



## Section 319

# NONPOINT SOURCE PROGRAM SUCCESS STORY

## Pyramid Lake Paiute Tribe, Nevada

### Improved Grazing and Agricultural Management Reduces Nitrogen in the Truckee River Watershed

#### Waterbody Improved

Uncontrolled cattle grazing and poor agricultural practices resulted in the loss of instream and riparian habitat, degrading the water quality of the Lower Truckee River and Pyramid Lake within the Pyramid Lake Paiute Tribe's reservation. Livestock fencing, laser leveling of agricultural fields, and other agricultural best management practices have succeeded in reducing in-stream nitrogen levels and achieving water quality standards in the Lower Truckee River.

#### Problem

The Pyramid Lake Paiute Tribe's reservation, in northwestern Nevada about 35 miles northeast of Reno, encompasses 474,000 acres. The Lower Truckee River originates in the Sierra Nevada and flows through the reservation for 31 miles, terminating in Pyramid Lake within the reservation. The installation of Derby Dam (on the Lower Truckee River upstream of Pyramid Lake), and the channelization (and removal of streamside vegetation) of the Lower Truckee River in the early to mid-1900s by the U.S. Army Corps of Engineers have historically affected the river, causing increases of total dissolved solids, increases in alkalinity due to the loss of inflow, and a loss of habitat, resulting in the depletion of fish species.

Over the past two decades, uncontrolled cattle grazing and feral horses have further contributed to soil erosion, the loss of native vegetation, and destabilized streambanks. As a result, the Lower Truckee River experienced high turbidity and increased nitrogen levels, affecting the recovery of the endangered cui-ui fish and the threatened Lahontan cutthroat trout.



Spring area before fence enclosure.



Spring area 22 months after enclosure.

Laser leveling of agricultural fields uses water more efficiently, which significantly reduces return flows to the river as shown in the lower photo prior to laser leveling.



## Project Highlights

In 1998 the tribe initiated activities with section 319 funding to address unmanaged cattle grazing on the reservation. With assistance from the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS), the tribe developed and implemented a range management plan covering lands along the Truckee River corridor, which included efforts to install 60 miles of fencing, as well as solar-powered wells and water tanks to serve as alternative water sources to keep livestock out of the river. Laser leveling of agricultural fields—using a laser beam device mounted on a tractor that controls tillage depth—was also implemented to reduce nutrient runoff. Leveling reduces the amount of water required to irrigate fields, allows for a more uniform distribution of

water across the field, reduces the amount of fertilizers and pesticides needed, provides a uniform-moisture environment for crops, and as a result, allows more uniform germination and growth of crops.

The tribe revegetated, restored, and stabilized some sections along riverbanks to reduce sedimentation and nutrient loading into the river. Restoration efforts also included wetland development to reduce the amount of wastewater nutrients from the Numana Fish Hatchery entering the river. Upstream of the river, the City of Reno/Sparks, Nevada, and the City of Truckee, California, installed new denitrification plants to lower nutrient inputs that had been previously discharged from the municipal treatment plant.

## Results

Project activities have resulted in significant reductions in total nitrogen levels from 0.584 mg/L in 2001 to 0.292 mg/L in July 2004, and in  $\text{NO}_2 + \text{NO}_3$  levels from 0.127 mg/L in May 2001 to 0.084 mg/L in 2004. The tribe conducts monthly water quality monitoring at various locations along the lower Truckee River, and results indicate that the project has succeeded in reducing in-stream nitrogen levels and achieving water quality standards in the Lower Truckee River.

## Partners and Funding

This project included support from the NRCS Environmental Quality Incentives Program, The Nature Conservancy, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, and tribal farmers and ranchers. Approximately \$400,000 in section 319 funding has supported the implementation of alternative water sources, as well as the installation of pipes, wells, and tanks on the range and along the Truckee River.



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