



United States  
Department of  
Agriculture

Forest  
Service

Doublehead  
Ranger District

P.O. Box 369  
Tulelake, CA 96134

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Monica Maghini  
United States Fish and Wildlife Service  
Klamath River FWO  
P.O. Box 1006  
Yreka, California 96097-1006

Dear Monica,

The following is the final report for the Phase IV 319(h) Grant, interagency Agreement 14-48-001-96915, granted to the Doublehead Ranger District, Modoc National Forest:

#### Abstract

In July of 1996, the United States Forest Service, Modoc National Forest, and the United States Fish and Wildlife Service, Yreka Fish and Wildlife Office, entered into an interagency agreement to impliment and administer watershed improvement and restoration within the Lost River/Clear Lake watershed of northern California. The bulk of the funding for this project was provided by a 319(h) grant awarded through the North Coast Water Quality Control Board of the State of California.

The program agreement recognizes that livestock grazing is the major resource use impacting watershed conditions and that proper grazing practices are key watershed maintenance, improvement and restoration. Therefore, a project designed to facilitate proper use of key streamside habitats by livestock was implimented through the grant program.

Specific project provisions included construction of riparian fencing to control timing, intensity and duration of cattle grazing, and constructing an offstream water source to enhance livestock distribution and replace watering opportunities lost through seasonal exclusions of cattle access to the target stream.

The project also involves collection of initial monitoring data to evaluate the effectiveness and speed of watershed restoration.

Project construction and initial monitoring data collection was completed in the fall of 1997.



## Introduction

The program for watershed restoration represented by this phase of the 319(h) grant is one of several phases undertaken on the Doublehead Ranger District to complete treatment of the Lost River/Clear Lake watershed.

The Lost River/Clear Lake watershed is one of several headwater watersheds to the Klamath River system. Water from the Clear Lake watershed originates on the Modoc Plateau and runoff drains into Clear Lake, a large irrigation reservoir. Primary streams feeding Clear Lake are North Fork Willow Creek and Boles Creek.

Clear Lake is home of a relatively large and healthy population of Lost River and shortnose suckers, both federally listed as protected under the Endangered Species Act. These fish spawn in North Fork Willow and Boles Creeks.

The Lost River watershed is generally below Clear Lake, however, portions of the watershed drain into Clear Lake. Primarily, runoff from the Lost River watershed drains into Lost River. Lost River also supports populations of Lost River and shortnose suckers.

Water from Clear Lake and Lost River flows , via Lost River, from northeastern California into Oregon where it is used several times for agricultural irrigation, and then back to California into Tulelake. Excess water from Tulelake, a natural basin, is pumped through a series of tunnels and canals, and eventually enters the Klamath River near Klamath Falls, Oregon.

A program of implimenting changes in livestock grazing on Modoc National Forest managed lands, emphasizing maintenance and enhancement of riparian areas was initiated approximately 15 years ago. Projects accomplished under the Interagency Agreement are an integral part of continuing and accelerating this program.

## Description of Study Area.

The study area is within the Modoc National Forest, Doublehead Ranger District. Projects accomplished under this agreement are within the Modoc Plateau, Devil's Garden subsection. This subsection is found primarily between Tulelake and Gooselake in the northern portion of Modoc County, California. Climate is temperate and semi-arid to subhumid.

The geology of the area is characterized basalt and a lesser amount of andesite and pyroclastic rocks. There are some alluvial and lacustrine deposits in small depressions.

The main landform is gently to moderately sloping plateau with few moderately steep to steep hills and scarps. The plateau lacks a well integrated drainage system. there are few stream channels and many small closed depressions, although much of the drainage from this portion of the subsection is into the Klamath River system.

The elevation range of the project area is approximately 4600 to 4800 feet.

Soils of the subregion are mostly well drained on the uplands and well to poorly drained on basin floors.

The predominant vegetation communities are big sagebrush and western juniper. Low sagebrush is common on shallow soils with curlleaf mountain mahogany common on rock slopes and ridges.

Mean annual precipitation is about 10 to 20 inches. Much of the precipitation is snow. Mean annual temperature is about 45 degrees F to 50 degrees F. The mean freeze-free period is in the range from 75 to 125 days.

Runoff from uplands is rapid. Water drains down through joints in the basalt to the ground water reservoir, limiting overland flow of water and development of stream channels. Much of the surface drainage is internal, to closed depressions and water ponds. There are few streams, with most being dry during summer. Streams that flow from the project area enter Clear Lake or Lost River which ultimately release water to the Lower Klamath Lake basin.

Boles Creek, which is the focus of this study, originates from Boles Meadow, ultimately joining North Fork Willow Creek which is the main tributary to Clear Lake Reservoir.

Boles Creek is subject to very high flows during the spring runoff period, which usually occurs in February or March. Late spring and summer flows are controlled by a head gate in the dam at Boles Meadow. Water is typically allowed to free flow out of Boles Meadow until early summer when the head gate is closed. Water input to Boles Creek from that time until fall or winter precipitation add water if only from a few small springs. Typically the creek ceases to flow from early summer until late fall with only the deep pools along the stream channel retaining water throughout the summer months.

Boles Creek has typically been the focal point of livestock and wildhorse concentrations during late summer and fall because the deep pools that retain water are one of the few sources of drinking water for these animals at that time. The result has been repeated heavy grazing since livestock and horses began using the area in the late 1800s. Riparian communities are generally in early seral condition with few if any riparian shrubs present. Streambanks are generally stable, however, because of the large amount of rock that lines the stream corridor. The exception being in stretches of deep soil where banks have been eroded over time and down-cutting has occurred. Current conditions are displayed on the attached Greenline data sheets.

## Methods and Materials

The objective of the project was to gain control over the timing, amount and duration of livestock grazing within key riparian areas in order to achieve improvement in herbaceous and woody plant cover and composition. This improvement in vegetative condition is expected to stabilization of streambanks and improvement in quality of water being produced from Boles Creek.

The methods employed to do this were fencing the riparian corridor into a manageable unit and supplying off stream water sources to attract livestock and wildhorse use away from the stream.

Standard range fence were constructed around the stream corridor and a well was drilled in an upland location to provide drinking water for livestock and wildhorses away from the stream.

Baseline plant community information was gathered to enable documentation of changes to the vegetation as a result of the project. Greenline transects were installed which evaluate plant community seral stage and composition. Photo points were established in conjunction with the Greenline transects.

### Results and Discussion.

A total of 1.5 miles of fence was constructed which enabled Boles Creek to be rested from grazing in the 1997 grazing season. One well was drilled and pumping equipment purchased in the fall of 1997 which was too late in the season to be put into operation for 1997. This well will go into operation beginning in May of 1998.

Greenlines and photo points were installed in Boles Creek as previously discussed. Greenlines indicate a predominance of early seral plant communities. Greenlines will be reevaluated every 3-5 years to determine changes in community seral stage.

### Summary and Conclusions

One year rest from livestock grazing was accomplished from installation of riparian fencing during the 1997 grazing season. Further rest and livestock control will be possible in future years as a result of the project. The effects of well development have not been evaluated because this improvement was not completed until after the end of the grazing season. Evaluation and monitoring will continue as part of range program administration.

### Summary of Expenditures

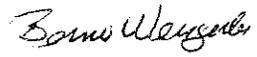
A complete compilation of costs is not available at this time. A complete accounting will accompany the final billing. The following is a listing of items on which expenditures were made under this Interagency Agreement:

1. Purchase fence materials - 1.5 miles
2. Labor to construct 1.5 miles fence.
3. Install one cattleguard.
4. Purchase solar generator and pump for well.

5. Overhead

If you have any questions regarding this final report, please contact Brad Reed at this office.

Sincerely,

A handwritten signature in cursive script, appearing to read "Bernie Weisgerber".

BERNIE WEISGERBER  
District Ranger

cc: SO - Jean Atkins