Deadwood Road Sediment Reduction Project
Final Report
Contract #P0210425
June 2003 – March 2005

Deadwood Road is, relative to the county road system, a low-use road, many portions of which run right along Deadwood Creek, a tributary to the Trinity River that joins just below the Trinity River Hatchery and downstream of Lewiston and Trinity Lakes. Deadwood Creek provides important spawning and rearing habitat for coho and Chinook salmon and steelhead. The coho salmon is a state and federal Threatened species under the respective Endangered Species Acts.

To visit the project site, one should begin at the start of Deadwood Road so that mileage information provided for each site may be easily followed. Deadwood Road begins near the Old Lewiston Bridge at the center of Lewiston. From Redding, CA take State Highway 299 west to the first Lewiston turnoff (~29 miles) at Trinity Dam Blvd. Turn right/west and continue on Trinity Dam Blvd for about 5.5 miles to Deadwood Rd just before the bridge over the Trinity River. Turn left/south onto Deadwood Rd and continue about 0.75 miles to the intersection with Lewiston Turnpike Rd. This is mile 0.0 of Deadwood Rd. To reach the project site, take Deadwood Rd back north for about one mile.

The watershed is located within the Eastern Klamath Subprovince of the Klamath Mountains geologic province. This project area includes Copley greenstone in the lower part of the watershed and Bragdon Formation rocks in the upper two thirds of the watershed. Both geologic formations are relatively stable and, in general, erosion resistant. Soils are predominately gravely loams with varying sand and clay content derived from meta-sedimentary parent rock. Water available content is low to very low for all soils and portions of the area consist of exposed parent rock.

Deadwood Road accesses several homes, historic mines, Bureau of Land Management lands and private forestlands. It also provides an alternate route to French Gulch/Redding. This road was identified as a high priority county road erosion treatment site, partly based on data obtained through the 5C Trinity River watershed road erosion inventory known as DIRT. Prior to this project, the portions of road proposed to be treated were largely unsurfaced and, according to the DIRT road erosion inventory, had the potential to deliver over 4,321 cubic yards of sediment to Deadwood Creek over a ten year period. Consequently, a proposal to treat this road was submitted under various funding sources as part of the Five Counties Salmonid Conservation Program's (5C) larger efforts to improve water quality. A migration barrier removal project is being done at the county road crossing of Deadwood Creek downstream of and concurrent with the sediment reduction work discussed in this report.

Deadwood Road Sediment Reduction Project was funded under this contract with matching funds from Proposition 204 through the State Water Resources Control Board, the Trinity River Basin Fish and Wildlife Restoration Grant Program, and with in-kind contributions from the Trinity County Department of Transportation (TCDoT). Special acknowledgement is given to the Bureau of Land Management and private landowners for working with the TCDoT to conduct separate road improvements that generated rock material used in this project.

Project Timelines

Photo monitoring of the road segment began in February 2003, prior to the start of this project. Work under this project began in May 2003 under a matching grant source. This contract became active in June 2003. Construction work began in the summer of 2003 and was not completed until March 2005. Additional photo monitoring will be performed as part of the 5C effort to track restoration projects and monitor overall program effectiveness.
In March of 2003, the CDFG contract manager and project managers conducted a site visit to discuss proposed treatments. From May to August 2003, the project was staked in coordination with the Trinity

County Department of Transportation (TCDoT). Additional photo monitoring was also conducted during the last few months of 2003 and continued until project completion. CEQA analysis was completed in summer 2003. On-the-ground construction work began in late summer 2004 with road brushing. Treatment work, consisting mostly of road surface treatments such as grading, outsloping, installation of rolling dips, and some ditch relief culvert placement continued until the start of the rainy season in mid-October. A streambed alteration agreement (1601) was received in August 2004. Work resumed again in summer 2004, with the completion of larger stream crossing upgrades included in the 1601 and finalization of the majority of road surface treatments. Road rocking was also performed during the 2004 construction season. Work again stopped at the start of the 2004 construction season and was finished during the dry periods of spring 2005. Work completed in 2005 consisted of smoothing out some of the rolling dips and shaping and rocking the outboard fill face of site 1499 (see site treatment list below).

Project Work/Treatments

The treatments implemented were based on DIRT road erosion inventory prescriptions that were modified in accordance with the CDFG grant manager and the TCDoT. It should be noted that due to the nature and relatively low use of the road, it was agreed that extensive outsloping was suitable to reduce potential sediment delivery. The amount of outsloping done here is unusual as compared to typical county road treatment prescriptions. Preference was given to outsloping and the installation of rolling and critical dips over the installation of ditch relief culverts whenever possible to reduce project costs and future road maintenance needs.

To date, 5 miles of road have been outsloped, 4.7 miles of road ditch have been removed, approximately 2 miles of berm have been removed, 5 critical dips were installed and an existing dip regraded, and 27 rolling dips have been installed. Three ditch relief culverts have also been installed. One of these at site 1467, includes a downspout. One of the rolling dips, about 4 miles of the filled ditch, and about 4.7 miles of the outsloping were not originally prescribed as part of the project's recommended treatments and are part of the County's in-kind contribution. Eight stream crossings were replaced at the following sites: 1469 (with a flared inlet), 1470 (with a drop inlet to catch ditch erosion), 1473, 1478, 1479, 1484, 1488, & 1499. Culverts have been installed to accommodate 100 year flow events. One wet crossing was installed at site #1486 and two were upgraded at sites #1501 & 1502. At these crossings, approximately 1,000 ft^2 of total road surface was rocked and over 250 ft^2 of outboard fill face was armored with large rock and boulders. The Bureau of Land Management agreed to allow the TCDoT to build emergency turnouts at three locations along the road with rocky, non-erosive cutbanks. Materials generated were then used to rock portions of the road. More than two miles of road, throughout the 6 miles spanning the fourteen treatment sites, was rocked primarily with local material. Most of this surfacing was not included in the proposed treatments and is counted as in-kind. It is also the County's intent to continue to utilize rock from adjacent pits to surface additional portions of the road as their maintenance schedule allows. Refer to Attachment A for site photos and to the list below for a summary of treatments for each DIRT site (identified for treatment in the Five Counties Salmonid Conservation Program's county road erosion inventory). Disturbed areas outside of the main road bed were seeded with native plants and mulched.

Site Specific Treatments

Please refer to the project map for site locations as indicated by site number. Treatments shown on the map are shown for each site. Many road treatments, such as rolling dips, are not shown individually but are indicated next to the site with which they are associated. Many of these sites are also included in the project photo log (attached).

Site 1467, mile 1.08
This site was treated as proposed. The culvert was replaced with an 18" x 25' double wall, smooth bore plastic pipe. Twenty feet of single wall, plastic downspout was attached.

Site 1469, mile 1.49
The culvert was replaced with a 35" x 24" x 30' corrugated metal squash pipe with a flared inlet. This also serves as an emergency overflow for site 1470. In lieu of placing 60' of half-round downspout as originally proposed, the outlet channel was rock armored. In this case, rocking was deemed to be just as effective as the proposed downspout.

Site 1470, mile 1.6
The two separate culverts were replaced with a single 30" x 100' smooth bore plastic pipe instead of the 49" x 33" x 100' culvert originally proposed. It was agreed that a plastic pipe would be suitable and easier to fit within the fill/road height. A drop inlet with grate was installed to catch ditch erosion. The outlet area was also rocked.

Site 1473, mile 1.91
This site was treated as proposed. The culvert was replaced with a 30" x 40' double wall, smooth bore plastic pipe. Three rolling dips were installed above the culvert.

Site 1478, mile 2.62
This site was treated as proposed. The culvert was replaced with a 24" x 40' double wall, smooth bore plastic pipe. One rolling dip was installed above the culvert.

Site 1479, mile 2.73
This site was treated as proposed. The culvert was replaced with a 35" x 24" x 40' corrugated metal squash pipe. A critical dip was formed and a rolling dip installed above the culvert. The inlet and outlet areas were also rocked.

Site 1482, mile 3.21
This site was treated as proposed. The berm and ditch were removed. Two rolling dips were installed above the site.

Site 1484, mile 3.5
The culvert was replaced with a 30" x 50' smooth bore plastic pipe instead of the 49" x 33" x 50' metal squash pipe originally proposed. It was agreed that it would perform the same function. To ensure no outlet erosion was caused, the outlet channel was rock armored. A critical dip was installed and the inlet was also rock armored. Above the site, two rolling dips were installed and berm was removed.

Site 1486, mile 3.76
This site was treated as proposed. A wet crossing and critical dip were installed and rocked. The berm and ditch were also removed.

Site 1488, mile 4.08
This site was treated as proposed. The culvert was replaced with a 24" x 40' double wall, smooth bore plastic pipe and critical dip. The berm and ditch were also removed. Two rolling dips were installed above the culvert. An additional length of half pipe was staked in at the outlet to act as a downspout.

Site 1490, mile 4.53
This site was treated as proposed. A critical dip was installed and three rolling dips were installed above the culvert. The berm was also removed.

Site 1499, mile 6.15
The culvert was replaced with a 36" x 100' double wall, smooth bore plastic pipe. In lieu of placing 40' of half-round downspout as originally proposed, rocking the outlet channel was deemed to be just

as effective. In this case, the cost of a single-wall plastic downspout for the 36" replacement pipe proved significantly more expensive than anticipated. The culvert was extended approximately 20 feet and the outboard fill face slope was laid back to a gentler angle and rocked. Four rolling dips were installed above the culvert. The berm was also removed.

Site 1501, mile 6.89
This site was treated as proposed. The wet crossing was improved with a critical dip and rocking. The outboard fill face was reshaped and rock armored.

Site 1502, mile 6.98
This site was treated as proposed. The wet crossing was improved with a critical dip and rocking. The outboard fill face was reshaped and rock armored. Above the site, three rolling dips were installed and berm was removed.

Throughout the treated road section, six additional rolling dips were installed and extensive outsloping (5 miles total) was completed. It should be noted that in the wet crossings (1486, 1501 & 1502), large cobbles were placed in the crossing with a layer of shale on top. The significant rocking may not be immediately evident underneath the layer of surface shale.

Project Costs

The overall project totaled approximately $132,964. About 19% ($25,090) of the total project was funded through this contract, 48% ($64,562) through matching grant sources, and 33% ($43,312) through TCDoT in-kind contributions.

Of this amount about $78,000 (59%) was spent on salaries, approximately 13% of which was paid for through this contract. The personnel hours expended totaled 3,011 and includes project managers, TCDoT staff, and road crew time. Approximately 324 total hours (from all sources) were spent by the project managers, not including the TCDoT. This includes time spent managing the grants, meeting with TCDoT, conducting site reviews, and monitoring. Approximately 37% of the total project expenditures provided for equipment and materials. Equipment used included excavators, backhoes, water trucks, graders, and brushers. Other costs included permits and non-salary administrative costs. Assuming that 4,321 cubic yards of potential sediment as originally estimated was treated, the cost savings are about $\$31/yd^3$.

Conclusion

The treated road segment was returned to as hydrologically neutral a state as practical. As mentioned above, the TCDoT intends to continue rocking additional road segments as part of their road maintenance and improvement schedule. Their commendable work in this project builds upon many other 5C efforts including the implementation of the roads maintenance manual. Their experience in completing this project adds to their familiarity with road treatments that have not yet been fully incorporated into their routine road maintenance and improvement practices. Feedback from the crew assigned to this project indicates that it was a good learning experience that also contributed to their understanding of the 5C program and its goals.

Attachments:

- Project Location Map
- Project Photo Log
- Treated Site GPS Information