

Native Fish Sanctuaries of the Lower Colorado River

Cibola High Levee Pond Desert Pupfish Pond

Razorback suckers feeding near the surface at High Levee Pond.



USGS and FWS biologists studying the fish at High Levee Pond.



Young bonytail love to hide in the entrance of beaver dens where they are safe from bird predators.



A natural colored (top) and unusual "golden" bonytail found in High levee pond.



Historically, the Colorado River was one of the most formidable rivers in the world. Each spring, melting snow from the mountains scoured the desert landscape moving millions of tons of sediment to the sea. The Grand Canyon lays testament to its erosive nature. Summer heat would bring seasonal droughts, reducing the river to a trickle impacting humans, animals, and fish.



Laguna Dam during the flood of 1922.

Isolated by high mountains and harsh deserts, its fish community developed unique and specialized traits that helped them survive raging floods and prolonged droughts. Conditions were so unique that three quarters of the fish species are found nowhere else in the world.

The lower river contained nine freshwater fish species, but today, only three freshwater forms remain. Others have long disappeared due to introduced gamefish and water development that changed the landscape. Of the original nine fishes, seven are federally listed as endangered, including the three described here. The remaining two have retreated further upstream and are species of concern.

Colorado River water is used by more than 22 million people in the USA and Mexico. Large reservoirs store spring runoff which historically flowed to the sea. Remaining portions of the river were straightened and deepened to more effectively deliver water to downstream users. As a result, the river no longer physically, nor biologically, resembles the river of a century ago.

Native fish do spawn but their young are eaten by introduced predators like channel catfish, largemouth bass, bluegill, striped bass, crappie. Nearly 45 species have been successfully introduced. Self-sustaining populations of natives are simply gone and their continued existence in the river is dependent upon stocking.

Native fish do prosper when stocked in ponds by themselves. Here they form semi-natural communities where young survive and complete their live cycle. Cibola and Imperial National Wildlife Refuges contain two such sanctuaries: the Desert Pupfish Pond found near the Visitor Center and Big-River fish sanctuaries located adjacent to the river.



"The River" in 1938



"The Canal" in 2000 (same location as above)

General Information Product 9

U.S. Department of the Interior
U.S. Geological Survey

For more information on the native fish and history of the lower Colorado River, the U.S. Geological Survey, and the U.S. Fish and Wildlife Service, visit the following internet sites:

www.fort.usgs.gov/products/publications/10026/10026.asp

www.usgs.gov

www.fws.gov

Desert Pupfish

Cyprinodon macularius



Female



Male

- Desert pupfish are small, typically measuring less than 2.5 inches. Mature males are typically larger than females and become quite colorful during breeding season. Their bodies turn a beautiful bright blue with bright yellow tails. Females are small and have dark brown or olive bars.
- Pupfish can tolerate salinities more than twice that of seawater. They thrive in habitats where few other fish can survive. They occur in desert springs and shallow, sandy margins of small streams where they feed on a wide variety of small invertebrates and algae.
- They are short-lived, seldom living more than a year. Fish reach sexual maturity within 6 weeks. Males are territorial, aggressively protecting an area of about a square yard. Spawning occurs between April and October. Females lay up to 800 eggs which hatch in about 10 days. Larval fish measure less than a quarter of an inch.
- **Where To See**--Pupfish can normally be seen every day in the refuge next to the Visitor Centers. Larger males can be seen aggressively guarding their territories.

Bonytail Chub

Gila elegans



- The bonytail is a member of the minnow family (Cyprinidae) and is only found in the Colorado River. It has a streamlined body with an extremely thin or “bonytail.” It has small, trout-like scales and is darkish-gray in color. Large fish develop a prominent dorsal hump at the base of the head.
- A great deal of its early life ecology was learned at High Levee Pond. The fish spawn along the shore where gravels have been disturbed by beaver. Spawning occurs in early April and usually results in thousands of young.
- The bonytail is long-lived (30+ years) as is the razorback sucker. Three bonytail taken from Lake Mohave were estimated to be 34 to 49 years old. Scientists speculate that longevity was an adaptation for an extremely harsh environment when conditions did not always allow for annual spawning.
- **Where To See**--The bonytail is the most secretive of the three, hiding in aquatic vegetation, underwater brush and in larger rip-rap (rock). Young fish can be detected on calm days after sunset. They cause a rippling effect on the surface as they feed on emerging insects and zooplankton.

Razorback Sucker

Xrauchen texanus



- Razorback sucker is only found in the Colorado River and is the largest of several suckers found in the basin. It reaches weights up to 18 pounds and lengths of over 2 feet. Its body is elongated and adults have a unique dorsal keel protruding from behind their head. The keel’s purpose is unknown, but theories include its use to stabilize the fish in swift water and as a structure to prevent adults from being eaten by large predators. It has a large sucker-like mouth with fleshy lips and papillae (small bumps) that helps the fish “feel” for food in the muddy waters. They eat plankton and small insects.
- Females become sexually mature their 4th or 5th year. A large mature female can lay as many as 200,000 eggs. Spawning occurs from January through March. These fish are also long-lived. Unlike the pupfish, females are 10 to 20% larger than similar aged males.
- **Where To See**--During winter months (January-March) spawners can be seen spawning along shore. These activities often leave sediment plumes. They also school along the surface to feed on zooplankton during the day.

Their Future?

- The future of these fish is extremely bleak. Humans have devastated the ecosystem where they once prospered. The vast expanses of floodplain wetland where these fish evolved are nearly gone. It is estimated that only 5% of those habitats remain.
- They were once the most common fishes in the region and today they are restricted to a few small populations and habitats. The lower Colorado River has the dubious distinction of being one of the largest rivers in the world with a totally replaced fish community.
- Today, the river and its reservoirs contain no desert pupfish, no wild born bonytail, and very few old razorback suckers that will die off this decade. Bonytail and razorback suckers are being stocked to prevent their extirpation but natural recruitment in the wild continues to be prevented by non-native predators.
- Societies’ dependence upon water makes native fish recovery economically and politically unlikely and perhaps impossible. Our society has neither the technology nor willingness to remove economically important recreational fishes to the extent necessary to benefit native communities.
- High Levee Pond represents the only place on earth where the bonytail and razorback sucker coexist in a natural fish community. Resource management agencies are attempting to recreate this community but the task is difficult, expensive, and sometimes controversial.
- The continued existence of these fish depends upon the support of the concerned public and state and federal resource agencies.