

Mattole River and Range Partnership Implementation Reduces Sediment in the Upper Mattole Watershed

The Mattole River drains a 296 square mile watershed located in the northern California Coast Ranges, in western Humboldt County and northernmost Mendocino County. The river enters the Pacific Ocean about 30 miles south of Eureka and 290 miles north of the Golden Gate. It drains primarily northwestward to the area of Petrolia and then flows west to the Pacific. The watershed shares divides with the Eel River to the east, Bear River to the north, and small drainages leading to the Pacific on the west.

The Mattole watershed is located in a tectonically active area with some of the highest rates of crustal deformation, surface uplift, and seismic activity in North America. It also receives high amounts of rainfall, averaging from 60-115 in/yr. The natural setting of the Mattole watershed, along with accelerated sediment delivery caused by human activities, has resulted in the delivery of high volumes of sediment to streams. As a consequence, salmon and steelhead populations in the Mattole River watershed have declined. Coho salmon (*Oncorhynchus kisutch*), chinook salmon (*O. tshawytscha*), and steelhead trout (*O. mykiss*) in this watershed are all listed as threatened under the federal Endangered Species Act. Salmonids have a variety of requirements related to sediment, which vary by life stage. Sediment of appropriate quality and quantity (dominated by gravels, without excess fine sediment) is needed for redd (i.e., salmon nest) construction, spawning, and embryo development. Excessive quantities of sediment or changes in size distribution (e.g., increased fine sediment) can adversely affect salmonid development and habitat.

In 1992, the Mattole River and its tributaries were placed on the 303(d) list due to sediment impairment. The TMDL, adopted in 2003, is based mostly on the *Mattole River Watershed Technical Support Document (TSD) for Sediment and Temperature* (NCRWQCB, 2002) prepared by North Coast Regional Water Board staff in support of TMDL development, and by the *Mattole Watershed Synthesis Report* produced by the North Coast Watershed Assessment Program. Sources of sediment delivery to aquatic habitat include natural erosion processes as well as those influenced by human activities, such as road construction, operation and maintenance, timber harvest activities, and livestock grazing. The total estimated current rate of sediment delivery for the entire watershed is 8000 tons/mi²/yr, with approximately 36% attributed to natural erosion processes and 64%



Figure 1. Landslide caused by a road

attributed to human activity.

The Regional Water Board determined that setting the TMDL at 125% of natural sediment delivery is appropriate for the Mattole. Using the estimated natural sediment delivery rate of 2900 tons/ mi²/yr, the TMDL for the Mattole River is: TMDL = Loading Capacity = (125%) x (2900 tons/ mi²/yr) = 3600 tons/mi²/yr. The allocations, when achieved, are expected to result in the attainment of the applicable water quality standards for sediment for the Mattole River and its tributaries.

The Mattole Restoration Council (Council), established in the early 1980s, has undertaken the task of decreasing the amount of human caused sediment delivery to streams. The Council has also conducted assessments, inventorying sources with sediment delivery potential of 10 cubic yards or more. The Council has implemented a number of grant-funded projects within the watershed over the years, including the Mattole Watershed/Range Partnership Implementation project, targeting sites in the Upper Mattole watershed. The project (Agreement No. 05-060-551-0) began in April 2005 and will end in December 2008. The goal of this project is to treat 89 sites with a long term sediment pollution reduction of 48,400 cubic yards.

To address the problem, the Council has employed several best management practices (BMPs), including culvert replacement; road reshaping; installation of water bars, grade checks and armored fords; stream bank stabilization, excavation of crossings and/or built up sediment; installation of critical and rolling dips and rip rap; and road outsloping. In addition, the Council has a good educational program for both schools and adult workshops that promote watershed stewardship.



Figure 2 Road sediment draining to stream

This project took place in the upper section of the watershed that extends from the head of the river, at river mile 61, to a half-mile downstream from the mouth of Eubanks Creek, at river mile 42.8. The uppermost two miles of the watershed is typical mountain valley; narrow and steep-sided, with a steep gradient and very little flood plain. This area's sediment delivery is estimated at 4,400 tons/ mi²/yr. Seventy-five sites were treated the first year of this project (2006). Approximately 7,725 cubic yards of potential sediment was removed from stream channels and 15,830 cubic yards of sediment was stabilized. This represents 56 percent of the overall sediment targeted for reduction through this project. (The project has continued into 2007 with significant work at 40 sites, preventing delivery of an estimated 15,000 cubic yards.)



Figure 3 South Fork of Bear Creek

The Mattole Restoration Council partnered with Sanctuary Forest, Upper Mattole River and Forest Cooperative, State Coastal Conservancy, Wildlife Conservation Board, Fishamerica Foundation, and California Department of Fish and Game. The project was supported by a CWA section 319(h) grant for \$500,000 along with \$547,068 in match. The project had 68 percent participation by landowners by area.

This project is only one of many efforts in the Mattole River watershed aimed at reducing sedimentation of streams. The Mattole Restoration Council developed the *Elements of Recovery* in 1989 and the *Mattole Watershed Plan* in 2005 both of which recognize the problem of sedimentation of streams, and recommend actions to reduce it. They have conducted many assessments and completed several other grant projects. The reductions in sediment delivery affected by this project represent only those made in the upper part of the watershed in one year. The Council is currently working in other areas of the watershed, as well, to reduce erosion and improve streams. They are involved in forest fuel reductions, water supply issues, education and training, invasive plant removal and native riparian planting, watershed-wide timber harvest permits, cumulative effects analysis, temperature and water quality monitoring, reforestation, estuary improvement, and flow monitoring. Additional grant funds are being sought for future watershed work.

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