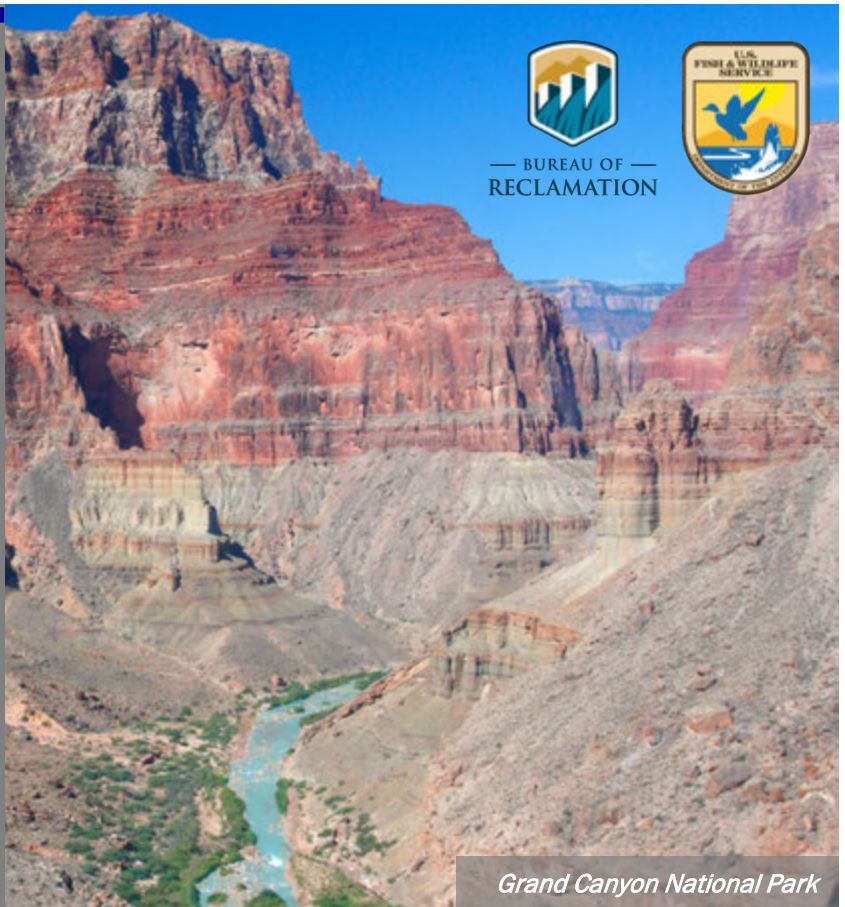
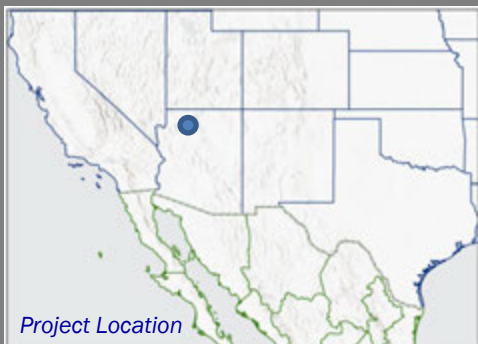


RESTORATION

Humpback Chub Translocations in Three Grand Canyon Tributaries



Grand Canyon National Park is home to several unique species of native fishes. This assemblage historically included three native species of chub, which resided within the seasonally warm, swift, and turbid tributaries and mainstem of the Colorado River that flows through its steep canyon walls. Humpback Chub (*Gila cypha*), however, is the only remaining species of chub that is found today in Grand Canyon National Park. This species was federally-listed as Endangered in 1967. To protect this species, fishery biologists and park managers in Grand Canyon National Park are working to expand local populations of Humpback Chub.



KEY ISSUES ADDRESSED

Humpback Chub populations have been reduced due to changing environmental conditions, including hydroelectric dam construction and water withdrawals. This includes Glen Canyon Dam located north of Grand Canyon National Park. Key hydrological factors that impact populations downstream of the dam include cooler summer water temperatures when spawning occurs, more stable flows with less backwater environments essential for young Humpback Chub growth and survival, and clear water which increases vulnerability to predation. Introduced Brown and Rainbow Trout are better equipped for these conditions and outcompete or prey upon native chub. Low population numbers of Humpback Chub reduce population redundancy, which in turn makes this species less resilient to environmental disturbances.

PROJECT GOALS

- Expand self-sustaining populations of Humpback Chub in Grand Canyon National Park
- Translocate Humpback Chub from the Little Colorado River to Shinumo, Havasu, and Bright Angel Creek tributaries
- Decrease predation of Humpback Chub by non-native trout

TRANSLOCATION SUCCESS

Growth rates and survival of juvenile Humpback Chub in Havasu Creek have been equal to or greater than in the source population from the Little Colorado River.



Adult Humpback Chub from Havasu Creek

PROJECT HIGHLIGHTS

Prioritizing Grand Canyon Tributaries: Widespread baseline surveys were conducted to determine tributaries with suitable conditions for Humpback Chub.

Moving Humpback Chub: Young chub were captured as fingerlings in early summer from the Little Colorado River source population, reared in a hatchery to grow, then flown by helicopter to their new homes the following spring or summer.

Shinumo and Havasu Creeks Translocations: 302 chub were first relocated to Shinumo Creek in 2009, with several hundred more to follow with multiple translocations in Shinumo Creek (2009-2013) and Havasu Creek (2011-2016).

Trout Removal and Chub Translocations in Bright Angel Creek: In conjunction with identifying suitable habitat conditions, non-native Brown and Rainbow Trout were removed before expanding Humpback Chub translocations to Bright Angel Creek in 2018.

Collaborators

- Numerous federal and state agencies
- Utah State University
- University of Missouri
- University of Florida
- Grand Canyon Conservancy
- Arthur L. & Elaine V. Johnson Foundation

Funding Partners

- National Park Service
- U.S. Bureau of Reclamation

Lead Author: Alex Koeberle, University of Arizona, March 2020.

Case study support by US Fish and Wildlife Service and US Bureau of Reclamation.

Photos courtesy of National Park Service.



LESSONS LEARNED

Grand Canyon National Park tributaries have been uniquely successful for translocations because they have mostly natural, unaltered flows that provide conditions similar to those on the Colorado River before hydroelectric dam development.

Detailed baseline surveys and thorough suppression and removal of non-native trout are both needed for success. Havasu Creek was determined to be the area most likely to support a Humpback Chub population because it is most similar to the Little Colorado River, and non-native predators are rare. Since ending translocations in 2016, biologists have documented increasing numbers of young of year chub, mature adults, and recruitment from spawning in Havasu Creek.

Translocations to Shinumo Creek were initially successful, with translocated individuals surviving and growing until a fire and flash flood in 2014 extirpated this population.

NEXT STEPS

- Continue monitoring for unmarked young-of-year chub, as an indication of reproduction
- Supplement populations in Bright Angel and Havasu Creeks through additional translocations of juvenile Humpback chub, including a translocation to Bright Angel Creek in 2020
- Continue to inventory other ecological vulnerabilities to Humpback Chub in tributaries

PROJECT RESOURCES

For more information on this project, contact Brian Healy:
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For additional project resources and case studies, scan the QR code below or visit the CCAST website:

WWW.DESERTLCC.ORG/RESOURCE/CCAST



First Unmarked Young-of-Year Humpback Chub in Havasu Creek