Final Report for the Eightmile Valley Sediment Reduction And Habitat Enhancement Project

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SWRCB Agreement #D171350401

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Cover Photographs

Monitoring point 3, 39.089821º, -123.077585º, Orientation 252º W, post construction, left photograph

Monitoring point 10, 39.090630º, -123.079245º, Orientation 34º NE, post construction, right photograph

1. Project Summary

The Eight Mile Valley Sediment Reduction and Habitat Enhancement Project was designed to implement restoration management practices to reduce phosphorus loading to Clear Lake. The Total Maximum Daily Load (TMDL) for Nutrients in Clear Lake suggests that nuisance blue-green algal blooms are caused, in part, by phosphorus loading delivered via nutrient laden sediments to the lake from the upper watersheds.

Willow Creek, flowing through Eight Mile Valley, is a headwaters tributary of Scotts Creek, which is a major tributary to Clear Lake. Scotts Creek, in combination with Middle Creek, is targeted in the TMDL requiring a 60% load reduction to the lake. Willow Creek, within Eight Mile Valley, has been directly impacted by historic agriculture practices that contributed to downcutting, thus creating active erosion. Modern day activities include a network of unpaved OHV trails upstream of the project area.

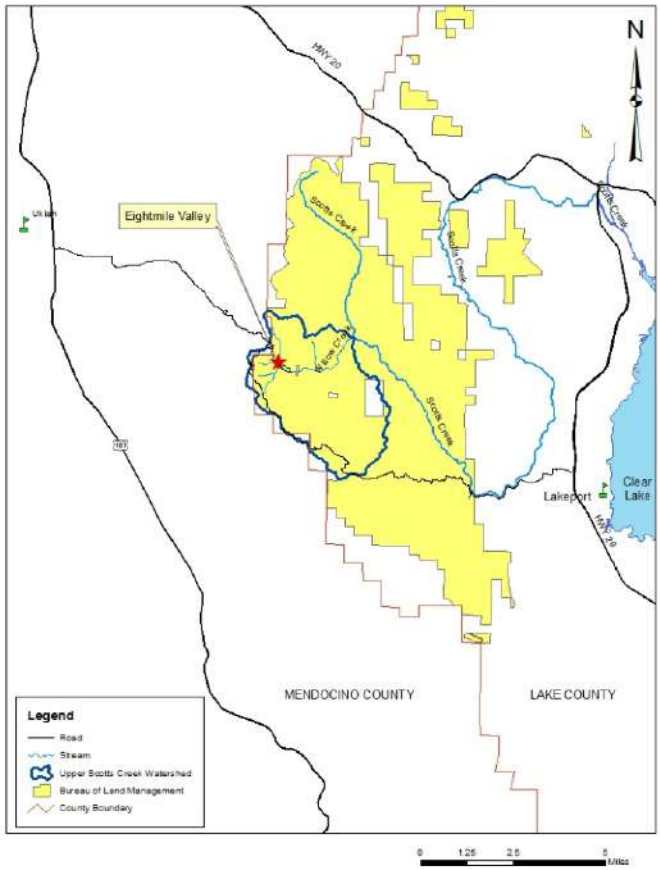
Bureau of Land Management (BLM) land managers implemented a restoration project in 2005. The severe winter storms of 2005/2006 caused the catastrophic failure of the project creating multiple new headcuts throughout the valley. The cuts, left unchecked, would have continued to erode and transported fine sediment to Clear Lake.

The project provided improved habitat for aquatic life and wildlife, utilizing bio-engineering and hardscape streambank protection. The project also captured erosion from upstream OHV use, retaining sediment on-site. This project contributes to the improvement of the beneficial uses of Clear Lake as listed in the TMDL.

2. Background

a. Location

Eightmile Valley Project Location



The project, approximately ten miles east of Ukiah, California, was located within the BLM's South Cow Mountain OHV Recreation Area in a chaparral ecosystem at 2,200 feet elevation. Weather patterns typical of Mediterranean ecosystems normally receive an average of 36-inches of mostly rain and occasional snow. Rain generally occurs December through February, with occasional rainfall taking place as late as June. Summer streams are dry, while infrequent floods exceed 500 cubic feet per second. Unfortunately, we did not see the typical Mediterranean weather pattern during this project.

b. Watershed Description

Land use for the project area consists of on road and Off Highway Vehicle (OHV) recreation with 138 miles of trails available. Stressors on the project are historic grazing and cattle practices which caused erosion, headcutting and downcutting caused by storm runoff and the OHV use of approximately ten miles of trails above the project.

c. Historical Uses

Historic agricultural practices in Eightmile Valley re-routed stream channels and created a system of gullies up to 12 feet deep. A Plug & Pond Restoration Project, involving the reshaping/raising of the streambed and plugging a diversion with fill borrowed from ponds that were created for fill material, was implemented by the BLM in 2005. The Plug and Pond method works well in the Sierra Mountains with slow snow release, however, the severe winter storms in 2005/2006 (a 250 year storm event) caused catastrophic failure of control structures by overwhelming the project with flood waters and developing a new gully system on the valley floor.

d. Problem Statement & Relevant Issues

Due to the rerouting of the streambed for agriculture uses in the 1940s and the failed Plug & Pond Restoration Project, headcuts and downcutting increased in the valley over the years. The issue that inspired the current restoration effort was the TMDL for Nutrients in Clear Lake.

3. Project Description

a. Project type

The project design was engineered by SHN Consulting Engineers & Geologists, Inc. The design incorporated reclining the head cuts and gullies, hard facing channels, and bioengineering utilizing native plants, grasses, and willows.

b. Project Cost

The budget for this project was originally $731,728.00, to date a total of $567,107.77 (pending final invoice) has been spent implementing the project.

c. Project Schedule

The project was originally scheduled for completion in early 2020, but was delayed due to the catastrophic River Fire of 2018. An extension was granted with an end date of March 31, 2021. Meeting that goal proved challenging as well, due to the coronavirus pandemic and drought. Progress was halted for several months due to the shelter-in-place orders issued by the State of California; the Bureau of Land Management (BLM) closed public lands to any access during that period, so we were unable to work on the project during that time period

The project encountered a number of natural and man-make catastrophic events. The River Fire was followed by a flood year, then a drought, then the shutdown of activities due to the pandemic, then followed by a drought in the 2020/2021 fall/winter. This list of disasters did not offer the opportunity to implement the revegetation plan on schedule. Soil moisture was and is insufficient to plant the native plants and plugs in the upper portion of the project area during the 2020/2021 fall/winter storm season.

BLM will implement the unfinished portion of the revegetation project in the fall/winter of 2021/2022. BLM has set aside funding to implement the remaining revegetation plan with the native plants and plugs that had been secured for the project.

d. Project Goals

Due to historical farming practices originally causing the diversion and downcutting along with the failed 2005 restoration project, the project was designed to fix the issues as described below.

An exposed vertical mineral soil banks created a gully system which allowed for accelerated erosion during peak flows, discharging nutrient laden sediment downstream. The goal was to prevent the downstream discharge of sediment and hold these sediments on site.

Channel realignment shaped the exposed vertical soil banks of the gullies to the angle of repose found in a natural stream bank system. Grade control and rock stabilization structures were implemented to slow the velocity of the water during peak flows, thereby retaining sediment in the valley and preventing the discharge of nutrients downstream.

Heavy equipment was utilized to perform the physical work of channel realignment. Post-construction, the banks were hydroseeded with native grasses and blown hay for seed stabilization. Upslope areas were seeded utilizing hand crank broadcasters and hay was disbursed by hand to retain the grass seed during wind events.

A revegetation plan was developed detailing all restoration/revegetation specifications for the reestablishment of bank and riparian vegetation/habitat. Due to drought, only 25% of the Revegetation Plan has been implemented. Soil moisture was insufficient to establish the native plants and plugs in critical areas.

e. Project Methodology

The USDA, NRCS Field Office Technical Guide, Standard for Practices and the California Salmonid Stream Habitat Restoration Manual practices were utilized in design development and implementation. Practices were specifically selected to address water quality goals of the project and the beneficial uses of the project site.

f. Water Quality Data

Due to drought conditions, only eight samples were gathered over the course of the project. Mccord Environmental Inc. modeled the load reduction using the STEPL model. The model shows a 55.2% sediment load reduction post project. This output is consistent with the calculations done by USGS represented in graphs based on the lab results and field data gathered in the eight samples. (See Appendix A.)

4. Public Outreach

A tour hosted by the Lake County Resource Conservation District (LCRCD) and BLM was held on October 3, 2019. Attendees included representatives from the Scotts Valley Band of Pomo Indians, the Central Valley Regional Water Quality Control Board, BLM and LCRCD board members.

The tour was held during construction, allowing participants to witness project implementation. While the tour was being conducted, the attendees participated in a Q&A session about design, methodology and project goals.

5. Project Evaluation and Effectiveness

a. PAEP targets:

Target #1

Installation of up to 2,500 linear feet of streambank protection and 14 stream bank BMPs (control structures). A total of seven grade control structures and eleven rock stabilization structures were implemented in 3,300 linear feet, a total of 18 control structures in all. (See Appendix B.)

Target #2

Installation of up to 2,500 linear feet of streambank protection and 17 streambank BMPs (bioengineering.) Due to the drought of 2020/2021, in the 3,300 linear feet of streambank protection, there were only 11 sites where the soil moisture was sufficient for willow planting. (See Appendix C.)

Target #3
Installation of an educational kiosk on site demonstrating management practices implemented throughout the project area. A kiosk was installed at the project for visitors to view.

Target #4
Disseminate water quality improvement to all participants. A tour of the project was held October 3, 2019 during construction demonstrating implementation, BMPs and the reason for the project.

b. Sample Before/After Site Photographs

Before Photopoint Monitoring Site 8

After Photopoint Monitoring Site 8

Before Photopoint Monitoring Site 18

After Photopoint Monitoring Site 18

Photopoint Monitoring Sites can be found in the Appendices. (See Appendix D.)

As stated, the only component that hasn't been successful is the revegetation. The lack of success was due to the lack of penetration of moisture in the soil, streamflow and ground water recharge during a two-year drought. The native plants and plugs were not able to establish without the necessary moisture.

6. Conclusions

During this project, a number of circumstances delayed or disrupted the schedule of work. The catastrophic 2018 River Fire burned the project site and an extension was granted due to the water quality impact caused by the fire, delaying implementation. The River Fire was followed by a flood event that accelerated erosion, headcutting, downcutting and erosion.

Construction was implemented in the summer of 2019. Gullies were reshaped, grade control structures and rock control structures were installed within 3,300 linear feet of the valley floor.

The single rain event that allowed for the one and only water sample in fall/winter 2019/2020 also did damage to the project. Some of the hay that was broadcast to protect the native grass seed was carried into the grade control and rock control structures causing minor damage to several of the structures. Repairs were implemented in the summer of 2020 to the damaged structures.

The drought continued into the fall/winter of 2020/2021. This condition allowed for only two samples to be gathered in March 2021. Due to drought the revegetation was limited to willow planting only in the lower end of the project area where there was sufficient soil moisture to plant.

The next step is to plant in the fall/winter of 2021/2022 under funding set aside by BLM to complete the revegetation portion of the project.

Overall, will successfully function as designed in spite of the delays, changes and drought. The STEPL model shows a 55.2% sediment load reduction post project. The original estimate for sediment load reduction was pledged at 30% post construction.

7. List of Deliverables

1. HUC-12 for the project site
2. Stream reach for project site and monitoring locations
3. PAEP
4. Monitoring plan
5. Monitoring reports
6. QAPP
7. CEQA/NEPA
8. Public Agency approvals/permits
9. Revegetation plan
10. Subcontractor contract
11. Notice to proceed
12. As built drawings
13. Pre, during, and post photo monitoring
14. Workshop/tour of project
15. Progress reports
16. Annual progress summaries
17. NRPI
18. Draft project report

19. Final project report
20. Final Project Summary
21. Final project inspection and certification (See Appendix F.)
22. Lobbying certification
23. MBE/WBE documentation

8. Relevant Reports

Clear Lake Mercury and Nutrient TMDL
https://www.waterboards.ca.gov/rwqcb5/water_issues/tmdl/central_valley_projects/clear_lake_nutrients/cl_nut_mon_implementation_plan.pdf

Scotts Creek Watershed Assessment
http://www.lakecountyca.gov/Government/Directory/WaterResources/ClearLake/Watershed_Protection_District/watershedplan/Scotts_Cr_WA.htm

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