

## *Water in our Basin*

# Projects aim to reverse changes in the Klamath River watershed

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It's a natural phenomenon.

Upper Klamath Lake is green-tinged in summer and laden with algae.

But scientists say the lake wasn't always that way. Over the years, changes to the Klamath River watershed altered its makeup, and today, they say, it is rich in phosphorus and nitrogen, and overrun by one species.

### **Algal growth**

The algae feed on the phosphorus and nitrogen, nutrients that promote very dense algal growth, said Matt Berry, assistant field supervisor for habitat restoration for the U.S. Fish and Wildlife Service.

"When that happens, through photosynthesis, it changes the water chemistry in the lake. The algal blooms grow so dense, they all die at once. Then we have a bloom and crash cycle in the lake," Berry said. "When the algae crash, the dead cells consume oxygen and that creates harsh conditions for the fish."

Normally, the algal growth would be naturally inhibited, just like any plant or animal population in an ecosystem. For animals, it can be disease. For the algae, it would be lack of food. However, there is plenty for the algae to eat in Upper Klamath Lake.

### **Nutrient-laden soils**

The nutrients are found in the soils lining the rivers and streams that flow into the lake. They become dislodged when cattle trample the river banks and when riparian vegetation disappears. The plants help hold the soil in place. Fast moving water erodes the riparian zones when the rivers are full from spring runoff.

Landowners above Upper Klamath Lake are rebuilding their sections of riverbank and re-establishing flood plains. They are practicing careful livestock grazing along riparian zones. They are providing offstream water sources.

"It's not one single thing, it's a variety of things, and multiple landowners willing to help improve the conditions on their land," said Rick Craiger of the Oregon Watershed Enhancement Board. "I have never met anyone who wanted to abuse their land. They want to improve it, which benefits the entire watershed."

Through managed riparian grazing, planting of native species, breaching of man-made dikes and fencing, these landowners are hoping to make a difference in the nutrient load carried to the lake, and ultimately released to the Klamath River. These small-scale projects will hopefully restore and protect riparian zones, said Nathan Jackson, interim executive director of the Klamath Watershed Partnership.

"Those riparian areas are so important for filtering run-off from fields, cooling water temperatures in creeks and rivers, the vegetation is good for wildlife, it provides cover for fish, habitat for birds and other species," he said.

### **Impact not known**

The exact impact is not yet known, but state, federal, tribal and nonprofit agencies are conducting research, Craiger said.

“They’re not done yet. We know certain practices are beneficial, but we don’t know the aggregate benefit without additional study,” he said. “From a watershed perspective, we’re not going to run out of projects that we know individually are successful. What we don’t know is collectively what they’ve accomplished.”



AP file photo - Explosives blast earthen dikes into the air Oct. 30, 2007, to allow water back onto 2,500 acres of farmland, starting the restoration of marshes critical to rebuilding populations of endangered Lost River suckers and shortnose suckers in Upper Klamath Lake.

### **High impact projects**

#### **Chiloquin Dam removal**

In October 2008, the Chiloquin Dam, identified as a barrier between the lake and sucker spawning grounds in the Williamson and Sprague rivers, was removed. Used

solely to provide power to irrigators, the dam's removal was expected to increase sucker spawning habitat by as much as 80 miles.

Built in 1914, the dam came down quite easily, a Bureau of Reclamation engineer told the Herald and News. The riverbanks were restored to what is thought to be the original course of the river using photos from 1914.

**Williamson River Delta restoration**

In October 2007, four levees were breached in the Williamson River Delta Preserve, where the Williamson River meets Upper Klamath Lake. Owned by The Nature Conservancy, the 7,500-acre preserve's main purpose is to provide habitat for the sucker. In October 2007, more levees were breached to reconnect the lake with Goose Bay.

Landowners had changed the delta in the 1950s by building levees to create farmland. The Nature Conservancy bought what was then Tulana Farms in 1996 and neighboring Goose Bay in 1999. No more plans to alter the landscape are in the works, and officials say nature will take over from here.

**Defining terms**

**Watershed:** The entire geographical area drained by a river and its tributaries.

**Water quality:** The biological, chemical and physical conditions of a water body. A measure of a water body's ability to support beneficial uses.

**Nutrient load:** The total amount of nitrogen or phosphorus entering the water during a given time.

**Riparian:** Of or relating to or located on the banks of a river or stream.

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