



Glen Canyon Dam Adaptive Management Program Fish Community Monitoring

The conservation of native Colorado River fish species—such as the endangered humpback chub (*Gila cypha*)—and the management of the rainbow trout (*Oncorhynchus mykiss*) fishery at Lees Ferry are key elements of the Glen Canyon Dam Adaptive Management Program (GCDAMP). Under the auspices of this program, the U.S. Geological Survey (USGS) coordinates monitoring from Glen Canyon Dam to Pearce Ferry, which is about 295 miles downstream of the dam. Fish monitoring, primarily for humpback chub, is also conducted in the Little Colorado River, a tributary to the Colorado River. The Arizona Game and Fish Department (AGFD) and the U.S. Fish and Wildlife Service (USFWS) work cooperatively with USGS scientists to conduct fish community monitoring activities in these location. Because monitoring occurs in Glen Canyon National Recreation Area and Grand Canyon National Park, GCDAMP monitoring efforts are coordinated with the National Park Service (NPS).



Colorado River Fish Monitoring Trips and Your Visit

To monitor fish populations in the mainstem of the Colorado River, four motor-supported river trips are conducted during the NPS-authorized motor season, May through September. During October, another monitoring trip between Diamond Creek and Lake Mead is also conducted. As a result, you may encounter two 33-ft motorized rafts, which transport project staff, equipment, and gear. In addition, two 16-ft sport boats are used for night electrofishing and netting operations. The sample sites monitored during the spring trip are distributed throughout the river corridor and electrofishing is used to capture fish. The summer and fall trips focus on known locations of humpback chub, using hoop and trammel nets to capture fish. One of the added benefits of fall monitoring has been the recapture of tagged humpback chub that were experimentally translocated by the NPS from the Little Colorado River to Shinumo Creek, and to Havasu Creek, tributaries to the Colorado River. Information collected about the recaptured fish helps NPS managers evaluate the success of these translocation efforts. Fish monitoring trips camp close to sampling locations to minimize night travel; however, because field operations take place at night, special care is taken to avoid disrupting occupied camp areas near sampling locations.



Little Colorado River Fish Monitoring and Your Visit

The Little Colorado River is the spawning site for the largest population of humpback chub in the Colorado River Basin, the only place in the world this species is found. Other native fishes, including bluehead sucker (*Catostomus discobolus*), flannelmouth sucker (*Catostomus latipinnis*), and speckled dace (*Rhinichthys osculus*) spawn in the Little Colorado River, as do nonnative species, including channel catfish (*Ictalurus punctatus*), fathead minnow (*Pimephales promelas*), red shiner (*Cyprinella lutrensis*), common carp (*Cyprinus carpio*), black bullhead (*Ameiurus melas*), and plains killifish (*Fundulus zebrinus*).

Biologists, volunteers, and their supplies are flown by helicopter to three camps on the Navajo Nation that are near the Little Colorado River and upstream of its confluence with the Colorado River. The helicopter landing sites are outside of Grand Canyon National Park and flights are not noticeable to park visitors. USFWS crews spend up to 10 days sampling three reaches of the Little Colorado, each approximately 3 miles long. AZGFD biologists monitor the lower reach of the Little Colorado River and spend 20 to 30 days during April and May using hoop nets to capture humpback chub



and other fish. Should your trip stop to visit the Little Colorado River, you may see hoop nets under the water or slightly exposed above the water and attached to the shore by rope. *Please do not disturb the nets or move the rope attached to shore.*

Sampling Methods

Colorado River fish populations are sampled using electrofishing, which is a nonlethal capture method. Beginning at dusk, crews work out of sport boats outfitted with a system that applies an electrical field to the water through steel spheres suspended from the bow and stern of the boat. The fish respond by swimming toward the spheres, where they are captured and placed in a live well. Electrofishing transects are marked along the shoreline with small reflective batons that are removed after sampling is completed; nets are attached to the shoreline with ropes and may be marked with small buoys. Because

electrofishing is not generally a successful method of capturing humpback chub, they are sampled by using hoop and trammel nets in the mainstem. Hoop nets are also used in the Little Colorado River to capture humpback chub and other fish species. Hoop nets are a passive sampling gear type, meaning that the fish enter the nets by their own movement upstream. The nets are checked each day.

Passive Integrated Transponder (PIT) tags are used to keep track of captured fish >100 mm (about 4 inches) in length in both the mainstem and Little Colorado River. These tags, roughly the size of a grain of rice, are carefully inserted into the fish. Each tag has a unique number and can last more than 20 years. Information such as length, sex, reproductive status, and tag number are recorded for each captured fish before it is released back into the water.



Background & Findings

Native and nonnative fish monitoring outlined above occurs under the auspices of the Glen Canyon Dam Adaptive Management Program, a Federal initiative to mitigate impacts to downstream resources resulting from the operation of Glen Canyon Dam. Since 2000, biologists have monitored both the mainstem fish community and the Little Colorado River humpback chub population, while monitoring of the lower reach of the Little Colorado River has been ongoing since 1987. In particular, monitoring the endangered humpback chub population allows biologists to provide resource managers with critical information about the effects of ongoing Colorado River

management activities. For example, analysis of recently collected data indicates that the number of Grand Canyon adult humpback chub—fish 4 years old and older and capable of reproduction—increased approximately 50 percent between 2001 and 2008. The estimated number of adult chub in the Grand Canyon population is between 6,000 and 10,000 individuals.

For more information contact:

David Ward
U.S. Geological Survey
Grand Canyon Monitoring and Research Center
928-556-7280 or dlward@usgs.gov
Monitoring reports are available at <http://www.gcmrc.gov/library>

Should you encounter a fish monitoring trip during your visit, please stop and learn more about the study!

Cooperators:

