



Humpback Chub Tributary Translocations



In 2009, the National Park Service began a project to translocate juvenile humpback chub from the Little Colorado River to other Grand Canyon tributaries. These translocations may become part of a comprehensive conservation effort to help ensure that this native fish continues to survive in Grand Canyon. Tributary translocations may lead to satellite spawning populations of humpback chub and may increase the number of humpback chub that live in the Colorado River.

A Species at Risk

The humpback chub (*Gila cypha*) is an unusual-looking member of the minnow family that is endemic, or unique, to the Colorado River basin. These fish are characterized by large fins and pronounced humps behind the heads of adults.

The humpback chub is protected under the Endangered Species Act. Today, only six populations of humpback chub remain, with the largest in Grand Canyon.

The decline of the humpback chub is due to a variety of significant human-caused changes to the Colorado River. In Grand Canyon, humpback chub face a dam-altered ecosystem as well as competition with and predation by non-

native fish such as rainbow and brown trout. Non-native parasites and the possibility of a catastrophic event such as a hazardous materials spill into the Little Colorado River are also significant threats.

Humpback chub spawn in the Little Colorado River where warm water and suitable spawning habitat is available, while water released from Glen Canyon Dam is too cold for reproduction. Historically, humpback chub would have also used other tributaries besides the Little Colorado River, but currently may be excluded from such tributaries due to competition and predation by non-native fish species.

Tributary Translocations

Tributary translocations are a multi-faceted recovery tool for native fish. They may lead to the establishment of additional spawning populations, thereby increasing the species' odds of survival. Tributaries also provide rearing, or grow-out, habitat for young chub. Fish that are larger when they reach the river have a greater chance of survival and may add to the number of humpback chub that live in Grand Canyon.

Researchers identified Havasu, Shinumo, and Bright Angel creeks as the most suitable tributaries for humpback chub in the park outside of the Little Colorado River.

The young humpback chub that were released were collected the previous years from the Little Colorado River, flown out of the canyon via helicopter, and driven to hatcheries for treatment to remove parasites and kept overwinter. Prior to translocation they were implanted with unique PIT (passive integrated transponder) tags to individually identify each fish for monitoring purposes. On translocation day, humpback chub were flown via helicopter to the release sites where they were acclimated to creek water and released.

Shinumo Creek

Shinumo Creek is a small, clear tributary stream with a barrier falls just above its confluence with the Colorado River that isolates acceptable humpback chub habitat from non-native predatory fish in the Colorado River. A total of 902 humpback chub were translocated to Shinumo Creek between 2009 and 2011 in the first translocations of humpback chub within Grand Canyon National Park.



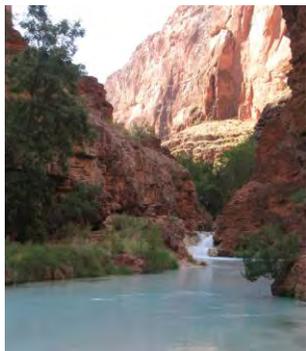
A humpback chub caught during monitoring in June 2011 that has begun development of the species' characteristic hump behind its head. Translocated juveniles do not have these humps.

Data collected during monitoring are used to assess the survival, growth, and movements of translocated humpback chub. The annual growth rates of translocated humpback chub in Shinumo Creek are comparable to or higher than growth rates in elsewhere in Grand Canyon. As of 2011, some humpback chub released in Shinumo Creek have reached minimum spawning size, at three to four years of age. The next milestone for this population will be detection of spawning behavior and/or successful reproduction.

Emigration out of the creek and predation by non-native rainbow trout remain concerns for long-term success of the Shinumo project. While the barrier waterfall just above the confluence with the Colorado River keeps non-native predatory fish out of Shinumo Creek, it also prevents humpback chub that go over the falls from returning to the creek. However, some translocated fish that left Shinumo Creek appear to be living in the Colorado River. In 2010 and 2011, biologists from cooperating federal agencies captured a number of humpback chub from the Shinumo translocations in the Colorado River.

NPS fisheries biologists will continue to monitor humpback chub and other native fish in Shinumo Creek in 2012.

Havasu Creek



Havasu Creek is very similar in physical habitat and water chemistry to the Little Colorado River, where most humpback chub are found, making it an ideal location to expand on the translocation effort. The translocation site is below Beaver Falls inside the park boundary. Eight mature humpback chub were captured during baseline surveying in Havasu Creek just prior to the translocation. Their presence demonstrates that Havasu Creek provides good humpback chub habitat.

In late June 2011, 243 juvenile humpback chub were translocated to Havasu Creek in the first of three planned releases to take place. More than 40% of translocated chub were captured during

monitoring in October 2011, and preliminary data indicate that the fish have a high growth rate. Additional translocations are planned for Havasu Creek in 2012 and 2013.

Logistics of the fisheries work in Havasu Creek are designed to minimize interference with boaters at the mouth of Havasu Creek and with the area's wilderness characteristics. Field crews are either dropped off at the mouth via the river and hike out to Hualapai Hilltop, or hike in and out of the field site. Helicopter transport of humpback chub was determined to have the least impact to park resources and visitor experience, while minimizing stress to the fish.

The project is funded by the National Park Service and the Bureau of Reclamation, and is being conducted in cooperation with the U.S. Fish and Wildlife Service, Arizona Game and Fish Department, USGS Grand Canyon Monitoring and Research Center, and other partners.

