

Fossil Creek Restoration and the Childs-Irving Decommissioning Project

2004-2005 Fossil Creek Restoration

Research and monitoring began in the summer of 2004 and continues in 2005 and beyond to determine the effects of the return of full flows on Fossil Creek vegetation, birds, fish, and other aquatic species and processes. Fossil Creek will serve as a case study to inform and guide the removal of hydroelectric facilities and dams elsewhere in the U.S and the world. Research includes:

- Fish, aquatic invertebrates, and crayfish (NAU)
- Travertine formation, nutrient cycling, and decomposition (NAU)
- Native fish restoration and monitoring (multiple partners including Bureau of Reclamation, Arizona Game and Fish Department, U.S. Fish and Wildlife Service, and U.S. Forest Service)
- Spring water chemistry and discharge rates (NAU)
- Travertine changes and effects to fish, algae, aquatic insects, and overall diversity (NAU)
- Recreation impacts to understory vegetation (NAU)
- Monitoring of black hawk, yellow-billed cuckoo, and lowland leopard frog and their habitat (Forest Service, U.S. Fish and Wildlife Service, Arizona Game and Fish Department)

APS Decommissioning Activities 2005

APS took the bold step in 1999, and, in cooperation with several conservation organizations, began the process to decommission the Childs-Irving hydroelectric facilities. In October 2004, the Federal Energy Regulatory Commission approved the license surrender. All decommissioning activities, including the removal of the entire flume, will be completed by the end of 2009. APS activities in 2005 include:

- Return of full flows to Fossil Creek, June 2005
- Temporary bridge construction at Irving
- Removal of Irving diversion and intake structures
- Removal of wood trestle flume upstream of Irving (will take 1½ years to complete)
- Removal of Childs infrastructure (most buildings) and site cleanup

CHILDS POWER PLANT



The Childs Power Plant will be decommissioned and most of the structures will be removed; the power house and ice house remain.

A diverse array of partners have been instrumental in this project including conservation groups such as American Rivers, Center for Biological Diversity, Northern Arizona Audubon, Arizona Riparian Council, and The Nature Conservancy. NAU has received significant funding from the Nina Mason Pulliam Trust.



Surveys for sensitive bird species such as the yellow-billed cuckoo (a candidate for listing under the Endangered Species Act) will take place along Fossil Creek.



Rates of travertine deposition are being studied prior to and after the return of full flows. The connection of travertine to fish, algae, aquatic insects, and overall biological diversity is being studied.



As part of the decommissioning of the Irving Power Plant, APS will remove all structures and the creek vehicle crossing; foundations of buildings will be retained as historical evidence.

IRVING POWER PLANT



FLUME



DIVERSION DAM

Nearly 25,000 cubic yards of sediment have accumulated behind the Fossil Springs Diversion Dam. Much of this sediment will be moved downstream by large storms when APS removes the top 14 feet of the dam in 2007. Researchers will examine the rate of sediment movement and its relationship to other resources in Fossil Creek such as travertine development and the health of aquatic species. This information can then be applied to other dam removal actions across the country.

FOSSIL SPRINGS



Spring discharge rates and water chemistry are being studied to understand and identify trends which might be influenced by climate change or pumping from the regional aquifer.



A native desert sucker in Fossil Creek.

The multi-agency Native Fish Restoration Project, completed in November 2004, removed non-native fish (such as green sunfish and smallmouth bass) between the fish barrier and the diversion dam.



To assess effects of increased recreation in the Fossil Creek area, NAU is monitoring 41 permanent plots along existing riparian campsites such as the one pictured here. This information, along with visitor surveys, will be used by the Forest Service to develop a monitoring plan to manage Fossil Creek in the future.

STEHR LAKE



Stehr Lake, artificially created as a back-up water supply for the Childs Power Plant, will no longer be supplied with water from the flume and will dry up; native vegetation will be planted and the soil will be re-contoured to restore the area to its former condition.

FISH BARRIER



A fish barrier was constructed in 2004 upstream of the Verde River. This small structure is not a dam, but allows the natural flow of water while preventing non-native fish from moving further upstream into Fossil Creek. Non-native fish are a serious threat to native fish in Arizona.

VERDE RIVER

For more information:

www.verde.nau.edu/FossilCreekProject
www.aps.com/aps/CI/Default.html

