

# Dam removal: Making the decision

## *Team of scientists gathering information for Secretary of the Interior*

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United States Secretary of the Interior Ken Salazar will decide whether removing four hydroelectric dams on the Klamath River is in the best interest of U.S. citizens.

Teams of scientists and others are already working furiously to provide the information the secretary will need to make that decision, possibly as soon as November 2011. The Klamath Hydroelectric Settlement Agreement, if implemented, calls for the secretary to make a decision on dam removal by March 31, 2012.

Dennis Lynch of the U.S. Geological Survey is coordinating efforts to present all relevant information to the secretary. He headed a panel of scientists at the Klamath Basin Science Conference in Medford last week and discussed how they would determine the information — much of it unknown — the secretary will need.

“This is a very large environmental question being asked,” Lynch said. “These agreements as written are non-severable and must be implemented together and in their entirety.”

Dam removal is part of two settlement agreements — the Klamath Basin Restoration Agreement, which allocates water among stakeholders in the Klamath River Basin; and the Klamath Hydroelectric Settlement Agreement, which OKs a study to determine feasibility of removing the Iron Gate, Copco 1, Copco 2 and J.C. Boyle dams.

Lynch said the questions the teams must answer include:

### **Should the dams be removed?**

If they are removed, should restoration be done?

Would implementation of the Klamath Basin Restoration Agreement and the hydroelectric agreement advance fish populations? Is implementation in the public interest?

Can dam removal and site restoration be done inside the cost cap of \$450 million?

What liabilities and risks may the dam removal entity have to deal with?

Not dealt with at the science conference were the economic, tribal and cultural, agricultural, commercial fishery or recreation impacts. Lynch said information about those impacts also would be presented to Salazar, but weren't within the scope of the conference.

Most of the studies being conducted on the effects of dam removal compare dam removal with doing nothing. The studies will look at effects 50 years beyond the 2020 removal date. Environmental Impact Statements and Environmental Impact Reports, which go through public review processes, will also be conducted prior to dam removal, Lynch said.

### **Engineering**

The overall goal is to determine the actual cost of dam removal and restoration activities called for by the two settlements, said Tom Hepler of the Bureau of Reclamation.

Studies will look at the physical activity of removing the dams, reservoir restoration, and modifications of Keno dam to allow for additional fish passage. Hepler said Keno dam's fish ladder does not meet the current standards, but the one on the Link River dam does.

Hepler is currently estimating the amount of material that must be removed to take out the dams entirely, and will compare that cost estimate with removal to the point where fish may pass freely.

His assessment will encompass temporary roads that will be constructed, engineering costs, landfill costs, revegetation and slope stabilization, as well as plans for recreational opportunities.

Hepler said his biggest challenge is the time frame called for in the agreements.

“We must go from power plant to free-flowing river in a 12-month period,” he said. “It will require intensive activity by contractors.”

Hepler said he will present the most probable high and low cost estimates to the secretary.

## **Climate change**

Extensive modeling will be used to find out how water will move through the river without the dams in place, and how climate change is expected to affect river flows, said Nancy Parker of the U. S. Bureau of Reclamation.

Parker's models will be used by others in the determination process to estimate what will happen to sediment and fish after dam removal.

"Our focus is on flows at Keno dam all the way down to the ocean," she said.

Parker will develop 50 different scenarios of what could happen to future flows based on climate change models and current flows from Keno dam. She also will include scenarios that use Agency Lake and Barnes Ranch areas for additional storage.

## **Sediment transport**

Sediment trapped behind the Klamath River dams will be released if the dams are removed. The Bureau of Reclamation is expecting most of the sediment load to be washed downstream in the first year after dam removal, said Blair Greimann.

Greimann's focus will be on modeling how much sediment will be released and how long it will take to flush out of the river.

Greimann also will try to determine impact to users of reservoirs and ground and surface water.

Chauncey Anderson, a hydrologist with the U.S. Geological Survey, said samples of the sediment have been taken behind all four dams to compile a comprehensive list of contaminants present. Although Anderson said the list is extensive, no algal toxins were identified in the 32 samples.

Anderson will attempt to answer whether the sediment will impact the amount of oxygen in the water available to fish.

"At some point, we assume a relatively stable (river) bed," Anderson said.

However, the effect of Upper Klamath Lake in the equation is the "600-pound gorilla," Anderson said.

The hope is that restoration activity impacting the nutrient load into the lake will reduce the amount of nutrients exported down river.

## **Impact on wildlife part of decision**

Biologists have identified fall and spring Chinook and coho salmon, steelhead, lamprey, sturgeon and other river fish, along with some marine species, as having significance in discussion of dam removal, said biologist Jim Simondet.

Other species potentially impacted are the Lost River and shortnose sucker, red band and other trout species, blacktailed deer and spotted owl.

"This is an initial list," Simondet said.

The biologists' task is to determine population viability with and without dam removal. The analysis will include the 10 years between now and the 2020 dam removal deadline.

Simondet said it is estimated there are 420 miles of usable habitat above Iron Gate dam and another 60 miles could be restored. Little data has been collected about the fish populations except for fall and spring Chinook, Simondet said. The rest of the information will be filled in by panels of experts, he said.

Information about the listed suckers will come from those who study them. Bass and perch currently living in the reservoirs are expected to be lost through dam removal, but suckers trapped in the reservoirs will be captured and relocated, he said.

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