Finley Gulch Fish Passage Improvement and Sediment Reduction Project
FINAL REPORT

United States Fish and Wildlife Service – Fish Passage Program
Grant No. 813318J068
July 16, 2010

Partners
California Department of Water Resources
Proposition 40 Consolidated Drinking Water Grant Program
Trinity County Department of Transportation

Prepared By
Christine Jordan and Mark Lancaster, Five Counties Salmonid Conservation Program
on behalf of the Trinity County Natural Resources Division, Weaverville, CA 96093

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Summary

This project improved access to 0.48 miles of habitat for steelhead trout, and potentially coho salmon, by removing an undersized and perched 42-inch diameter, 30-foot long corrugated metal culvert at the Roundy Road crossing of Finley Gulch. The replacement structure is an embedded 84-inch diameter, 34-foot long corrugated metal culvert that reduced the jump height into the culvert from 1.8 feet to 0.45 feet and provides for a natural stream bed through the crossing. The project also increased the crossing's capacity to convey the estimated 100-year flows for the watershed (119 cfs). Metal, plastic and other debris from past mining activity at the site was also removed from the upstream and downstream riparian areas. The project is located in Section 28, T34N, R9W, MDBM, approximately six miles north of Weaverville (Attachment 1- Project Location Map). The crossing is located on Roundy Road at Milepost 0.1, past the bridge over Little Browns Creek. This project was conducted with the full support of the direct upstream and downstream landowners: Paula and Dan Wenzel. The design for the project was completed by 5C staff in consultation with engineering staff at the Trinity County Department of Transportation. Permitting was completed by 5C Program staff, with assistance from State and Federal agencies. Construction was completed by the TCDOT Weaverville road crew and 5C staff. 5C staff has been, and will continue, monitoring the project with assistance from their consulting fisheries biologist and other local, State and Federal Agency staff as needed.

Pre-project photo of perched 42-inch culvert

Post-project natural bottom streambed condition

Background

Given the small size of Finley Gulch and the limited amount of sediment that could deliver to the creek if the crossing failed, this project would not have been economical to construct solely as a sediment reduction project. The relatively low cost required to accommodate fish passage combined with the value of the additional upstream refugia habitat made this an ideal joint sediment reduction/fish passage improvement project. The project also provides the opportunity to experiment with a low cost design modification that retains an outlet pool in the absence of the pool forming characteristic of the perched culvert.

This project is located 230 feet upstream of the confluence of Finley Gulch and Little Browns Creek[1]. Finley Gulch is a small (290 acre) watershed with a relatively narrow, steep and confined stream channel under a moderate to dense canopy of Douglas-fir, white alder, Pacific yew and incense cedar. There is a series of year round cold water pools fed by seeps and springs upstream of the culvert that provide refugia habitat for young of the year and 1+ age class steelhead and other species of fish, especially during drought years. Water temperature in these pools during late summer/early fall is within the 49° - 50°F range. Steelhead are regularly observed in Little Browns Creek and in the culvert outlet pool. A steelhead redd was observed in Little Browns Creek near the confluence with Finley Gulch in March 2009 (Photos 3 and 4) and "*at least ten, 6" to 10" salmonids…were observed in the* [Roundy Road] *outlet pool"* in July 2008 (Taylor, 2008). During the 2007-2009 droughts, the reach of Little Browns Creek upstream of Finley Gulch dried up during the summer months, leaving the Finley Gulch outlet pool as the highest elevation year-round pool refugia in the system. The additional 5-11 pools upstream of the Roundy Road crossing will provide additional refugia during future dry periods.

Project phases include: 1)Purpose and Need; 2) Site Survey and Design; 3) Funding Procurement; 4) Permitting; 5) Construction; and, 6) Monitoring.

Purpose and Need

This project is part of the Five Counties Salmonid Conservation Program (5C), a water quality improvement and fisheries conservation strategy formed by the counties of Del Norte, Humboldt, Mendocino, Siskiyou and Trinity. The 5C was developed in 1997 in response to the listing of coho salmon as Threatened under the federal Endangered Species Act and its fish passage improvement element has been, and continues to be, an essential step toward the delisting of the SONCC coho ESU as a Federal and State listed species. This project also continued a series of many 5C sediment reduction projects targeted at improving water quality by reducing sediment delivery in the Little Browns Creek, China Gulch and Rush Creek watersheds. This project and other 5C work in the SONCC coho salmon ESU also function to restore access to and improve steelhead habitat to avoid the listing of this species as Threatened or Endangered.

It was originally targeted as a sediment reduction project to replace the undersized 42-inch diameter corrugated metal culvert at Roundy Road. The crossing had the potential to divert out of its existing channel and deliver a minimum of 40 yd^3 of roadfill sediment[2] to the downstream reaches of Finley Gulch and Little Browns Creek (determined by Direct Inventory of Roads & Treatments or DIRT sediment source assessment, 2001). In 1997, the culvert overtopped and portions of the roadfill were lost. The diverted flows also flooded a barn located downstream (Wenzel, pers comm., 2009). In 2001, the stream was identified

[1] Finley Gulch is tributary to Little Browns Creek, which is tributary to Weaver Creek and the Trinity River.

[2] Actual sediment delivery from a failed road crossing could exceed the road crossing sediment estimate if significant stream cutting and/or bank scour occurred upstream and downstream of the crossing.

in the DIRT inventory as a non-fish bearing stream, but 5C staff subsequently determined that the outlet pool supported young-of-year and 1+ age class steelhead and/or resident rainbow trout. On May 15, 2008, at the request of the 5C, Forest Service fisheries biologist Loren Everest surveyed the stream and observed: "*seven fish in 150 feet of stream above the culvert. The stream had surface flow for approximately 850 feet upstream of the culvert and water in pools up to about 1700 feet*. *There were no barriers to fish migration observed in the entire 2300 feet surveyed however the stream channel became very small at the upper end.*" It is believed that adult fish were able to move through the culvert under favorable migration flows and spawn upstream of the culvert. On September 23, 2008, the 5C's consulting fisheries biologist Ross Taylor documented 2 steelhead within the 200 foot reach upstream of the culvert and recorded water temperatures 49°F at 0930 hours. Taylor also collected water temperature data for the same reach on October 8, 2009 at 46.5° F at 1030 hours and 50.0°F at 1430 hours.

The undersized culvert created an outlet plunge pool with deep undercut banks on all sides, providing cover and thermal protection for fish and other aquatic species, especially in late summer when surface flows were reduced or disappeared entirely. This pool represents the best habitat in this stream, and the upper portion of Little Browns Creek, and consistently provides summer refugia. The perched culvert assured that the pool would not fill in with sediment (due to plunging flow and scour), but it also prevented upstream access to several additional undercut bank and scour pools. Replacement utilizing the stream simulation method would result in the filling and elimination of this pool within a year or two of project completion, so an adaptive approach of installing an embedded culvert that would maintain at least a small outlet pool was developed.

Adult steelhead in Little Browns Creek, July, 2007

Steelhead redd, March 2009 near the confluence of Little Browns Creek & Finley Gulch

During a normal water year, Finley Gulch has perennial flows through a portion, or all, of its lower 2,000 feet of channel. The values of the stream's perennial pools were documented during the 2007-2009 drought. This drought period is considered the second driest consecutive three year period[3] in the Weaver Creek watershed based on the past 115 years of rainfall records for the Weaverville area (DWR, 2009). Portions of many streams that flow in normal years dried up in the 2007-2009 period including portions of the major Weaver Creek tributaries: Main Stem Weaver Creek, Democrat Gulch, Little Browns Creek, East

[3] While the past 3 years have been the second driest consecutive 3-yr period; there have been five periods of 4-yr or longer droughts including a 4-yr dry period (1917-1920), a severe 10-yr drought (1928-1937), a 7-yr drought (1944-1950), a 4-yr period (1959-1962), and a 6-yr period (1987-1992). There have also been 2, two consecutive year, droughts (1898-99 and 1976-77).

Weaver Creek and Sidney Gulch. Based on rainfall records from the past 115 years, the Weaver Creek watershed will experience drought conditions frequently (36% of the time). Given that low or no instream flows occur during these drought conditions, the cool water refugia pools in Finley Gulch play an important role in fish survival in the upper reaches of the Little Browns Creek watershed.

Based on the observations of fish utilization in Finley Gulch and the past three hydrologic years, two additional goals were integrated into this project that increased its complexity and cost: 1) Improve upstream fish passage, allowing access to upstream summer rearing habitat for steelhead, resident trout and potentially coho salmon; and 2) Retain the existing outlet pool.

Site Survey and Design

Ross Taylor and 5C staff assessed the crossing utilizing the FishXing software (http://www.stream.fs.fed.us/fishxing/software.html). Taylor also recommended design alternatives to improve juvenile fish passage and retain the outlet pool. The FishXing results showed that the 42-inch culvert met adult anadromous salmonid passage criteria on 90.3% of the migration flows (between 5.27 cfs and 26.4 cfs), with a lack-of-depth at lower flows preventing upstream movement. The 1.8-foot elevation drop at the outlet failed to meet passage criteria for resident trout and all age classes of juveniles. Excessive velocities at all flows prevented passage through the existing 5% grade culvert.

Taylor recommended a 60-inch diameter, 30-foot long round corrugated metal culvert with 6" x 2" corrugations set at a 0% slope with the outlet set 1.5 feet lower in elevation than the existing culvert outlet. This configuration would create a slightly perched outlet and a headwall configuration at the inlet. He noted however that this:

"*alternative design was selected to purposely have a slightly perched outlet so that scour during higher flows would likely maintain the crossing's outlet pool since this pool is one of the best over-summering habitats for salmonids on Finley Gulch. FishXing estimated that the alternate design met adult anadromous salmonid passage criteria on 89.9% of the migration flows (5.37 cfs to 26.4 cfs), with a lack-of-depth occurring at lower flows. Reducing the height of the perched outlet and placing the new culvert on a zero-percent slope improved passage conditions for resident trout and age-2+ juvenile steelhead, with the alternative now meeting criteria on 49.2% of the migration flows (between 3.45 cfs and 10.34 cfs). A flow less than 3.45 cfs created a lack-of-depth within the culvert and flows greater than 10.34 cfs created excessive velocities for resident trout and age-2+ juveniles. The alternative design unfortunately still failed to meet the passage criteria for age-1 and young-of-year salmonids due primarily to excessive velocities. Partial passage for these age-classes could be obtained with a counter-sunk culvert; however the probable filling-in and loss of the outlet pool would be considered an unacceptable trade-off for partial passage.*"

Further analysis of the alternative design indicated that it could not be constructed due to the lack of sufficient roadfill depth to accommodate the 60-inch diameter culvert set at the recommended depth and slope while maintaining a minimum 1-foot of roadfill cover (required by the Trinity County Department of Transportation). In addition, the design did not meet two of the three project goals. An experimental design was developed to create a stream simulation crossing that would convey the 100-year flow (119 cfs) using an embedded culvert with a small perched outlet jump (5.5 inches) that could mimic the jumps within the natural channel. The design creates a jump that is two inches higher than that recommended by Taylor. The perched outlet design was also intended to assist in the continued scouring of the channel to maintain the outlet pool.

Funding Procurement

This project was funded by numerous partners in addition to the United States Fish and Wildlife Service including the Trinity River Basin Fish and Wildlife Restoration Program; the California State Water Resources Control Board's Consolidated Drinking Water Grant Program (Proposition 40); the Trinity County Department of Transportation; and Ameri-Corps members working with the Trinity County Resource Conservation District. For detailed budget information refer to Table 1. Attachment 2 includes the original budget that was submitted for this project with the actual budget changes to specific line items notated and described.

Table 1: Grant Funding Allocation by Project Phase

Partners	Finley Gulch Project Expense By Project Phase			
	Engineering/ Permitting	**Construction**	**Monitoring**	**Total**
CA Dept. of Water Resources Consolidate Drinking Water Grant	$ 0	$ 9,837	$ 0	**$ 9,837**
Trinity County Department of Transportation	$ 869	$ 6,675	$ 0	**$ 7,544**
Unites States Fish & Wildlife Service	$ 2,010	$ 24,979	$ 750	**$ 27,739**
Americorps Watershed Stewards Program Staff (Trinity County RCD)	$ 0	$ 192	$ 0	**$ 192**
Total	**$ 2,879**	**$ 41,683**	**$ 750**	**$ 45,132**

Permitting

This project was subject to CEQA and NEPA (due to federal funding sources) and 5C staff completed the environmental review process in cooperation with the USFS, USFWS and NMFS staff. As well as California Department of Fish and Game and Water Board staff. Extensive environmental data was collected for the general project area as part of the Shasta-Trinity National Forest's fuels reduction community protection project known as the 'Browns Project'. The USFS had completed the NEPA on the 'Browns Project' and the biological resource surveys and determinations of their project's effects were concluded prior to the Finley Gulch project analysis. Effects of the Finley Gulch barrier removal were not addressed in the 'Browns Project' EIS however, given that it is located within County right-of-way and bordered by private land. Biological survey information collected for the 'Browns Project' was utilized in conjunction with subsequent County surveys to complete the NEPA and ESA requirements. The project was filed as a CEQA Categorical Exemption under Section 15333 – Small Habitat Restoration Projects (2004 Amendment to CEQA Guidelines, Title 14, California Code of Regulations) and the County obtained a stream alteration agreement (1602 permit) from CDFG. A non-reporting Nationwide 27 Permit from ACOE, a 401 Water Quality Certification from the North Coast Regional Water Quality Control Board, and a NOAA Biological Opinion to address the project's effect on SONCC coho salmon were also issued prior to project construction.

Construction Activities

Aquatic Species Relocation

Fish Relocation was conducted on October 8, 2009 by Ross Taylor and 5C staff. The conductivity was 188 µS/cm and was measured with a Milwaukee C65 conductivity meter. A brief reconnaissance of the project area determined:

1. Fish were visible within the outlet pool downstream of the crossing and none were observed upstream within the project area.
2. There was continuous, albeit minimal, flow within the project area.
3. There were several pools located upstream of Roundy Road suitable for releasing captured fish & amphibians. No suitable pools observed downstream of project area.

At the time of relocation, the outlet pool had a depth of two feet at its deepest point. The water temperature in the pool was 46.5° F at 1030 hours and 50.0°F at 1430 hours. There was minimal surface flow downstream of the outlet pool and there was one pool upstream of Roundy Road within the project area. Several pools were located upstream of the project construction area that were suitable for releasing captured fish and amphibians. Fish exclusion fences were placed above and below the project construction area. The upper screen (hardware cloth supported by several 24" lengths of rebar) was placed 20' upstream of the upper end of the project area. The lower screen was placed at the riffle crest of the outlet pool.

Young of the year steelhead captured upstream during monitoring (Sept 2008)

Fish relocation in the culvert outlet pool (2009)

A Smith-Root, model LR-20 electro-fisher was utilized with an initial setting of DC/200 volts. Two passes were made through the outlet pool, but because of the extensive undercut banks the pool was gradually lowered using a small gas powered Homelite pump (1,900 gallons/hr capacity). Once the outlet pool level dropped, several additional passes were made to capture the remaining fish. During most of the passes, 200 volts was used and on the final passes it was increased to 250 and 300 volts. All captured fish and amphibians were temporarily held in 5-gallon buckets with battery-powered aerators attached, Table 2 below summarizes the results of the relocation effort.

Table 1. Fish Relocation Results, Finley Gulch Migration Barrier Removal Project

	Coastal Rainbow Trout - Young-of-Year	Coastal Rainbow Trout – 1+ Age Class	Coastal Rainbow Trout – 2+ Age Class	Yellow-legged Frog	Pacific Giant Salamander
TOTALS	**0**	**9**	**2**	**0**	**1**

Following fish relocation, 5C staff inspected the fish screens before and during project construction to make sure they remained in place and effective. Observations for impinged fish on the screens were made with no fish observed. The minimal flows in the stream during the 14 days between installation of the screens and commencement of project construction also precluded fish movement into or out of the project area.

General Construction

Construction was completed between October 22 and November 4, 2009 over a period of seven actual working days. Activities consisted of mobilization (move in/out); planned road closure notice and road construction signage; installation of the water diversion; excavation and temporary storage of the roadfill material; cutting the culvert inlet to its beveled condition and cutting the steel v-notch outlet plate; placement of the new structure; sorting and placement of streambed material within the new culvert and jetting the material; installing rock slope protection and grade control; endhauling and storing excess spoils material; importing and placing structural road base; and opening the road to traffic. Equipment used during the project included: an excavator; an extending backhoe; two dump trucks; a vibratory compactor; a manual whacker compactor; a walk behind track loader; a water tender; two gasoline pumps, an arch welder and acetylene torch, and several pick-up trucks.

Road closure notices were posted on October 22. On October 26th a 2" diameter flexible plastic pipe was installed upstream of the project to capture and divert surface flows and the siphon/gravity system discharged the minimal stream flow (~0.01 ft^3/second) into the road drainage system away from the project site. With the diversion in place there was no surface flow through the project work area. On October 27th the existing culvert was excavated along with ~100 cubic yards (yd3) of road fill material and pavement. The excavation left a trench that was lower than the stream channel grade but minimal subsurface flow was encountered and its infiltration rate was sufficient that it percolated through the soil and there was no surface flow or need to pump water out of the work area. The excavated soils were loaded into dump trucks and hauled to a suitable temporary storage site on North Roundy Road. The excess spoils were later hauled approximately 0.1 mile to a flat field owned by the property owner.

A portion of the excavated road fill material was temporarily stored on site for use in the embedded channel stream mix. The 20-foot length, or inlet portion of the culvert, was installed the same day as the excavation and the road was backfilled and reopened to allow for single lane traffic use. The next day, the excavation was extended five feet downstream to accommodate the remaining 14-foot culvert segment (outlet end). This excavation breached the downstream pool but the lack of surface flow prevented any sediment from being transported out of the pool. Once the culverts were connected, road fill was placed over the remaining culvert segment, restoring both lanes of traffic with traffic control delays being used as needed to accommodate construction. The water diversion pipe was directed through the project area at the end of the work day. The rock slope protection was installed on October 29, and streambed material was installed and jetted to compaction between October 30th and November 3rd with the 1602 permit extension granted by CDFG. On November 4th the road was surfaced with asphalt grindings and the road will be repaved in spring 2010 when temperatures allow.

Culvert Installation Detail

The new 84-inch diameter, 34-foot long corrugated metal pipe was installed at a 4.5% grade. The culvert inlet was beveled to increase flow and debris capacity. The culvert was backfilled with D5-D84 sized streambed material; the inlet was embedded approximately

3.75 feet and the outlet was embedded approximately 2.75 feet. A ¼"-thick metal sheet "V" notch plate structure was welded to the outlet in order to provide scour and maintain an outlet pool while still meeting the jump height requirements for juvenile steelhead. The V-notch also contains the interstitial flow within the culvert, allowing for saturation of the streambed material and increasing the surface flow levels in the crossing, thereby extending the period that fish can move up or downstream. This condition will result in surface flows within the crossing being similar to the natural condition encountered upstream of the crossing. Three inches of 3 inch minus rock was placed over the jetted streambed material with the intent of it moving into the culvert during the first high flow period. 1/4-ton to 1-ton angular boulders were placed at the inlet and in the outlet pool to maintain grade and reduce the potential for upstream headcutting.

Streambed Construction Detail

Streambed material ranging in particle size from silt to boulders (16" diameter class) was placed in the culvert using a backhoe. At the inlet, streambed material was placed with an excavator and then pushed into the culvert with the backhoe bucket and extended hoe. At the outlet, a plywood chute was used to feed material into the pipe. The material was distributed and placed using a Toro walk behind tracked loader, manual placement, and jetting with water. A water truck with a high pressure pump and 1½" hose was used to jet the streambed mix at the rate of ~90 gallons per minute at ~150 psi. The welded metal V-notch at the outlet retained most of the turbid water associated with jetting and a 3-inch diameter trash pump was used to pump the turbid water into a vegetated swale. Discharge was monitored constantly to assure no delivery to Finley Gulch. At the peak of jetting activity, minimal turbidity was observed in three pools just downstream of the confluence with Little Browns Creek but no deposited sediment was observed in the pools during subsequent inspection. At the completion of the jetting process, the outlet pool was washed with low pressure hoses and water was continuously pumped to remove any accumulated sediment within the pool. Washing was done until the water in the pool was clear and no sediment was visible on the rocks and stream flow was permanently returned through the crossing at that time. Monitoring of the pool and water quality was conducted both as the outlet pool refilled and after the first several rainstorms, during which time, no turbidity or visible sediment transport was observed in the stream.

All water quality measures described in the project plans and permits were utilized to protect water quality against any accidental sediment and/or petroleum discharge to the stream. All disturbed areas were mulched with native pine needle mulch on November 4, 2009.The area was seeded with native grass seed and re-mulched in mid December 2009. Non-native vegetation removal was completed along the downstream reaches on April 1, April 10 and April 23 with assistance from the California Conservation Corps. The primary species removed was cut leaf blackberry (*Rubus laciniatus*). Re-plating with cottonwood, red willow, and native grasses (see Attachment 3 – Photo Log) was completed.

In addition to the crossing upgrade, approximately 1,000 pounds of mining and cabin debris were removed from the riparian areas up and downstream of the crossing (see below).

Stream Clean Up

On October 23, 2009, AmeriCorps members with the Trinity County Resource Conservation District and 5C staff members conducted a stream clean-up of approximately 800 feet of stream channel upstream of the project site. The site had been a mining claim and cabin site from the late 1890's to the 1980's and materials from those uses were concentrated in or near the stream. Over 1,000 pounds of metal, plastic, rubber and other debris was removed from the streambed and bank during this effort. Materials removed included: an

engine transmission, vehicle body parts, a 55-gallon drum, a washing machine, tires and wheels, aluminum and metal wire, rope, aluminum siding, chicken wire fencing, a toilet, tin cans, plastic and metal pipes, and lumber.

Danny McKnight (AmeriCorps) uses a come along winch to pull a transmission housing partially buried in the stream channel

Debris removed from the stream and riparian areas

MONITORING

Pre, during and post-project monitoring consists of photo-points; presence/absence surveys; and a pre and post-project longitudinal thalweg profile.

Photo Monitoring: A photo-monitoring program to determine the project's effectiveness was developed and is being continually implemented. Project monitoring began in 2007 with a series of pre-project photos. These photos were supplemented in 2009 with additional pre-project as well as during and post project photo monitoring photos. 5C staff will continue to photo-document the site as storms occur in 2009 and 2010, and throughout the following year to monitor flow conditions as well as revegetation success (see Attachment 3).

Physical Monitoring: Pre-project longitudinal and thalweg surveys were completed in September 2008 and were utilized for the design of the project. A post-first winter survey will be completed to document channel adjustments (Attachment 4). The original culvert was assessed using FishXing software as a complete barrier for resident trout and all juvenile age classes of steelhead due to the perched outlet and excessive velocities at all flows.

Stream temperature monitoring has been limited but has indicated that water temperatures are favorable for fisheries during some of the lowest flows. On September 23, 2008[4], biologist Ross Taylor recorded a water temperature of 49°F at 0930 hours in a pool upstream of the project site. Taylor collected water temperature data for the same area on October 8, 2009[4] with temperatures being 46.5° F at 1030 hours and 50.0°F at 1430 hours. 5C staff will conduct additional temperature monitoring during the summer months.

TCDOT will maintain the new crossing. During high rainfall/storm events, the new structure

[4] The maximum and minimum temperatures recorded in Weaverville for 9/28/2008: 89°F and 48°F and 10/8/2009: 79°F and 45°F. Given the approximately 600' difference in elevation of the project site to the Weaverville weather station location, the actual on-site air temperatures would be slightly lower than reported.

will be inspected in a timely manner and debris will be removed if necessary. This project will provide both short and long-term objectives of reducing culvert maintenance costs and emergency response time for the TCDOT maintenance crews and engineers.

Biological Monitoring:
Initial survey data upstream of the culvert outlet pool was collected on May 15, 2008 in anticipation of this project being constructed. This effort consisted of a rapid presence and absence survey and habitat assessment by US Forest Service biologist Loren Everest. That survey resulted in the observation of seven fish within 150 feet upstream of the culvert. The stream had surface flow for approximately 850 feet upstream of the culvert and water in pools up to about 1,700 feet at that time. A more intensive survey was conducted by Ross Taylor, consulting biologist and Christine Jordan (5C staff) on September 23, 2008 using a Smith-Root, model LR-20 electro-fisher. The stream had surface flow for 350 feet upstream of the culvert and water in pools for an additional 300 feet. A total of 11 pools within 650 feet upstream of the outlet pool were sampled with two one year age class steelhead being caught, photographed and released. Post project presence/absence surveys will be conducted at the project site during May and September 2010 and potentially in subsequent years. The first post-project presence/absence survey is planned for July 2010. The start of the survey will be at the confluence with Little Browns Creek and will extend to the upper limits of habitat, approximately 0.5 miles upstream.

Quantitative Results

A. Stream length treated/assessed/made more accessible (distance in feet): **~2,300 feet and ~1,000 pounds of metal and other debris were removed from 800' of stream**
B. Instream habitat structures to be installed (number): **A 12" diameter tree originally planned to be installed was eliminated from the project design**
C. Fencing length to be installed/repaired (distance in feet): **0**
D. Road length treated/assessed (distance in miles): **0**
E. Stream crossings treated (number): **1 crossing**
F. Sediment prevented from entering the stream (volume in cubic yards): **A minimum of 40 cubic yards and potentially more if the channel banks or channel bottom scour were to occur as a result of culvert failure**
G. Trees planted (number): **70 trees**
H. Area planted/preserved/assessed (area in acres): **0.14 acres**
I. Public meetings (number): **0 as a Public meeting was not required. The CEQA Categorical Exemption was posted for 31 days in the Trinity County Courthouse with no comments received**
J. Public meeting attendees (number): **Not applicable**
K. Students trained (number): **0**
L. Juvenile fish produced: **0** released: **0**

List of Attachments

Attachment 1 – Project Location Map

Attachment 2 – Original Detailed Budget with Changes for Construction

Attachment 3 – Project Photo-log

Attachment 4 – Design & As Built Drawings

Finley Gulch Fish Passage Improvement & Sediment Reduction Project
Rush Creek Lakes USGS 7.5 Minute Quadrangle
Section 28, T34N, R9W, MDB&M

Attachment 1 - Project Location Map for Finley Gulch Fish Passage Improvement & Sediment Reduction Project USFWS Grant No. 813318J068

FINLEY GULCH FISH PASSAGE IMPROVEMENT & SEDIMENT REDUCTION PROJECT APPROVED BUDGET							Actual Grant And Cost Share Expenditures, Changes in Amounts, and Explanation				
				Amount Requested	Amount Cost Share	Project Total	Grant Amount Expended	Cost Share Amount Expended	Change in Grant Expenditure	Change in Cost Share Expenditure	Explanation of Changes
PERSONNEL EXPENSES											
Level of Staff	No. of Hours	Hourly rate									
Project Manager I	40	$33.00		$1,320	$0	$1,320.00	***$ 1,931***	***$ 1,964***	***$ 611***	***$1,964***	*Increase in Grant Expenditure and Cost Share Expenditure due to additional time required to administer construction (this work also matched with other Grant Source in Cost Share)*
Benefits at		66.64%		$880	$0	$879.65	***$ 1,280***	***$ 1,349***	***$ 401***	***$1,349***	
Project Manager II	35	$30.30		$ 1,061	$ -	$ 1,061	***$ 602***	$ -	***$ (459)***	$0	*Decrease in Grant Expenditure due to less time worked on the Project overall*
Benefits at		61.38%		$ 651	$ -	$ 651	***$ 1,640***	$ -	***$ 989***	$0	
Project Manager II	35	$26.11		$ 914	$ -	$ 914	***$ 1,847***	$ -	***$ 933***	$0	*Increase in Grant Expenditure due to time required to administer construction & revegetation activities and reporting*
Benefits at		53.96%		$ 493	$ -	$ 493	***$ 1,053***	$ -	***$ 560***	$0	
Project Accountant	8	$20.50		$ -	$ -	$ -	***$ 164***	$ -	***$ 164***	$0	***Increase in Grant expenditure due to 5C Accountant not being included in the Original Budget, but worked on Project so factored in***
Benefits at		62.63%		$ -	$ -	$ -	***$ 103***	$ -	***$ 103***	$0	
Trinity County DOT Engineering Benefit Rate	12	$72.39		$ -	$ 869	$ 869	$ -	$ 869	$ -	$0	*NA*
Trinity County DOT Road Crew Staff	90	$26.00		$ 832	$ 1,508	$ 2,340	***$ 1,500***	$ 1,508	***$ 668***	$0	*Increase in Grant Expenditure due to time required to construct project*
Benefits at		52.00%		$ 433	$ 784	$ 1,217	***$ 780***	$ 784	***$ 347***	$0	
Americorps Personnel	16	$12.00		$ -	$ -	$ -	$ -	$ 192	$ -	***$192***	***Increase in Cost Share expenditure due to Americorps Staff not being included in the Original Budget, but worked on Project so factored in***
TOTAL PERSONNEL EXPENSES				**$ 6,583**	**$ 3,161**	**$ 9,744**	***$ 10,899***	***$ 6,665***			
OPERATING EXPENSES											
Description											
Subcontractors	# Units	Units	Unit Price								
Install exclusion fencing & relocate aquatic species	16	HRS	$ 65	$ -	$ 1,040	$ 1,040	$ -	***$ 599***	$ -	***$ (441)***	*Decrease in Cost Share expenditure under Cost Share due to less time required to conduct fish relocation activities*
Materials, Supplies, Operating											
Clearing & Grubbing	5	HRS	$ 75	$ -	$ 375	$ 375	$ -	$ 375	$ -	$ -	*NA*
Excavate 15' x 6' x 1.5' upslope to align crossing with channel	5	CY	$ 75	$ 375	$ -	$ 375	$ 375	$ -	$ -	$ -	*NA*
Structural Excavation	30	CY	$ 75	$ 1,150	$ 1,100	$ 2,250	$ 1,150	$ 1,100	$ -	$ -	*NA*
Install 84-inch culvert (10-gauge CMP)	40	LF	$ 167	$ 6,680	$ -	$ 6,680	***$ 671***	***$ 6,009***	***$ (6,009)***	***$ 6,009***	*Note that there is an even Decrease in Grant & and an even Increase in Cost Share expenditure due to a matching grant source that reimbursed the $6,009 culvert purchase so only labor was billed*

FINLEY GULCH FISH PASSAGE IMPROVEMENT & SEDIMENT REDUCTION PROJECT APPROVED BUDGET							Actual Grant And Cost Share Expenditures, Changes in Amounts, and Explanation				
				Amount Requested	Amount Cost Share	Project Total	Grant Amount Expended	Cost Share Amount Expended	Change in Grant Expenditure	Change in Cost Share Expenditure	Explanation of Changes
Install Structural Backfill	36.30	CY	$ 50	$ 1,815	$ -	$ 1,815	**$ 3,950**	$ -	**$ 2,135**	$ -	*Increase in Grant expenditure due to fact that the Engineered Streambed Material (24 cyds) was not included in the original budget but was used so is lumped in with the Structural Backfill (55cyds)*
Install Concrete Slurry to Surface Road	6	CY	$ 30	$ 194	$ -	$ 194	**$ -**	$ -	**$ (194)**	$ -	*Decrease in Grant expenditure due to the fact that road has not been resurfaced but is still gravel*
Install grade control (1/2-ton RSP)	6	Ton	$ 200	$ 1,200	$ -	$ 1,200	$ 1,200	$ -	$ -	$ -	*NA*
Install construction area signage	1	LS	$ 175	$ -	$ 175	$ 175	$ -	$ 175	$ -	$ -	*NA*
Install stream diversion & floating oil absorbent boom	1	LS	$ 1,800	$ 900	$ 900	$ 1,800	$ 900	$ 900	$ -	$ -	*NA*
Install Temporary Detour (steel plate)	1	LS	$ 500	$ 250	$ 250	$ 500	$ 250	$ 250	$ -	$ -	*NA*
Install Hydrologic Connectivity at Upstream Spring	1	LS	$ 2,500	$ 2,500	$ -	$ 2,500	$ 2,500	$ -	$ -	$ -	*NA*
Erosion Control & Revegetation with Native Species	1	LS	$ 2,000	$ 1,940	$ -	$ 1,940	$ 1,940	$ -	$ -	$ -	*NA*
Mobilization	1	LS	$ 3,167	$ 3,167	$ -	$ 3,167	**$ 2,919**	$ -	**$ (248)**	$ -	*Decrease in Grant Expenditure due to lower costs to move in equipment & supplies*
Project Signage	1	LS	$ 175	$ 175	$ -	$ 175	$ 175	$ -	$ -	$ -	*NA*
Equipment Rental & Purchase	***1***	***LS***	***$ 369***	***$ -***	***$ -***	***$ -***	***0***	***$ 369***	***$ -***	***$ 369***	***Increase in Cost Share due to machine rental & supplies not being included in the Original Budget, but was used for Project so factored in***
Project Travel	***1***	***mi***	***$ 0.50***	***$ -***	***$ -***	***$ -***	***0***	***$ 147***	***$ -***	***$ 147***	***Increase in Cost Share due to Mileage not being included in the Original Budget, but expended on Project so factored in***
Permits & Licenses											
401 Permit	1	LS	$ 60	$ 60	$ -	$ 60	$ 60	$ -	$ -	$ -	*NA*
CDFG 1600 Permit	1	LS	$ 750	$ 750	$ -	$ 750	$ 750	$ -	$ -	$ -	*NA*
TOTAL OPERATING EXPENSES				**$ 21,156**	**$ 3,840**	**$ 24,996**	***$ 16,840***	***$ 9,924***			
SUB TOTAL OPERATING & PERSONNEL EXPENSES				**$ 27,739**	**$ 7,001**	**$ 34,740**	***$ 27,739***	***$ 16,589***			
TCDOT ADMIN. OVERHEAD AT 15%				$ -	$ 1,050	$ 1,050	$ -	$ 984	0	$ 66	*Decrease in TCDOT Admin Expenditure due to matching Grant source use & mobilization/surfacing costs were less than originally budgeted*
TOTAL BUDGET				**$27,739**	**$8,051**	**$35,790**	***$27,739***	***$17,573***	***$45,312***	*There was no change in the Grant Budget Amount overall, only Cost Share to increase the total Cost of the Project by $9,522*	

COST SHARE DESCRIPTION	
Original Source & Cost Share Total:	Trinity County Department of Transportation = $8,051.00
Changes & Explanation of Change:	$17,753 expended due to additional grant available for Cost Share & Americorps Stewards working on Stream Clean-Up (TCDOT portion reduced due to County Budget shortfall)
Amount & Source of Cost Share	**38.78% of the Total Project Cost is from the following Cost Share Sources:**
$7,544	Trinity County Department of Transportation
$9,837	Consolidated Drinking Water Program (State Water Resources Control Board grant under Proposition 40)
$192	Americorps Watershed Stewards Program Staff (Trinity County RCD)

Upper Left - Inlet view before and after (right). Middle Left- View of inlet from channel right before and after (November 4, 2009) Bottom Left- Inlet view (channel left) before and after (right photo)

Top Left - Pre-project view of outlet pool and top right post project (February 3, 2010). Middle Row Left - Outlet pool before project from right bank and after (12/12/2009) (Right). Lower Left- Outlet before. Lower Right - after (11/4/2009).

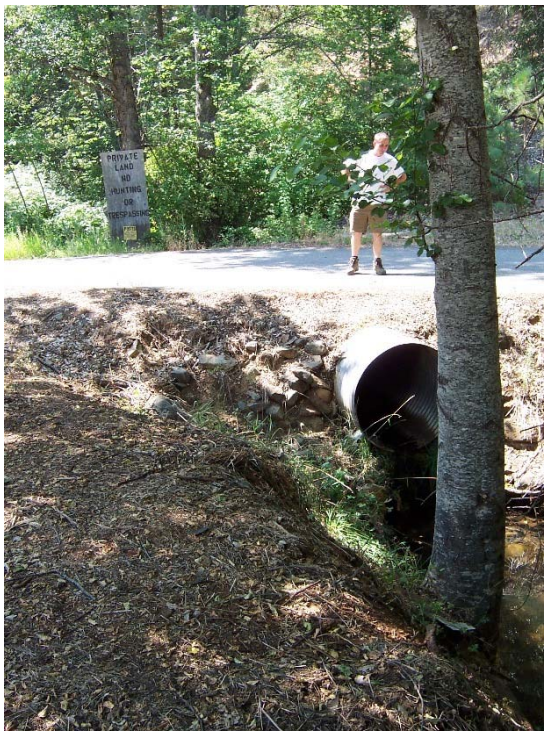



Photo Series 1: Before (upper left), during construction (upper middle and right and lower left photos) and after (lower right photo)


Photo Series 2 (Pictures 1-6): Before and during construction of Finley Crossing including before(upper left); excavating out the 42" CMP (upper middle and right); preparing the bed for the new CMP (lower left) and placing the first segment and band (Lower middle and right). All photos taken October 27, 2009)

Photo Series 2 (Pictures 7-9): Left: Outlet showing the steel plate during jetting and placement of bedload material (November 1, 2009). Middle: Outlet after bedload material has been placed and jetted and rock slope boulder placed (November 3, 2009). Right: Outlet flow during the receding end of a winter storm (February 2, 2010)


Photo Series 3: Post Project Outlet and Pool Monitoring. Upper left Photo (November 4, 2009); Upper right: December 3, 2009. Lower Photo: February 2, 2010.

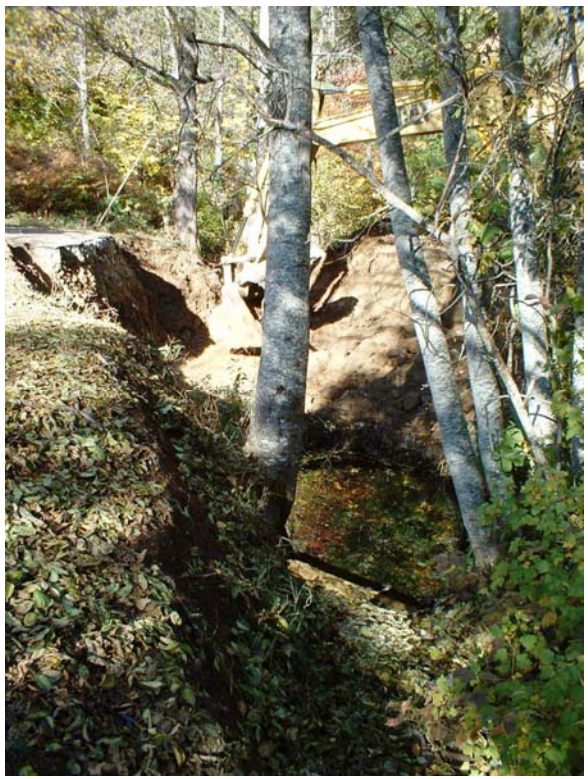
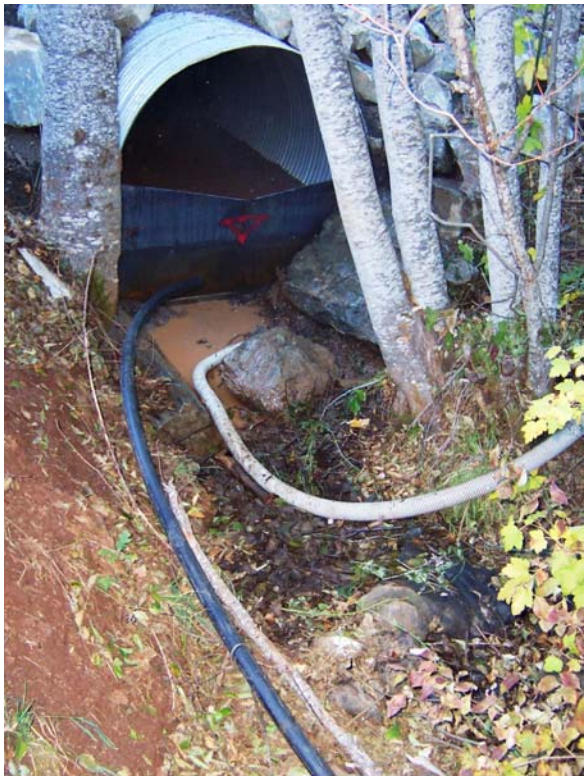
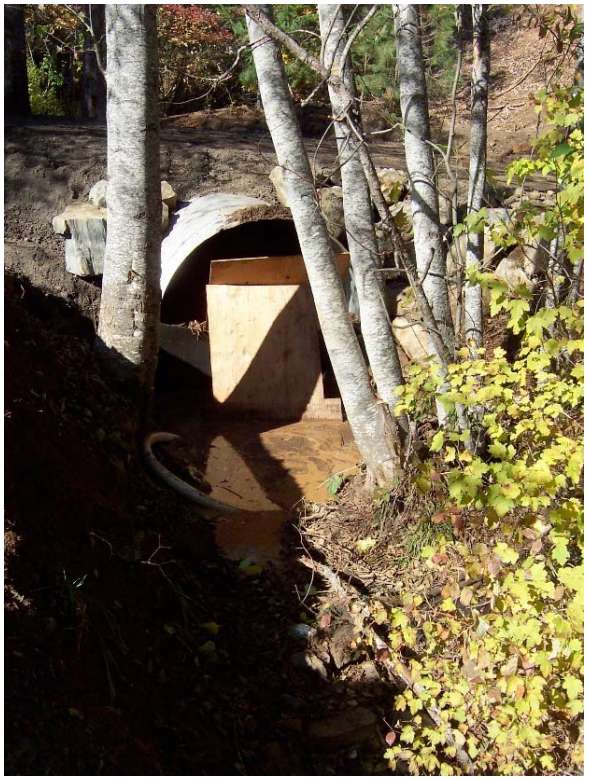




Photo Series 4: Water Quality Monitoring: There was minimal surface water flow during the project. Surface flow was routed around the site in a 2" HDPE pipe. Upper left Photo the outlet pool was protected during construction by retaining a 4' wide portion ot the pre-project perched streambed forming a barrier between the work area and any water (not he pool in the lower 1/3 of the photo). Upper middle and right photos and lower left photo- during jetting of streambed material all water was pumped out of the pool. Lower right photo- Once jetting was completed the pool was washed with a low pressure hose to remove all sediment before fow was routed back into stream.


Photo Series 5: Installing streambed Mix: Upper left- CMP w/plate ready to install; Upper middle- the inlet is filled with mix. Upper right- inlet mix beginning to be fed into CMP. Middle left and center photos- feeding streambed mix into culvert. Middle right photo- ramp to feed mix into outlet end of CMP. Lower left and right photos- distributing mix. Lower middle- pressure washing mix in culvert.

Photo Series 6: Placing streambed mix (Upper left). Mix immediately after completion of jetting on November 3rd, 2009 (upper right). Mix after first high flows February 3rd, 2010 (lower)



Photo Series 7: Miscellaneous construction photos





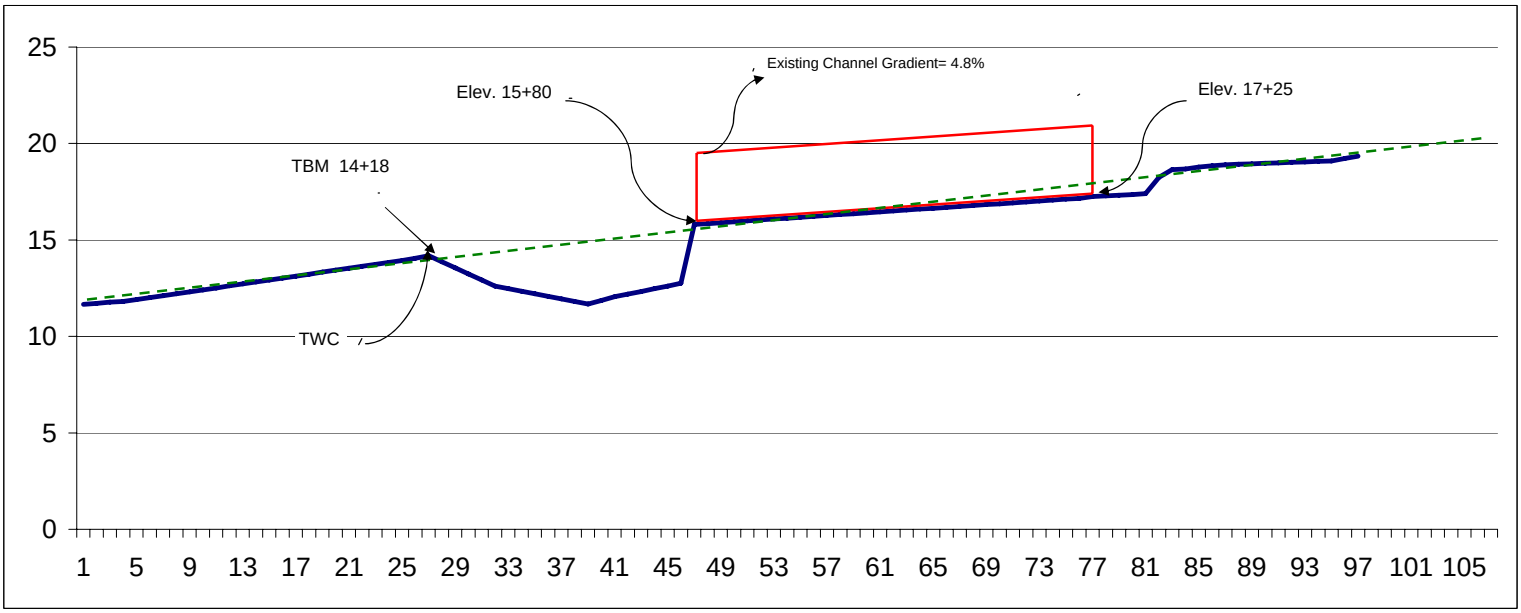

Photo Series 8: View of outlet: Before and during showing upstream channel & culvert and plate in place but no flow or rock slope protection in place. Lower Right is following winter storm flows of January & early February 2010

Photo Series 9: Removal of non-native cut-leaf blackberry and revegetation with grasses and riparian tree species with assistance fro the California Conservation Corps:

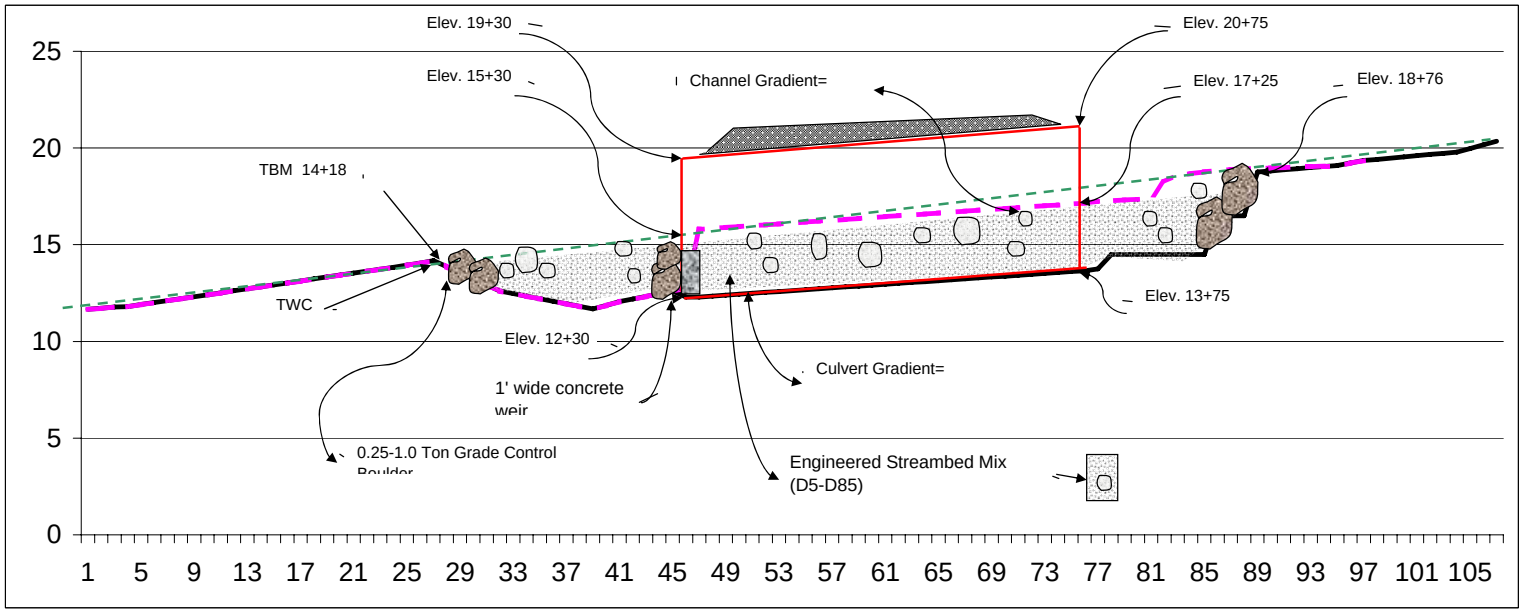
Photo Series 10: Post project monitoring photos of the culvert outlet, interior & fish use upstream of the culvert (July 13, 2010)

YOY class Steelhead just upstream of the Culvert inlet (July 13, 2010)

EXISTING



DESIGN



AS-BUILT