



## Monitoring Native Fish Populations

FY 2009 President's Budget

### ISSUES

Native fish, particularly cutthroat and bull trout, will be harmed by the higher water temperatures and lower stream flows forecast by the end of this century in the West. Not only would these conditions lead directly to fish mortality, but they would facilitate the invasion of nonnative species. Current declines in trout and salmon throughout the Northwest have led to over \$3 billion in spending, mostly on habitat improvement: structure placement, flow enhancement, restored fish passage, and erecting barriers to nonnative fish invasions. Monitoring of these activities, however, has been sporadic, and their effectiveness is uncertain. Ongoing measurement of stream characteristics (Pacfish Infish Biological Opinion (PIBO) monitoring) in the Interior Columbia River Basin (ICRB) is designed to evaluate land management effects, not changes in fish abundance. Thus, the response of fish populations, either to climate change, land management, or habitat improvement, is not based on direct, reliable measurements.

### IMPORTANCE

Maintaining native fish, particularly salmonids, is of great interest to the general public. Bull trout and several species of cutthroat trout are listed under the Endangered Species Act, and their presence is regarded as indicative of stream and ecosystem health. In 2007, Montana closed many rivers and streams to fishing because of high temperatures and low flows, greatly impacting tourism, retail businesses, and river-related recreation.

### FUTURE PLANS

New methods developed at Rocky Mountain Research Station (RMRS) and elsewhere allow inexpensive genetic monitoring of salmonid fish populations across broad geographic regions (See: Wildlife and Fish Genetics briefing).



*Colorado River cutthroat trout occupy 13% of their historical range*

Resulting metrics include measures of population size, connectivity, hybridization, maintenance of genetic diversity, and the presence of non-hybridizing exotic species. We propose expansion of PIBO sampling to include collecting genetic samples from representative streams across the ICRB. PIBO sampling for each stream is repeated every 5 years, allowing detailed time-series analyses of population dynamics, changes in connectivity, and hybridization. PIBO supports the expansion of its efforts to include direct fish monitoring and will run the crews. Some initial genetic research is required to develop additional specific primers for cutthroat trout, but we have the genetic facilities to do this research and, from a scientific standpoint, this monitoring is entirely feasible and cost-effective.

### EXPECTED OUTCOMES

This will allow evaluation of the efficacy of indirect stream measurements as proxies of fish population status, and may allow streamlining of existing PIBO monitoring. Even more importantly, it will allow more effective planning for projects such as the installation of fish-friendly culverts that cost upwards of \$50,000 each, and will provide defensible data on the status of native fish populations to evaluate restoration projects and inform future management and listing decisions under the Endangered Species Act.