as follows:

|          |   |
|----------|---|
| \$19,550 | Plumas Co. Board of Supervisors Title III planning funds              |
| \$ 3,240 | Shea Ranch planning funds   |
| \$68,360 | Plumas Co. Resource Advisory Committee                                |
| \$98,000 | Caltrans contractor rock donation from Spanish Crk Bridge Replacement |
| \$ 2,000 | Plumas National Forest (contract administration)                      |
| \$ 360   | Plumas Co. Resource Advisory Committee (Watershed Monitoring 2012)    |
| \$ 120   | Citizen volunteers event monitoring                                   |

Final construction costs were \$19,148 (included equipment and operator, boulders, and seed). We were \$232 over budget due to costs associated with the lease and permitting for the rock stockpile on county property. Storage of material was originally planned on the private landowner property, but the Caltrans contractor was unable to donate the material if it had to be transported the extra distance out to Chandler Road.



Figure 2. Before and After Construction Photos PNF/Reid Bank Stabilization Project Site, October 2011.



Pre-construction Streambank and Point Bar (*looking upstream from bottom of project*)



Immediate Post-construction Streambank Treatment  
Boulder Vanes, Floodplain Bench & Sloped Streambank (*looking upstream from bottom of project*)





Pre-construction Point Bar, Floodplain and High, Droughty Gravel Bar  
*(looking upstream from bottom of project)*



Immediate Post-construction Floodplain and Vegetation Transplants  
Floodplain Lowered Three-Foot *(looking upstream from bottom of project)*

Project construction began on October 18, 2011 and was completed on October 27, 2011. Out of five bidders, the construction bid was awarded to Feather River Materials for \$19,000.

### **Did the project meet the purposes of Public Law 106-393 legislation?**

Implements stewardship objectives that enhance forest ecosystems: The monitoring goal was to improve fish habitat within the implementation project area. The forest ecosystem encompasses the riparian habitats that support that system. Habitat and bank stability protocols from the USFS Region 5 SCI were used to measure pool depths and cover in the project area pre-project on Greenhorn Creek. The site before construction was wide and shallow with little cover due to the vertical cut bank. The installation of the four boulder vanes will create deep pools and riffles as the project responds to storm events and movement of material in the system this winter. Vegetation will mature as well over time, stabilizing the laid back bank and floodplain terrace. Although, post-project data will not be collected until 2012, we have constructed several similar bank stabilization projects that have all responded with the expected outcomes outlined above. Actual measurements and analysis of the data will be reported to the Grant Manager by October 2102.

Restore and improve land health: By restoring the stream and fish habitat, highly productive riparian habitats can provide refuge and movement corridors for upland species. In addition, a healthy fishery provides recreational opportunities for fishing. Fish population sampling will be conducted before implementation of the fish passage projects.

Restore water quality: Water quality has been monitored through measurement of water temperatures at Massack (upstream of Hwy 70 crossing), downstream of Hwy 70 on the Scoppwer Ranch, Reid Ranch, Carol Lane East Bridge, and at the mouth of Greenhorn Creek. Event samples for turbidity were collected at Massack, Farnworth Ranch (immediately upstream of Hwy 70 crossing), Quincy Junction Road, and the mouth of Greenhorn Creek. Two samples were analyzed for heavy metals in March 2010, as well. The Reid Bank temperature device was lost in 2011, but all other sites were collected. Monitoring samples will be taken again in 2012, and will be reported to the Grant Manager in October 2012.

### **Lessons learned**

Coordination with multiple landowners and entities can be challenging. Continued improvement in communication methods has improved our response to project planning and implementation. Continuing changes to permitting requirements and fees have inflated project costs. Future funding requests should incorporate a contingency for increases in fee rates and continual changes in regulatory requirements.

### **Continued Monitoring**

Fish population sampling will be conducted prior to implementation of the fish passage project sites. Water quality and fish population data can be compared to previous project-specific and watershed sampling conducted by the FR-CRM on Greenhorn Creek.