



## **SCOPE OF WORK**

### **Deer Creek Erosion and Sediment Control Project**

#### **Phase I: Preproject Activities**

Submitted to the Anadromous Fish Restoration Program (AFRP)  
of the  
US Fish and Wildlife Service (USFWS)  
by the  
CSU, Chico Research Foundation  
on behalf of  
The Deer Creek Watershed Conservancy

#### ***1. Scope of the project***

Deer Creek is one of the few remaining streams which supports native strains of the Central Valley spring-run chinook salmon, a species federally proposed as endangered. Deer Creek has been identified as having one of the highest potentials for spring-run chinook salmon restoration within the Sacramento Valley.

The projects identified in this SOW are located in the upper watershed some 30-stream miles from the Sacramento River.

With the leadership of the Deer Creek Watershed Conservancy (DCWC) this project will insure broad community level support for restoration activities. The projects involve private landowners and the DCWC is critical in moving the projects toward implementation.

The work proposed here is Phase I – a planning and review process for the projects listed and described later in this document. A technical advisory team has been assembled, which will be supported by a Project Planner, as needed and as budget allows.

Additionally, the work of the DCWC will provide demonstration value to the projects. This planning project will provide a framework for meadow and roadway restoration projects. The DCWC has been active in pursuing restoration projects that are also identified in the Deer Creek Management Strategy. Diane Gaumer, Executive Director, has established a technical advisory committee to plan and review the implementation of the restoration projects. The technical advisory team consists of the following members:



Diane Gaumer, Executive Director, Deer Creek Watershed Conservancy  
Donald Holtgrieve, Professor, CSU, Chico  
Ken Roby, Biologist, Lassen National Forest  
Greg Nappier, Engineer, Lassen National Forest  
Sue Knox, Project Manager, Vina RCD  
Dennis Heiman, Regional Water Quality Control Board  
Randy Benthin, Dept. of Fish and Game  
Fraiser Sime, Department of Water Resources  
Collins Pine Co. representatives  
Lonnie Johnson, Leasee  
Jim Wilcox, Restoration Specialist, Plumas Corp.  
Matt Kondolf, Fluvial Geomorphologist  
Tom Griggs, Ph.D., Restoration Specialist and CSU, Chico Adjunct Professor

The technical advisory committee is responsible for providing expert advice and direction to the Project Planner, reviewing the restoration plans and drawings for prioritizing the projects, reviewing bid packages, and recommending which packages will go out to bid, and which will be subject to sole source document preparation.

Except for Professor Holtgrieve, Professor Griggs, and Dianne Gaumer, the technical advisors on this project are paid for their time through separate funding.

Associated with the Technical Advisory committee, are Mike Kossow, a restoration specialist with Meadowbrook Conservation Associates, and Bill Howe a former Forest Manager for Collins Pine Co. Kossow will act as the Project Planner under a subcontract to the CSU, Chico Research Foundation. Howe will subcontract to Meadowbrook Conservation Associates. Meadowbrook will be responsible for engineering reports (if necessary) developing the restoration work plans, preparing the design drawings, estimating costs for each project, and preparing the bid packages for each proposed project listed below.

Meadowbrook Conservation Associates has been selected to provide planning support to this project due to their past experience doing restoration work in this area, the expertise of its principles, and the acceptance of Meadowbrook by landowners and agency personnel is critical to acceptance of the work plans. We want to work with willing landowners and agencies, and Meadowbrook's reputation will assist immensely in gaining this acceptance for the proposed work. See Attachment A for more information regarding Meadowbrook's background in restoration projects in the Deer Creek Watershed.

This proposed scope of work is the first step in the implementation of several projects



aimed to restore the aquatic and riparian habitat crucial to anadromous fish in Deer Creek. The project will provide the preparation for specific on the ground projects. The Phase I tasks proposed include: preliminary engineering reports (if needed), technical drawings and restoration plans, outreach/newsletter, and environmental documentation. Time will also be set aside for bid package development. Students will be employed to work on these projects when ever feasible in both Phase I and Phase II.

The tentative proposed on the ground projects to be implemented in Phase II will be prioritized for implementation in this project. It should be noted here that, through separate state funding, the Vina RCD is restoring a site on the North Fork of Deer Creek on US Forest Service property. CSU, Chico is a subcontractor on this project. The sites listed below complement the restoration work being done through that state funding. It is also important to note that on one or more of the sites listed below the land ownership is held by Collins Pine, but the grazing rights are held by a private individual. This individual has not indicated his support for upper meadows restoration projects. It is hoped that once successful restoration projects are completed on properties adjacent to his, he will be more open to restoration occurring on the lands to which he holds grazing rights.

The following is a brief summary of the proposed projects to be scoped and prioritized in Phase I.

#### *South Fork Deer Creek Project*

Located in the southeast corner of Tehama County, the South Fork Deer Creek project encompasses approximately 160 acres adjacent to the State Hwy 32 and State Hwy 36 intersection. This land, owned by Collins Pine, includes high mountain meadow and active stream channel above the confluence of Gurnsey Creek. A forest mix of lodgepole pine, Ponderosa pine, and incense cedar surrounds the meadow. Drainage flows from the surrounding forestland into the meadow and into the creek, which in turn flows into Deer Creek canyon. This project protects water quality and fish habitat in the upper meadows. Down cutting on the stream exhibits such typical characteristics as drying meadow adjacent to the stream, loss of bank protecting vegetation (especially sedge grasses), high vertical and sloughing channel banks, and a widening shallow stream course. Project activities include fencing the main channel, revegetating stream banks, and restoring a demonstration site by sloping back and revegetating the bank.

#### *1575 Road Project*

This project site is located in the south east corner of Tehama County 1 mile from



the intersection of State Hwy 32 and State Hwy 36, or immediately west of State Hwy 36. A gravel road leads to the alluvial bench and head cut that is proposed for restoration. Flows in this creek are seasonally variable and specifically flow through a narrow streambed adjacent to a 30-foot cliff on the west side. Site is managed by the USFS. The 1575 spur terminates onto an alluvial bench adjacent to Gurnsey Creek. The alluvial flat is composed of rhyolite soil and is highly erosive. Water, trapped by the roadbed, has concentrated its energy into a head cut from the end of the road out into the riparian zone of Gurnsey Creek. This is a major point sediment source documented in the 1996 Meadowbrook Road Survey and is recommended for repair because of the volume of material already transported. The project will remove lateral draining water from the road prism, fill the existing head cut, and armor repaired head cut. The project will reduce bedload sediment entering Gurnsey Creek.

#### *1500 Road Repair Project*

Past high flows in a major tributary to Gurnsey Creek have washed out the drainage structure on the main 1500 Road three times in the last 25 years. Each time a larger culvert structure was placed in the stream. The January 1997 flood event exceeded the current drainage structure and requires repair again. The project would replace existing washout with concrete paved low water crossing.

#### *Thirty Top Sediment Sites*

The top 30 sediment sites are located in the south east corner of Tehama County in the headwaters of Deer Creek, on both private and public lands. Private ownership is primarily by Collins Pine and, to a lesser extent, Sierra Pacific Industries. Public lands are managed by the USFS. The majority of these sites are on unpaved logging roads. In 1996, Meadowbrook Conservation Associates surveyed the major forest roads in upper Deer Creek for point source sediment and prioritized the sites by their potential sediment production. Specifics on what corrections were needed to correct each site were not documented by that survey. This project revisits each of the thirty top sediment sites and develops road maintenance specifications and cost estimates for each site. The emphasis in documenting recommended work on construction plans and profiles will be to convey sufficient information to allow crews to complete needed reconstruction without consuming funds in drafting costs.



### *Willis Road Rocking Project*

Fire Mountain Lodge, located along State Route 36 between Childs Meadow and Deer Creek Meadow, generates its own electricity. The access road for the penstock to the Fire Mountain Lodge hydroelectric generator is a significant sediment source to Gurnsey Creek. The road and its maintenance are served by permit from the Federal Energy Regulatory Commission (FERC). This steep road leads to the pond at the upper end of the penstock and traps surface runoff that badly erodes the road. The proposed project would reshape the road prism for improved drainage and surface the road with angular crushed rock. This project would greatly reduce or forestall that next major sediment input into Gurnsey Creek.

### *Gurnsey Creek (North Fork of Deer Creek) Project*

This project area of approximately 100 acres in the southeast corner of Tehama County is comprised of high mountain meadow north of State Hwy 32 and west of State Hwy 36, near the intersection of the two highways. It is bordered to the west and north by coniferous forest from which springs drain into Gurnsey Creek, which is also known as the North Fork of Deer Creek. The alluvial reach of lower Gurnsey Creek is dominated by bare vertical cut-banks, extensive unvegetated gravel bars, a high width/depth ratio, very little in-stream habitat complexity and a lack of stream shades. This project proposes to:

- 1) accelerate the recovery process through extensive vegetation planting,
- 2) demonstrate the use of two bank stabilization methods,
- 3) complete a vegetation survey,
- 4) reduce meadow degradation by blocking roads to stop vehicle traffic on the meadow and in the stream,
- 5) construct in-stream habitat structures made of large wood and boulders that will create in-stream complexity for the existing fisheries and stabilize eroding streambanks. The project will improve water quality through the reduction of fine sediment, and increase habitat complexity.

### *Abandoned State Route 36 Bridge Removal Project*

Removal of tall asphalt paved wooden bridge built by the State of California on Highway 36, approximately 15 miles west of Chester. The footing support for the bridge was sufficiently damaged in December 1964 to require replacement and was abandoned by the State in a realignment of Highway 36. The state quit claimed the rights-of-way and the bridge is located in lands of the Collins Pine Company whose land ownership predates the original construction of the highway. This trestle style wood design bridge has many frequent support legs that sit on pillar concrete footings. With numerous vertical legs in the channel,



log debris transported by high water in Gurnsey Creek lodges against them forming a debris dam. Removal of the bridge is desired before its footing fail during a flood event and the bridge collapses forming an obstruction that the creek would erode around. Removal of the bridge would prevent several hundred cubic yards from entering Gurnsey Creek.

## ***2. Justification for the project***

Deer Creek is an important resource that supports several priority species and habitats. Within the Central Valley, spring-run chinook salmon, fall-run chinook salmon, late-fall-run chinook salmon, and steelhead trout and their associated aquatic and shaded riverine aquatic habitats have been in decline for many years. Deer Creek contains 25+ miles of critical spawning and holding habitat for all four of these species, which have been listed or petitioned for listing under both the California and Federal Endangered Species Acts. The key to sustaining and restoring healthy populations of these fish is protecting and restoring the habitats upon which they depend.

This project will help to expedite the implementation of restoration activities in the Deer Creek Watershed. The projects to be identified and prioritized range from roadway improvements to reduce road-related erosion to bank stabilization and restoration activities.

The project would contribute to and complement implementation of the supporting measures mandated by CVPIA section 3406(e)(1) *restore riparian forests* and section 3406(e)(6) *other measures to protect, restore, and enhance natural production of salmon and steelhead in tributary streams of the Sacramento and San Joaquin rivers*. The project proposal also supports several actions for Deer Creek found in the USFWS *Revised Draft Restoration Plan for the Anadromous Fish Restoration Program (AFRP)*. It explicitly supports *AFRP* Actions 2-3 which call for following recommendations from the local watershed plan to preserve the chinook salmon and steelhead habitat in Deer Creek through cooperative watershed management, and improving spawning habitats in lower Deer Creek for fall- and late-fall-run chinook salmon. Grassroots involvement by the Deer Creek Watershed Conservancy and willing landowners Collins Pine, and USFS provides the local collaboration to ensure the long-term success of this project. These entities are dedicated to utilizing new information and applying it to adaptive management strategies for better preserving Deer Creek's resources.



The following strategies from the *Deer Creek Watershed Management Plan* support this project.

**Goal #5:** Protect and enhance the long-term productivity of the Deer Creek aquatic ecosystem with special consideration for spring-run chinook salmon, fall-run chinook salmon, and steelhead populations and quality of their habitat.

**Goal #6:** Manage watershed lands so as to minimize unnatural rates of erosion and sedimentation.

**Goal #7:** Encourage good land stewardship practices through education, research, and public outreach

From 2. Strategy: Maintain the High Water Quality of Deer Creek

Recommendation 2.C: Utilizing the 1997 Meadowbrook Road Survey, solicit the participation from Lassen National Forest, Collins Pine Company, and Sierra Pacific Industries to aggressively treat known sediment sources. Solutions may include road closures, road repairs, watershed restoration, revegetation, etc.

From 4. Strategy: Protect and Enhance Aquatic Habitat and Streambank Vegetation:

From 5. Strategy: Manage rangeland for multiple resource protection and enhancement, including forage for livestock, wildlife and propagation of oak woodlands.

Recommendation 5.B.: Promote site specific restoration projects in cooperation with Lassen National Forest, Collins Pine Company, and other private landowners in the upper Deer Creek Watershed.

5.B.1.: Where appropriate, fence and plant native riparian vegetation along stream channels and add dead woody material, if determined to be advantageous.

Several planning programs have been prepared that address protection, enhancement, and restoration of aquatic and riparian habitat. These programs include the Upper Sacramento River Fisheries and Riparian Habitat Management Plan (California Resources Agency 1989), Restoring Central Valley Streams: A Plan for Action (CDFG 1993), the Revised Draft Restoration Plan for the Anadromous Fish Restoration Program (AFRP) (USFWS 1997), and the CALFED Bay-Delta Ecosystem Restoration Program Plan (CALFED 1997a), among others.

Specifically these proposed on the ground projects identified will:



Demonstrate that fencing can provide dramatic restoration results, while not restricting ranching activities.

Reduce bedload sediment entering Gurnsey Creek.

Eliminate road fill erosion at creek crossing on Gurnsey Creek.

A critical factor in the health of watersheds is the degree of unnatural sediment contributed to the system. Road related activities are usually the greatest source of unnatural sediment contribution in a watershed. Fine sediment moving through the system leaves a blanket over the clean, loose gravel that Chinook salmon require for successful reproduction. Substrate composition is a critical factor in spawning.

In 1996 Meadowbrook Conservation Associates conducted the *Survey of Road-related Sediment Sources in the Deer Creek and Mill Creek Watersheds*. It was determined in the survey that the majority of sources were in a fairly concentrated area. Additionally, half of the estimated erosion occurred on 5% of the road miles! The road improvement projects listed in this proposal will have significant value in reducing the overall sediment in the watershed by addressing the key sources listed in the report.

The following anadromous fish are expected to benefit from this project: fall-run chinook salmon, late-fall-run chinook salmon, Spring-run chinook salmon, and Steelhead Trout.

In addition to road related improvements this proposal identifies other activities that benefit natural channel and riparian habitat values. The *South Fork Deer Creek Project* proposes to restore meadow and active stream channel by revegetating stream banks, and fencing the main channel. Enhancement of riparian vegetation should benefit fisheries and water quality with reduced sedimentation of streams, and increased shaded riverine aquatic (SRA) habitat that would provide temperature reducing shade, nutrient cycling, input of invertebrates used for food, and woody debris used for instream cover. Enhanced streamside vegetation would also buffer impacts from adjacent uplands.

### ***3. Monitoring and Data Analysis***

Pre-project monitoring of each site will include documentation of baseline conditions, including photos, cross sections of the stream, data collection and analysis. Wherever possible, this work will be performed by CSU, Chico students. Another important aspect of pre-project monitoring is a set of aerial photos.



#### ***4. Work to be performed and deliverables***

Task 1. NEPA and CEQA documentation for seven projects.

Upon project selection and description environmental documentation will be prepared for NEPA, CEQA, and permitting compliance. Depending on the specifics of projects, the legal compliance will range from categorical exemptions to negative declarations with standard mitigation. Outstanding graduate and undergraduate students from CSU, Chico's Department of Geography and Planning's Environmental Planning and Environmental Law classes will be identified and invited to take part in the CEQA, NEPA, and permitting compliance process.

**Deliverables: Copies of NEPA, CEQA, and permitting documents      July 2000**

Task 2. Engineering reports (if necessary); restoration plans/drawings.

After project selection preliminary engineering will begin if necessary. Restoration plans and drawings will be prepared. A technical work plan and a line item proposed budget would be prepared for each project. Mike Kossow, of Meadowbrook Associates, will be the Project Planner for this task. Meadowbrook Associates conducted the initial sediment survey in the upper Deer Creek Watershed. He will prepare the plans and design drawings, and prepare the bid packages for each restoration site. As stated earlier, Mr. Kossow was selected for this program due in part to his many years of experience in this type of restoration work in the upper Deer Creek Watershed. He and his partners in Meadowbrook Conservation Associates are both well known and trusted by the public and private landowners in this watershed, an important component of receiving their approval to perform restoration work on their properties. Please *Attachment A* for Meadowbrook. The technical work plans and the technical team will recommend whether each project is sent out for bid or awarded to a sole source bidder for completion. Graduate and undergraduate students from CSU, Chico's Department of Civil Engineering will be identified and invited to take part in the development of the bid package process.

**Deliverables: Technical Work Plans and Budgets      August 2000**



**Task 3. DCWC Outreach**

DCWC outreach will help to identify the priority projects to be implemented. The DCWC director will coordinate and oversee the Technical Team, and meet with agency representatives. DCWC will distribute a public newsletter describing the projects with on-site photos. (Are they producing the Newsletter, or has it already been produced? It will be produced as a part of this project)

**Deliverables: Prioritized list of Projects**

**August 2000**

**Task 4. Administration**

The administration task includes project reporting, working with the fiscal administrator and the day to day operations this project requires.

**Deliverables: Quarterly reports  
 Final report**

**as required by contract  
 as required by contract**

**5. Budget**

Project Phase and Task	Direct Labor Hours	Direct Salary and Benefits	Overhead Labor (General, Admin. and Fee)	Service Contracts	Material and Acquisition Contracts	Miscellaneous and Other Direct Costs	Total Cost
Phase 1 Task 1	500 hours	17,894.60	5,935.65	0	0	1,150	24,980.25
Phase 1 Task 2	350 hours	5,320.00	1,995.00	29,000	0	700	37,015
Phase 1 Task 3	250 hours	6,600	2,100	0	0	3,410	12,110
Phase 1 Task 4	385 hours	10,317.65	3,276.53	0	0	1,440	15,034.18
Totals		40,132.25	13,307.18	29,000	0	6,700	89,139.43

\*Budget figures and categorical distribution are rough estimates and subject to change.

**6. Quarterly Budget**

Task	April – June	July – September	October – December	January – March
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	2000	2000	2000	2001
Phase 1 Task 1	6,245.06	6,245.06	6,245.06	6,245.07
Phase 1 Task 2	9,253.75	9,253.75	9,253.75	9,253.75
Phase 1 Task 3	3,027.50	3,027.50	3,027.50	3,027.50
Phase 1 Task 4	3,758.54	3,758.54	3,758.54	3,758.56
Totals	22,284.85	22,284.85	22,284.85	22,284.88