“Combat biology” on the Klamath River

It was just too hard to resist this current example of a battle over water rights (Riparian doctrine)

Good Science, Bad Science,

Ugly consequences
"Biologists are caught in a classic western water fight”*

Farming vs. Fishing – who has the right to water in the Klamath Basin?

* Information and citations for this talk were taken from the 4/4/2003 issue of Science
A little history

- **1864**: U.S. government signs treaty with the Klamath Indians guaranteeing them abundant fish stocks in perpetuity.
- **1902**: Congress passes the Reclamation Act to encourage settlement in the west.
  - Resulted in the Klamath Irrigation Project to support creating farms in the Klamath basin.
  - By 2001 the Klamath Project includes 97,000 hectares (1 hectare = 10,000 m² = 2.47 acres) of land under irrigation.
  - Typical yearly water diversion = 62,000 hectare-meters (500,000 acre-feet) of water.
Water diversion vs. fish

- By mid 1980’s phosphorus–rich runoff from farms resulted in **massive algae blooms** in Klamath Lake.
  - Producing wild swings in lake pH and O₂ levels and a stressed fish population.
- By 1988 two fish populations were on the endangered species list (the shortnose and Lost River suckers).
- In 1997 the Klamath River coho salmon was listed as threatened.
Listing of fish as endangered triggered development of a recovery plan under the Endangered Species Act (ESA)

- In 2001 the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) developed biological options (BiOps) for the fish.
  - To protect the suckers: Specified a limit on diversion of water for irrigation (a minimum water level in Klamath Lake)
  - To protect the salmon: Specified a minimum flow of 1000 cfs for Klamath river.
BUT 2001 was a bad year for water!
(< ½ the usual snowpack in the Cascade mountains)

- Fulfilling the BiOps required cessation of water diversion in April 2001.
  - The headgates to the Irrigation project were locked.
  - Farmers revolted; staged demonstrations and even briefly forced open the headgates.

“Some sucker stole my water”
Sooo – the Bureau of Reclamation called in the National Research Council (NRC) [the science arm of the National Academy of Science] to see if the BiOp was “scientifically justified”.

- The NRC agreed with most of the recommendations in the BiOps, BUT did not find a scientific justification for either the minimum lake water level or the minimum stream flow.
  - Fisheries biologists felt undermined:
    “It has been a very painful thing to see everything we have worked for over the past decade [described] as useless.”
  - Farmers were irate:
    “A handful of U.S. Fish and Wildlife Service bureaucrats withheld desperately needed water from farmers . . . Now we find out that that decision was based on sloppy science.”
Sooo – the Bureau of Reclamation and the NMFS met and compromised on a plan that dropped summer flows to as little as \( \frac{1}{2} \) the minimum recommended in the original BiOp.

- As if on cue, 33,000 fish died in the lower Klamath river in Sept. 2002.
  - Reportedly the largest fish kill in North American history.
  - Cause of death thought to be enhanced spread of naturally occurring infections among spawning fish caused by cramped conditions from low water levels.
Ensuing developments

A coalition of fisheries and environmental groups sought a court injunction against the reduced flows.

- “Why should farmers have all the water they need while coastal fishing-dependent communities and fishing families wind up with dead fish and dry rivers?”

Meanwhile, the Bureau of Reclamation defended its decision by saying it used the “best available science” in using the NRC report.

- Strictly speaking the report is correct in noting there is no correlation between low water levels and poor water quality conditions.
  - For example in 1995, 1996, and 1997 lake levels were intermediate to high, but there were fish kills each year.

- But it is also reasonable to expect that, all other factors being equal, higher water levels will dilute phosphorous inputs and lessen the severity of algae blooms.
Ugly bottom line?

- The NRC report has changed the basis for making decisions to protect endangered species.
  - USFWS and NMFS are charged with using the best available science in protecting endangered species.
    - BUT when the science is questionable, they are supposed to **err on the side of species protection**, even when their recommendations haven’t been proven to work.
  - Now the bar has been raised and the agencies need to prove there is a harm done by not acting.
    - “All conservation goes out the window if you have to wait for fish to die to say there is an effect.”
  - Also, remedies that take a long time won’t be implemented because an immediate benefit can’t be shown.
    - For example, almost everyone agrees reduction of phosphorous inputs from farm runoff is needed. But the lake sediments have a large supply of phosphorus and it will take years or decades before an improvement can be seen in response to even a vast reduction.
Update

- In 2010 another severe cut of water for agricultural use occurred as a result of below average inflows & drought. This action caused many adverse economic consequences to the Upper Basin's agricultural communities.

- Dependent upon the Klamath Project in 2011:
  - 1,400 individual farms and ranches – 200,200 acres
  - 44,300 acres of National Wildlife Refuges

- The federal budget request for FY 2012 for the Klamath Project is $18.6 million.
  - This money would be used to improve water supplies and management to benefit both fisheries and agricultural users.