



Restoring Fish Passage at Road-Stream Crossings

2005 Accomplishment Report



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Forest Service

Pacific Southwest Region 2005

From the Director of the Ecosystem Conservation Program

I am pleased to share the results of another very successful year of our programs to improve fish passage at road-stream crossings. This work is an important part of our Regional Program of Work. These fish passage projects provide immediate benefits to salmon, trout, and other aquatic organisms by reestablishing access to many miles of stream habitat.

In fiscal year 2005, seven projects were completed, which together opened access to more than 11 miles of quality habitat. Congressional fish passage funding supported about 62% of the work, while partnerships and leveraged funding, from a variety of sources, accounted for the remainder.

These accomplishments are the result of teamwork. This is reflected in the cooperation, coordination, and partnerships with many others including Federal and State agencies, Tribal and County governments, numerous Watershed Councils, many local landowners, and non-governmental organizations. All have come together to help restore aquatic habitat and healthy runs of salmon and trout to entire watersheds, one at a time. Please take a moment to find out more about this exciting and important work.



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Table of Contents

FY2005 Program.....	1
Example of a Typical Construction Project- Ti Creek, Six Rivers National Forest	2
Partnerships.....	3
Before and After Photos of Selected 2005 Projects.....	4
Upper North Fork Antelope Creek, Lassen National Forest.....	4
Upper Elk Creek, Klamath National Forest.....	5
Ti Creek, Six Rivers National Forest.....	6
Tule Creek, Shasta-Trinity National Forest.....	7

FY2005 Program in the Pacific Southwest Region

Region 5 projects funded by the Congressional Fish-Passage Earmark are shown below in Table 1. All projects were awarded except for the Goods Creek project on the Shasta-Trinity NF. Preconstruction work for Goods Creek is complete however it could not be awarded before the fiscal year obligation cutoff date. The project will be advertised as soon as funds are available in Fiscal Year 2006. The FY05 program includes obligation of \$393,000 of Congressional Earmark funding for replacement of fish-passage barriers at 3 road-stream crossings, re-establishing access to 5.3 miles of stream habitat (see Table 1). In addition, \$58,000 of earmarked funds were used to start preconstruction work on six anadromous fish passage projects in the Klamath River Basin that will be ready for award in FY 2006. The Goods Creek project will re-establish an additional 3 miles of stream habitat when it is awarded and use the remaining earmarked funds allocated to the Region. These accomplishments represent implementation of an ambitious program to complete high priority fish passage projects in the Region.

Table 1: FY05 Fish Passage Construction Projects Funded by Congressional Earmark in Region 5

National Forest	Project Name	River Basin	Miles of New Accessible Habitat	Species of Interest
Klamath	East Fork of South Fork Salmon	Klamath	2.5	St, Rt
Klamath	Grouse Creek	Klamath	1.1	St, Rt
Klamath	Trail Gulch	Klamath	1.7	St, Rt
Shasta-Trinity	Upper Hayfork- Goods Ck	Klamath	3.0	Co, Ch, St, Rt
Six Rivers	Ti Creek	Klamath	1.0	St, Res
Totals			9.3	

Ch = Chinook salmon Co = Coho salmon St = Steelhead Rt = Resident trout

Region 5 has replaced 22 fish-passage barriers, re-establishing 43.2 miles of steam habitat, in the Klamath River Basin using Congressional Fish Passage Earmarks since FY 2003. The accomplishments by year are shown below in Table 2. The elimination of barriers has benefited steelhead, chinook and coho salmon, rainbow trout and other aquatic organisms. The Shasta-Trinity and Klamath national forests are prepared to award contracts in FY '06 to remove seven barriers, re-establishing 11.4 miles of stream habitat, if funding becomes available.

Table 2: Multi-Year Summary of Fish Passage Projects Funded by Congressional Earmark in Region 5.

Fiscal Year	Number of Crossings	River Basin	Miles of New Accessible Habitat	Species of Interest
FY '03	5	Klamath	12.8	Co, Ch, St, Rt
FY '04	13	Klamath	22.1	Co, Ch, St, Rt
FY '05	4	Klamath	8.3	Co, Ch, St, Rt
Totals			43.2	

Construction- An example of several stages of a culvert replacement project on Ti Creek, tributary to the Klamath River, Six Rivers National Forest in partnership with the Karuk Tribe.



Above- Contractors construct the new channel bed elevation for the new culvert, which will be embedded 3 feet below the existing channel bed elevation. The stream was routed around the construction site using a hose lay and portable pump.



Above- Left, contractors placing a section of culvert and right, a finished view from inside the new culvert.



Above- The Karuk Tribe completes installation of the grade control structure.



Partnerships

In addition to the specific fish passage projects described in this accomplishment report, Region 5 has also benefited by working in partnership with other federal, state and county agencies, as well as non-profit organizations. This year Region 5 joined 12 other signatories on a Memorandum of Understanding, which created the Fish Passage Forum. This MOU was part of the California Resources Agency's effort to implement an eight point California Coastal Salmon and Watersheds Program, which included an objective to coordinate fish passage activities. This MOU supports voluntary, cooperative efforts with the objective of protecting, restoring and maintaining watershed and estuarine conditions to promote the creation of conditions that will enhance passage of anadromous fisheries. The Forum will achieve these goals by identifying and correcting barriers to fish passage by ensuring that crossings are properly designed, and advancing public awareness of fish passage issues to develop support for these efforts.

One product born of this partnership is the District 1 Pilot Fish Passage Assessment Study. This study was performed by Dr. Margaret Lang of Humboldt State University and her associated partners, and funded by the California Department of Transportation (Caltrans) with the intention of identifying State Highway System culverts that blocked or impeded upstream or downstream passage of anadromous salmonids. The geographic limits of the pilot study were the coastal counties of Del Norte, Humboldt, and Mendocino in Caltrans District 1. More than 800 miles of State Highway were evaluated and 411 potential fish passage sites were identified. Some sites were eliminated because they did not support fish or landowners did not grant access. As of December 1, 2004, 312 of these sites had been surveyed and analyzed using the California Department of Fish and Game's assessment protocol to identify potential impediments to fish passage including high water velocities, low water depths and excessive leap heights over the range of fish passage flows. Based on this survey 186 (60%) do not meet current fish passage guidelines for existing culverts and present a severe impediment to fish passage, 99 sites (32%) are likely to present difficult passage conditions under some conditions or for some of the target fish; and 27 sites (9%) provide good passage conditions for all species and lifestyles of fish over the full range of fish passage flows. Members of the Fish Passage Forum were able to use the results from the Caltrans study to prioritize where fish passage projects in District 1 will be concentrated in the immediate future. Criteria used to identify highest priority sites included the magnitude of the barrier, the number and type of fish species that could benefit by alleviating the barrier, and the extent of potential suitable habitat above the barrier.



Before and After Photos of Selected 2005 Projects

Open Bottom Arch

Upper North Fork Antelope Creek, tributary to the Sacramento River

Lassen National Forest- Partnership Funded (CalFed)

Project

An impassible undersized (5' diameter) culvert was removed and replaced with an open-bottom arch culvert (18' span x 8' rise).



Before

Benefits

The improved structure restores access to 2.0 miles of habitat for native rainbow trout, provides capacity to pass 100-year storm flows and associated coarse woody debris, reduces risk of road failure and the potential for increasing fine sediment transport to anadromous habitat downstream, and facilitates the natural routing of bedload thus improving downstream anadromous habitat.



After

Open Bottom Box Culvert

Upper Elk Creek, tributary to Elk Creek
Klamath National Forest

Project

The purpose of this project was to rehabilitate the Upper Elk Creek culvert crossing sufficient to provide unrestricted passage for all aquatic species. The 9 ft x12 ft steel arch culvert was replaced with a 28 ft span x 8 ft high aluminum, open bottomed box culvert. The crossing was originally designed to pass a 25-year storm event and is now upgraded to pass 100-year storm flows.

Benefits

The new crossing provides access to approximately 1.3 miles of fish habitat, including 0.1 miles of anadromous stream, was blocked by the existing structure. The new crossing provides unrestricted access through the crossing for coho, steelhead, resident rainbow, Pacific lamprey, and Pacific giant salamanders and other aquatic species. The new structure has also added capacity to pass flows and associated debris, becoming less prone to failure.



Before



After

Embedded Culvert

Ti Creek, tributary to Klamath River

Six Rivers National Forest

Project

Replace perched, undersized culvert with an embedded culvert. Provide passage by placing a new 12-foot diameter culvert 3 feet below the existing channel elevation to eliminate the 4-foot drop at the outlet and reconstruct the channel bottom through the culvert to simulate a more natural streambed.

Benefits

Construction reduced the potential for upstream channel adjustment by gradually stepping up the channel gradient to match the existing profile above the construction site. It provides access to one mile of spawning and over-wintering habitat for steelhead and resident trout. The culvert was designed to accommodate a 100-year storm event.



Before



After

Concrete Bridge

Tule Creek, tributary to Salt Creek
Shasta-Trinity National Forest

Project

Replace a 72-inch, corrugated steel culvert with a creek-spanning concrete bridge. The culvert outlet had scoured a deep hole that caused the water level to be about 3 feet below the bottom of the culvert during low flows.

Benefits

The new structure has restored capacity to pass flows and associated debris and no maintenance will be required in the future to remove lodge debris. In addition, the volume of fill material (~2,000 cubic yards) has been removed and no longer poses a threat to aquatic habitat downstream. Access to two miles of habitat has been reestablished for steelhead, resident rainbow, Pacific lamprey, and Pacific giant salamanders.



Before



After

Acknowledgements

The photograph on the front cover was taken by Thomas Dunklin, who kindly granted permission to use it in this report.

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