

Appendix E-1



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southwest Region
777 Sonoma Ave., Room 325
Santa Rosa, California 95404-4731

COPY

September 15, 2010

In response, refer to:
2006/07316:WH

ORIGINAL DOCUMENT
SONOMA COUNTY WATER AGENCY

To *MANNING*
LUED
SEP 17 2010

CF/45-5-7-2 Willow Creek Fish Passage Enhancement Project

Grant Davis, General Manager
Sonoma County Water Agency
404 Aviation Boulevard
Santa Rosa, California 95403

RE: Willow Creek Fish Passage Enhancement Project

Dear Mr. Davis;

As you are aware, NOAA's National Marine Fisheries Service (NMFS) issued the *Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed* (Russian River BO) on September 24, 2008. The Russian River BO is a culmination of more than a decade of consultation between the Sonoma County Water Agency (SCWA), the U.S. Army Corps of Engineers (Corps), and NMFS regarding the impact of the SCWA's and Corps' water supply and flood control activities on three fish species listed under the federal Endangered Species Act: Central California Coast steelhead, Central California Coast coho salmon, and California Coastal Chinook salmon. The California Department of Fish and Game (CDFG) issued a consistency determination on November 9, 2009, finding that the Russian River BO was consistent with the requirements of the California Endangered Species Act (CESA) and adopted the measures identified in the Russian River BO.

One component of the reasonable and prudent alternative (RPA) identified in the Russian River BO is the enhancement of salmonid rearing habitats in tributaries to Dry Creek and the Russian River (Page 267, Russian River BO). A total of ten potential tributary enhancement projects are listed in the Russian River BO with the requirement that SCWA implement at least five of these projects by the end of year 3 of the 15 year period covered by the Russian River BO. One of the projects listed is the Willow Creek Fish Passage Enhancement Project, as described below:

"Willow Creek is a tributary to the lower Russian River that once supported an abundant subpopulation of coho salmon. The creek continues to support significant potential spawning rearing habitat; however, access to that habitat is blocked by impassable road culverts and a shallow braided channel that passes through forested wetland. DFG has identified artificial structures that are passage barriers for one or more life stages of anadromous salmonids within the Willow Creek Watershed. A Sonoma County road crossing culvert has been identified as a complete barrier to salmonids and a partial barrier to bedload associated with impacted watershed conditions. DFG has funded road improvement projects on



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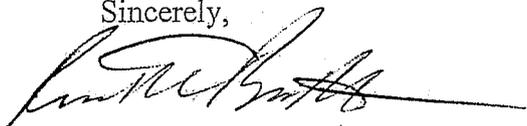
private and public roads to reduce non-point source sediment and non-profit entities have implemented improvements to point-source sediment sources. The California State Parks and Stewards of the Coast and Redwoods, a non-governmental environmental organization, have funded the engineering design and completion of the CEQA document for the improvement of fish passage opportunity at the "2nd Bridge" on Willow Creek. The 80% engineering design is scheduled for completion by May 2008; CEQA documentation is scheduled for completion by September 2008. The project will likely be able to be constructed during 2008; however, the remaining engineering design and project construction will need funding. SCWA will support this fish passage enhancement project by State Parks by funding \$100,000 of the construction costs. This project will help restore adult coho salmon and steelhead access to 9480 m² of spawning and rearing habitat for these species. The passage project will improve passage for adult salmonids by a 50% improvement factor (B.Coey, DFG, personal communication)." Pages 270-271, Russian River BO.

To implement the Willow Creek Fish Passage Enhancement Project, the SCWA intends to contribute \$100,000 in funding to Trout Unlimited towards the removal of a complete barrier in Willow Creek. A copy of the proposed scope of work to be funded by the SCWA is enclosed. The project will restore passage to 7.3 and 4.7 miles of historic steelhead and coho spawning and rearing habitat, respectively, for all life stages by replacing 6 culverts and a bermed roadway with a 43-foot, single-span bridge. SCWA funding will be used to cover the cost of pile installation and rough grading and culvert removal associated with the bridge construction.

- **Pile installation:** Procure materials, stake locations, drive piles through existing road bed, cut piles to existing roadbed surface. Cost: \$74,364
- **Rough grading and culvert removal:** Remove and off-haul asphalt, remove existing culverts, over excavate and compact bottom of cut for approach roads, install engineered fill to approach road subgrade, install culvert, rough grade channel, establish abutment bypass lane for construction vehicles. Cost: \$25,636

This letter confirms that SCWA's contribution of \$100,000 to Trout Unlimited towards construction of a new bridge on Willow Creek as described above and in the enclosed scope of work constitutes SCWA's completion of Willow Creek Fish Passage Enhancement Project as described in the Russian River BO.

Sincerely,



Dick Butler
North Central Coast Office Supervisor
Protected Resources Division

Enclosure

cc: William Hearn, PRD, NMFS, Santa Rosa
ARN#151422SWR2000SR150

Willow Creek 2nd Bridge Fish Passage Project Sonoma County Water Agency Scope of Work

Overview

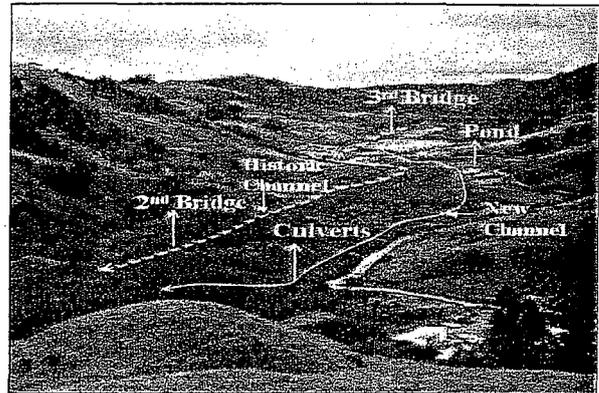
Sonoma County Water Agency (SCWA) funding will contribute to the removal of a complete barrier in Willow Creek, a tributary to the Russian River in Sonoma County, California. The project will restore passage to 7.3 and 4.7 miles of historic steelhead and coho spawning and rearing habitat, respectively, for all life stages by replacing 6 culverts and a bermed roadway with a 43-foot, single-span bridge. SCWA funding will be used to cover the cost of pile installation (\$74,364) and rough grading and culvert removal (\$25,636).

Background

The Willow Creek watershed is essentially a wilderness system, with 90% of the land in public preservation ownership and very few pressures on its habitat or water. It is a coastal watershed with mature, second-growth redwood and fir forests, and the streams are unconstrained by human infrastructure except at the project location. Willow Creek Road is owned by the County of Sonoma and is managed by the Department of Transportation and Public Works. All of the land in the immediate vicinity is owned and managed by State Parks as part of the 10,286-acre Sonoma Coast State Park.

Since the 1980s, salmonid population numbers have dropped dramatically and coho have disappeared altogether. The single greatest limiting factor to salmonid success in the Willow Creek watershed is the migration barrier at the second bridge area road crossing. The lower Willow Creek valley is in an accelerated valley-filling phase due to natural geologic conditions exacerbated by historic logging and land-use practices. The appropriate channel form in these situations is a highly dynamic, multi-thread channel system. Beginning no later than the 1940s, the channel was actively managed to maintain a single-thread channel along the northeast edge of the valley. The stream was moved and straightened, a bridge was installed, and the channel was dredged on a regular basis.

After the property was purchased by State Parks in the late 1970s, dredging was discontinued in 1987 due to ecological concerns. Willow Creek immediately began to aggrade in the vicinity of the 2nd bridge, culminating in complete filling and abandonment of the historic channel on the east side of the valley. Streamflow is now concentrated on the west side of the valley where elevations are lowest.



The bermed roadway across the valley floor and floodplain on the west end of the second bridge crossing acts as a low-head dam, slowing streamflow and restricting fish passage upstream and downstream during spring and winter base-flow conditions. Multiple culverts are located within this bermed roadway, and were originally installed for overflow drainage. These culverts are

damaged, frequently fully submerged, and often blocked with debris during annual high flows. The culverts were not designed for fish passage. Streamflow slows and spreads across the floodplain, overtopping the roadway during most high flows. This condition does not provide a clear path for upstream salmonid migration. With a lack of channel continuity in this reach, upstream migration by adults and downstream migration by juveniles is severely restricted for steelhead and is a complete barrier for coho.

Assessment of the physical limitations and design of a solution to fish barrier issues in lower Willow Creek has been underway since the late 1980s. A multi-agency/organization Technical Advisory Committee (TAC) was formed in 2001 and has evaluated all of the data, constraints, and options for restoring channel processes and fish passage. In 2001, Stewards of the Coast and Redwoods formed the TAC to provide independent scientific and technical advice. This effort resulted in publication of two planning documents for fish passage and habitat improvement: *Sustainable Channel Development in Lower Willow Creek, Sonoma County, California* (PCI 2005a) and the *Willow Creek Watershed Management Plan* (PCI 2005b). Subsequent meetings of the TAC led to selection of the preferred alternative for the crossing. The TAC recommended a stream-crossing structure design that will accommodate channel-forming flows, pass sediment and debris, and be viable for 20-50 years.

Project Description

A preferred alternative to restore fish passage at the 2nd Bridge road crossing has been chosen and designed by Prunuske Chatham, Inc. (PCI) for Stewards of the Coast and Redwoods with funding from the California State Coastal Conservancy (SCC), Sonoma County Fish and Wildlife Commission, and State Parks. Based on the evaluation of the crossing structure types, a precast, single-span bridge was chosen as the preferred alternative. Construction costs for precast concrete bridges are similar to concrete arched culverts; however, a bridge is preferred over an arched open-bottom culvert because of its greater channel capacity for a given base width. Further, it does not require additional fill (up to 2 feet) on top of the structure for the road base.

The project is ready for construction; 80% site designs are complete, a Mitigated Negative Declaration (CEQA) has been prepared, and a geotechnical evaluation of the site has been performed. Preliminary structural bridge engineering and 90% site plans are funded for finalization in December 2009. Funding for preparation of environmental permits is secured, and all permits will be in place by spring 2010.

The following licensed engineers performed the services described above:

- Jonathon Mann, #C63782, Prunuske Chatham, Inc.
- Eric G. Chase, #GE2628, RGH Consultants, Inc.
- Jeff Morris, RCE#46005, Morris Engineering
- Matt O'Connor, #CEG2449, O'Connor Environmental, Inc.

Due to the unique geomorphic channel setting and existing culvert installation/function (i.e., very low gradient, submerged culverts, backwater conditions across the upstream floodplain), the standard practices for evaluating fish passage criteria for culvert retrofits do not apply at this location. A FishXing analysis was performed; however, the results were inconclusive.

Professional opinions (Bill Cox and Derek Acomb, CDFG; Jon Mann, PCI) during the course of this 8-year planning project are that adults are highly unlikely to swim through the culverts (due to submergence, obstructions, high entrance velocities) and that lack of attraction flows across the backwatered floodplain precludes their use by out-migrating juveniles.

The proposed project will replace six channel-constricting culverts with a single-span, precast concrete bridge. Bridge design details include:

- Clear-span length of 43' with a 23' wide deck at elevation of 20' NGVD,
- 2.5' wide by 5' long by 10' tall bridge abutments supported by 16" diameter pipe piles driven approximately 70' deep,
- Bridge approaches graded to meet existing bridge elevation on the western approach and the 18' road contour on the eastern approach, and
- Bridge guardrails and 6" concrete curb designed to meet Caltrans safe design specifications.

A roughly graded channel will be put in under the bridge with a thalweg at an elevation of 12.6 feet. The up- and downstream ends of the new channel will be graded to conform to the existing low-flow channel. The channel will be unreinforced to allow stream processes to reshape it. To reduce flooding frequency, $\pm 790'$ of the existing roadway will be raised and repaved. Grading the bridge approaches will include fill at the edges of the roadway to raise the elevation $\pm 3'$. Grading will result in $\pm 2,100$ cy of cut and 2,500 cy of fill with a net fill of ± 400 cy. Minor fill of wetlands will occur and impacts will be mitigated at a 4:1 ratio. Precise location of mitigation will be confirmed during consultation with the Corps as part of the CWA §404 permit.

Morris Engineering will have prepared 90% structural bridge designs with funding from the SCC by December 2009. Prior to construction, Jeff Morris will prepare the final specifications in consultation with the geotechnical engineer (RGH) and the site plan engineer that prepared the 80% design (PCI). Specific construction tasks will include preparation of a Stormwater Pollution Prevention Plan (SWPPP); mobilization; pile installation; rough grading and culvert removal; installation of the bridge, abutments, guardrails, and drain system; road reconstruction; erosion control and site stabilization; and clean up. Implementation management and oversight will involve documentation of final construction design coordination with subcontractors and the geotechnical and bridge engineers; and preparation of geotechnical monitoring reports, as-built plans, and a final construction report. Jeff Morris and Eric Chase will perform construction monitoring to ensure compliance with the project plans and specifications.

Scope of Work

\$100,000 of SCWA funding will be used to fund pile installation and rough grading and culvert removal.

- **Pile installation:** Procure materials, stake locations, drive piles through existing road bed, cut piles to existing roadbed surface. Cost: \$74,364
- **Rough grading and culvert removal:** Remove and off-haul asphalt, remove existing culverts, over excavate and compact bottom of cut for approach roads; install engineered fill to approach road subgrade, install culvert, rough grade channel, establish abutment bypass lane for construction vehicles. Cost: \$25,636