

Frey Ranch Tailwater Capture Project Final Report

Cooperator: Resource Management
Cooperative Agreement #: 113332J007
Vendor Agreement #: 11333-1331-1HR6
Date of Report: June 10, 2003

Abstract

The Shasta River is a major tributary to the Klamath River and is a significant producer of anadromous salmonids in the Klamath system.

By early summer, salmon and steelhead rearing in the Shasta River struggle to withstand both high water temperatures, and low levels of dissolved oxygen. Numerous measures are being undertaken to improve these conditions, including livestock exclusion fencing of riparian zones, planting of trees, encouraging a narrowing and deepening of the river channel, and removal of flashboard dams. Despite the long-term importance of all these measures, one of the single most effective ways to improve water quality quickly is to eliminate the warm, nutrient-rich tailwater returning to the river from irrigated fields.

Many thousands of acres are irrigated in the Shasta Valley. The standard practice is flood irrigation, which invariably results in the creation of irrigation tailwater, which often returns to the Shasta River. This tailwater tends to bring nutrients with it, which ultimately adds to dissolved oxygen problems in the river. During the day, the tailwater becomes hot, which can contribute to rising river temperatures. The capture and re-use of irrigation tailwater is a "best management practice" that eliminates these adverse effects.

The Frey Ranch is located within the Shasta Water Association, a farmer's cooperative irrigation district. This tailwater capture project is the beginning of several similar projects that will be strategically placed to pinch off the tailwater currently originating from that irrigation district.

In this project, a small pond was constructed, and a pump and sprinkler system installed. Tailwater flows into the pond, accumulates over several days, then is used to irrigate a small part of the Frey property.

Introduction

The goal of this project is to assist in the protection of salmon and steelhead habitat from harmful effects of water projects in the Klamath Basin by eliminating nutrient loading resulting from irrigation tailwater returning to the stream. To help accomplish this goal a tailwater project was initiated and completed on the Frey Ranch in the Shasta Valley.

Study Area

The project site is located on the Frey Ranch, which is approximately four miles east of Yreka, Calif. on Oberlin Road. The Frey Ranch is near the Shasta River, which is a major tributary to the Klamath River

Methods and Materials

The tailwater at this project site originates both from the Frey Ranch irrigation, and also from the irrigation of several landowners further uphill. A small pond approximately 150' x 250' was constructed so as to capture this irrigation water which flows down a draw in the Frey Ranch.



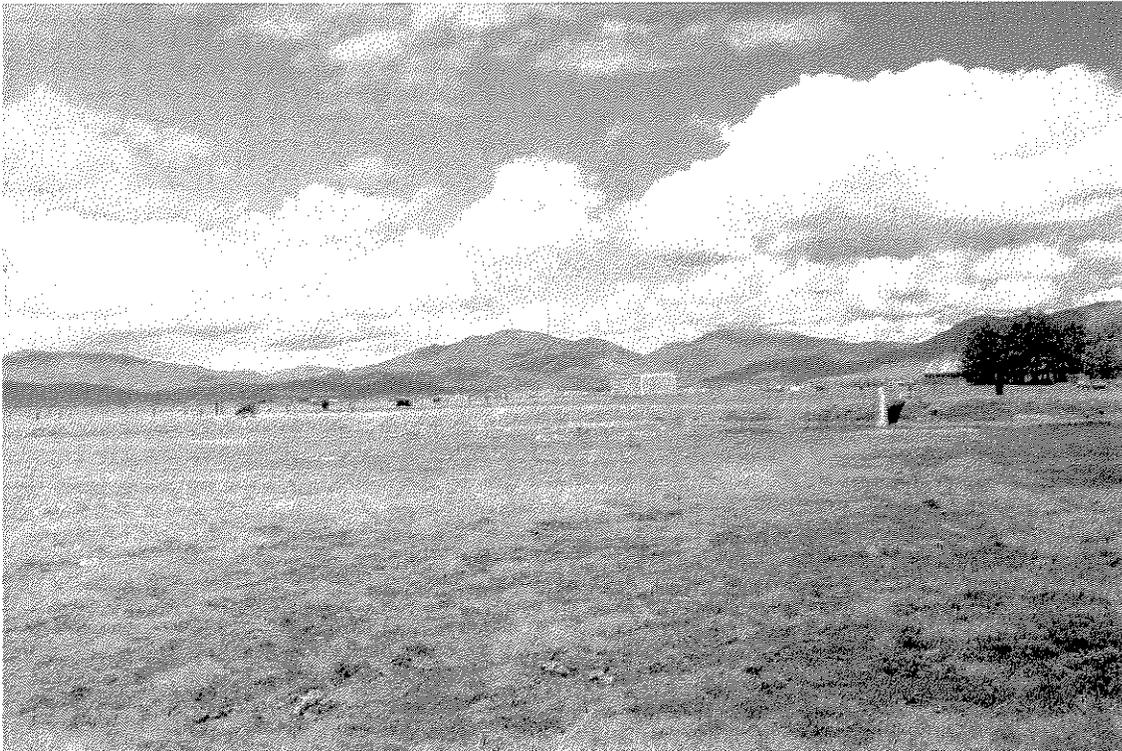
The tailwater, which accumulates in the pond over several days, is used to irrigate a small part of the Frey property. An electrical pump was installed to pump water out of the pond to a sprinkler system. Since sprinklers are used for the re-use irrigation, no additional tailwater will be created.

The pond was constructed using on site materials and excavated with the use of an excavator and dozer. Additionally, a small rearing mound was constructed in the center of the pond to add wildlife habitat.



Results and Discussion

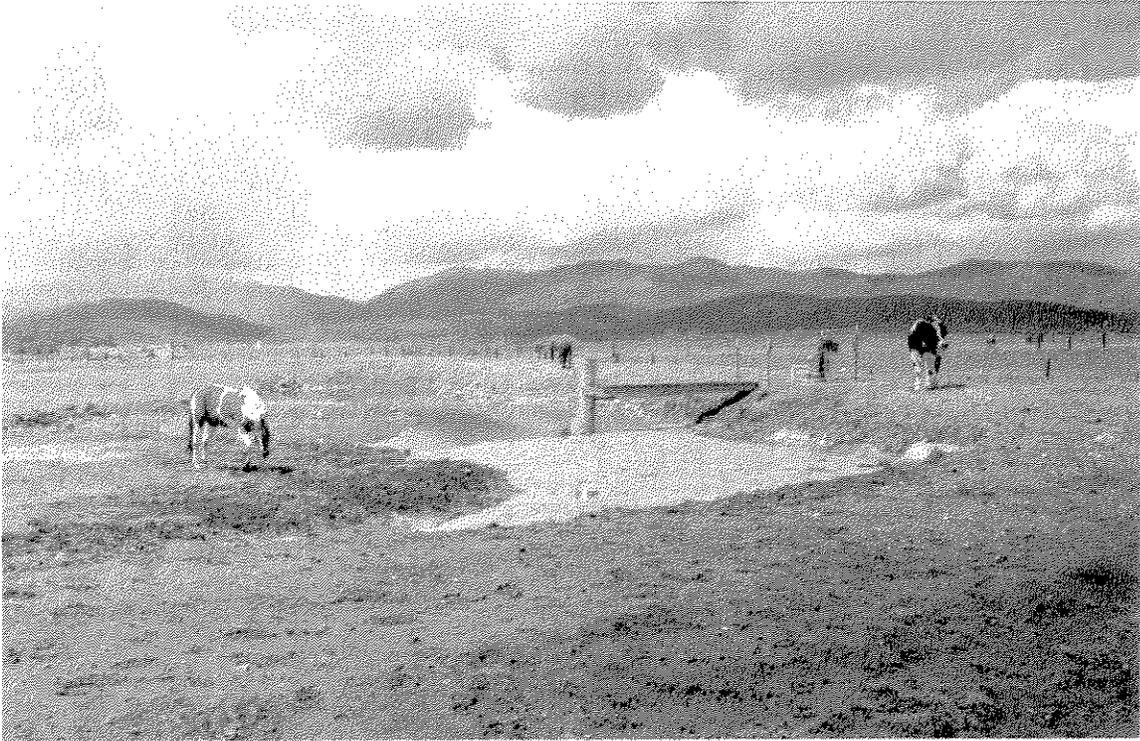
The pond construction was completed according to Natural Resource Conservation Service standards and the electrical equipment was installed to meet Siskiyou County Building Code standards. Electrical power was extended to the new pond and a pump was installed to lift tailwater from the pond and pressurize it for sprinkler irrigation. A pipeline was installed to transport the re-use tailwater to the area to be irrigated.



Summary and Conclusions

The newly constructed pond is capturing tailwater flowing down a draw on the Frey Ranch, which is originating from the Frey Ranch as well as from several landowners further uphill. The pond is sealing well and appears to be holding water in enough volume to allow sufficient re-use irrigation. The wildlife rearing mound constructed in the center of the pond is being utilized by two pair of geese.

Native grass seed was spread over bare areas of the dam. It will take future plantings of native grass, forbs, and woody plants for final bank stabilization and appropriate wildlife habitat. It appears that this project has assisted in the overall goal to promote cooperative relationships between the lawful users of the Basins land and water resources. Additionally, this project has contributed to the protection of salmon and steelhead habitat in the Shasta River from harmful effects of tailwater by eliminating nutrient loading from the irrigation water through capture and re-use.



Attachment 1a

**GRANT AGREEMENT
113332J007
Project (2002-1331-1HR6)
SUMMARY OF EXPENDITURES
FREY RANCH TAILWATER CAPTURE PROJECT**

a. Salaries (including benefits)	\$1,048.00
b. Operating Expenses	7,093.00
c. Administrative Overhead	<u>814.00</u>
TOTAL PROJECT COST TO USFWS	\$8,955.00

In-kind contributions:

Landowner:

100 hrs. of project oversight	
Utilizing and maintaining the system	
Equipment, labor	
Future maintenance and operation cost	\$9,496.00

TOTAL PROJECT COST WITH IN-KIND **\$18,451.00**