

**Final Report**

***McCREADY GULCH FISH PASSAGE  
BARRIER REMOVAL PROJECT***

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**For  
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**Introduction**

McCready Gulch is a tributary of Freshwater Creek, which drains into Humboldt Bay. The stream has a relatively low gradient for over 9,500-feet and supports runs of both coho salmon and steelhead trout. Although McCready Gulch has a relatively small drainage area (2.0 square miles), it produces year-round flow and maintains cool water temperatures during summer months. One of the limiting factors in this stream was the presence of a perched concrete box culvert and two instream weirs that inhibited migration of juveniles to upstream rearing habitat and delayed passage of adult anadromous fish to upstream spawning habitat.

**Description of Previously Existing Barrier Culvert**

Freshwater Road was realigned in the 1950's and a new culverted stream crossing was placed in McCready Gulch 60-feet downstream of the original crossing. The original crossing was left as a driveway for residential use but continues to be under County ownership (but not maintained). The stream-crossing structure was a 64-foot long concrete box culvert. Washington style baffles were previously installed to improve adult migration through the culvert, but the culvert outlet was perched 3-feet above the downstream outlet pool.

The crossing had past its design life and begun to structurally fail. The concrete headwall fell into the stream channel, and a large sinkhole had formed within the fill of the crossing. The evacuated material had fallen through a hole in the downstream headwall

and into the stream. After numerous complaints, the County filled the hole during the spring of 2000. Without extensive repair, the fill material would have continued to make its way into the stream channel again. Additionally, settling of the culvert had created large cracks in the concrete and had disturbed the road surface. Finally, there were two car bodies along the stream banks at the culvert outlet, which were hindering riparian growth and posing a danger to public safety.

As part of a NMFS funded Fish Passage Research Project, field personnel observed the outlet of the culvert regularly between November 1998 and April 2000 to determine how it was performing and if juvenile fish were attempting to migrate upstream. During winters of 1999 and 2000, 23 leaps by juvenile fish were recorded at the culvert outlet on ten separate occasions. During the same period 27 adult attempts were observed on five different occasions. It took one adult steelhead 17 attempts before making it through the culvert. The results of the fish passage analysis funded by NMFS suggested that the culvert was a complete barrier to juvenile and residential salmonids attempting to migrate upstream for winter refuge due to the perched outlet. The culvert is also a partial barrier to adult coho and steelhead, delaying upstream migration and forcing fish to expend vital energy reserves through repeated jump attempts at the outlet. Due to the flashy nature of flows on this stream, these migrational delays can also reduce the amount of accessible habitat and time-period available for spawning.

**A. CONTRACT NUMBERS:** Actual funds to accomplish this work have been provided through: CDF&G Contract Number P00103323, NFWF Project Number (CA) (2002-0368-013), and PSMFC Agreement Number COHO-NC-8.

**B. LOCATION OF WORK:** The proposed project site is located on McCready Gulch (T4N, R1E, Sec. 3) approximately 5-miles southeast of Eureka. Access to the site is via Freshwater Road, off Myrtle Avenue. At mile 2.0, Freshwater Road crosses McCready Gulch. Approximately 60-feet upstream is the project site.

**C. DESCRIPTION OF COMPLETED PROJECT:**

An initial planning meeting was conducted (6/26/01) with the project manager, the engineer, and the hydrologist to discuss tasks and timelines, and review and sign subcontract documents. During mid-November 2001 a survey of the site was conducted by the engineer and the hydrologist. Following the site survey and data collection, computer drafting was completed creating a plan view diagram of the existing topographical features. Flow calculations were generated, determining flow volumes and velocities, leading to a plan view diagram, site design and hydraulic modeling. A pre-project longitudinal profile survey was conducted from the downstream end of the county road culvert to just above the upstream concrete weir. The hydrologic calculations and the hydraulic modeling were completed by Micheal Love & Associates, with the site design, environmental documentation, and initial permit application packages completed by Winzler & Kelly.

Due to the lack of an initial survey and construction plans, the actual design and the finer project details were unknown to the project proponents at the time of the original

CDF&G proposal. The completed construction plans identified new variables unknown to the contractors. These variables dictated the need for additional funding to complete the construction as planned. A longer bridge and unexpected monitoring requirements were funded in addition to the original CDF&G contract through this NFWF contract.

A landowner meeting was held 5/11/02 to discuss the entire project, timelines, review the bridge catalogue and discuss color etc. All of the landowners within the project area were committed to seeing the project successfully implemented. This includes the Humboldt County Department of Public Works who still owns the right-of-way, the landowner of the surrounding property (including the upstream weirs), and the landowner that uses the existing crossing for access to her residence. Following numerous communications with the County and CDF&G, another landowner meeting was held 6/3/02 to discuss issues of bridge color, maintenance and liability etc. After resolving the color and liability issues, the bridge was finally ordered.

An initial CDF&G field review was conducted (6/20/02) with Winzler and Kelly, Mike Love and Associates and CSRG present. The modification of the weirs was reviewed in detail, as well as overall project plans and timelines. The initial permit packages were completed and submitted. The bridge and site plans were then finalized following review by the permitting agencies and the County.

By early July, project partners realized that additional funds were needed due to unexpectedly high construction contractor bids, inconsistent and unpredictable permitting issues, and unforeseen permitting requirements. CSRG developed and submitted an Adaptive Watershed proposal for \$24,579.00, which received unanimous approval.

A meeting was held (9/4/02) with County representatives and the CDF&G Contract Manager to discuss the County Encroachment Permit and retention funds. Issues were resolved and the permit was signed that morning. CSRG then worked with Kern Construction in the development and completion of the subcontract agreement, with review and advice from the CDF&G Contract Manager.

A CDF&G field review with the contract manager and warden, Kern Construction, and CSRG representatives was conducted on 9/25/02, to discuss the moving of fish, water pumping, vegetation clearance, and the initial phases of demolition and construction. Permanent photo points were established throughout the project reach. The fish were then relocated under the direction of CDF&G, and the 64-foot long concrete box culvert was broken up and hauled off, the channel realigned, and the stream banks shaped. Rock was delivered by Kern, and a field review meeting was conducted at the site (10/3/02) with the county engineer, project engineer and hydrologist, Kern and CSRG to review progress, the positioning within the channel and depth of the toe trench, placement of the first row of boulders etc. The rock slope protection (RSP) was then installed, as well as the willow within the toe trench at the upstream and downstream ends of the RSP. The concrete sills and bridge were then lowered into place utilizing a crane. Soil compaction tests were completed by the engineers prior to the installation of the concrete sills. Once the bridge was secured, the appropriate fill and road base was placed to ramp up to the

bridge height from the existing driveways and roads. This fill and road base was also compacted according to specifications. Numerous site inspections were conducted by the W & K engineers and Mike Love and Associates throughout the entire demolition and construction phases. The bridge and the adjacent driveway/road areas were then paved to provide the completed driving surface. The small field and stream banks next to the landowner's barn were graded and shaped.

Additional stabilization work was completed on the right upstream bank, to ensure stability during this first winter while the channel adjusts to the instream modifications. The CSRG crew cut and processed the willow necessary and constructed a willow wall revetment at the toe of the bank.

The appropriate equipment was rented, and the CSRG crew, over the course of two days, modified the concrete weirs upstream of the bridge site. These modifications should provide easier upstream fish migration under lower flows over these existing weirs. A well-attended volunteer workday was held 10/27/02 to complete the willow mattress work, rock chinking of the RSP, and cutting and planting additional willow posts. The cofferdams and screening, as well as all pumping equipment was removed 10/30/02. The W&K engineers completed a re-survey of the project site (10/31/02) for the as-built plans required by the county through their encroachment permit.

Lead-in fences to the bridge were then constructed. These fences, as requested by the landowners, consisted of pressure treated wooden posts, with solid-heart redwood boards as cross-members. To put the finishing touches on this large, cooperative project, the Department of Fish and Game Fisheries Restoration Volunteer Program and the CSRG Community Involvement and Public Education Program completed the installation of 3,000 square feet of erosion control mulch with grass seed spread, 30 trees planted, and 80 feet of livestock exclusion fence constructed at the upstream end of the project area (see attached pictures).

A post-project longitudinal profile survey was conducted by Michael Love and Associates and CSRG staff in June 2003 to measure the change in gradient and to determine the approximate head-cut depth throughout the treated stream reach. The survey indicated a head-cut extending approximately 500 ft upstream of the project site and a slightly aggraded channel throughout the county road boxed culvert, providing natural-bottom stream features throughout the length of the county road culvert (see pre/post-project longitudinal profiles). Post-project as-built diagrams have been constructed by Winzler & Kelly.

Removal and replacement of the existing culvert and modification of the upstream weirs on McCready Gulch has opened approximately 9,000-feet of habitat for over-wintering juvenile salmonids and allow for unimpeded access to upstream spawning habitat for adult coho and steelhead. Removal and modification of these drop structures will also increase the stream gradient over approximately 1,500-feet resulting in reduced

sedimentation and increased habitat quality. Opening this upstream habitat to all fish present in the system will likely increase the overall productivity of the stream.

**D. DATES OF WORK/PERSONNEL HOURS:** The project began June 2001 and ended July 31st, 2003. During that period of time CSRG personnel required 290.0 hours to coordinate, manage, assist with construction, complete reporting requirements, and supervise all activities.

**E. TOTAL DOLLARS SPENT:** The actual funds to accomplish this work have been provided through: CDF&G Contract Number P00103323 provided \$114,903, NFWF Project Number (CA) (2002-0368-013) provided \$48,800, and PSMFC Agreement Number COHO-NC-8 provided \$24,579. As matching contributions, the Redwood Community Action Agency provided \$5,000 of rock through a SWRCB 319h contract focused on Humboldt Bay tributaries. Also, a total estimated value of \$3,500.00 was contributed through the efforts of the community volunteers and donated CSRG staff time. And the County of Humboldt provided qualified engineering review and assistance.



View looking upstream during project implementation. Creek flow is diverted around left bank through a hose, allowing CAT operator to work in the creek.



Same view as above picture, after project completion. Bridge is in place, both banks are rocky and stable, and stream flow is diverted back to main channel.



View looking from right bank to left bank after two-part bridge was set in place on concrete footings.



Same view as above after the banks have been rocked and mulched and the bridge has been paved.



Looking from left bank to right bank, the CAT is beginning to remove the asphalt above the culvert. The entire flow of the creek is diverted using this hose lying across the driveway.



Removing fill and asphalt surrounding the box culvert.



The box culvert has been removed and the banks are being re-graded.





A view looking downstream at the fill being taken out of the channel and the banks being reshaped, prior to bridge installation.



Similar view as above after bridge has been placed, banks have been reshaped, rocked, and mulched, and grass, willows, and conifers have been planted in order to re-vegetate the excavated bank .



View of project site after completion in higher winter flows. Notice the willow mattress stabilizing the right bank while also trapping fine sediment.



View of box culvert looking downstream while excavating the asphalt above.



View of project site with culvert removed and bridge installed.



Pre-project view of box culvert looking upstream.



Post-project view of new bridge from same photopoint.



AmeriCorps Watershed Steward Project members, HSU students, and DFG staff involved in various stages of restoration at the McCready project site including fence post hole digging, mulching, willow sprigging, and tying down a right bank willow mattress.



Picture looking downstream after project completion showing right bank fine sediment deposition.



Looking 100ft downstream of bridge at sediment deposition on the willow mattress.



Removing the culvert, looking downstream.



Culvert removed, looking downstream.



Positioning second half of bridge.



McCready dam built for water retention and diversion for the town of Freshwater's drinking supply. Photo taken pre-project looking upstream. Notice the 2.5 ft drop.



View of a notch cut in the dam to improve fish passage and slowly release sediment built up behind the dam..



Notched dam in winter flows allowing easy migration through channel.