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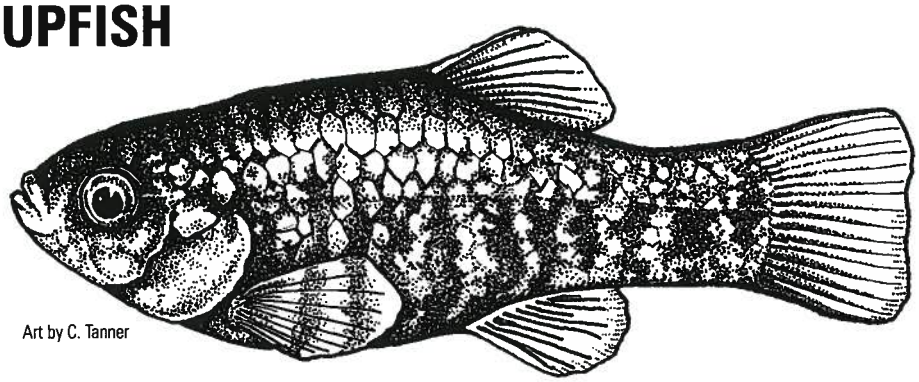
Monkey Spring Pupfish



Art by C. Tanner

SCIENTIFIC NAME: *Cyprinodon* species. The genus is derived from the latin root cyprin, meaning a type of carp. Until 1973, all Arizona pupfishes were considered as one species, *Cyprinodon macularius*. However, the Monkey Spring pupfish became recognized as a separate species in 1973, based on morphological differences. A new species name was never published, as by that time the population was already extinct.

DESCRIPTION: All pupfish are small. Adults are 1/2 to 2 inches in length, with a chubby body. Mature breeding males are often iridescent sky-blue, with lighter colored, vertically oriented lateral bars. The paired, dorsal, and anal fins are blackened. The caudal fins are rarely light in color, and never yellow or orange. Females and juveniles are silvery, with darker vertical bars along the body, and colorless fins.

DISTRIBUTION: This species is known historically from only one spring system, Monkey Spring, near Sonoita (Santa Cruz County), Arizona. It has the dubious distinction of being the only native Arizona fish to have become extinct, although several other species (big river fish) are on the verge of extinction. Two closely related species, the desert pupfish (*Cyprinodon macularius macularius*) and Quitobaquito pupfish (*Cyprinodon macularius eremus*), are rare in Arizona.

HABITAT: Pupfishes in general were historically characteristic of marshes and springs, but especially complex backwater and off-channel habitats of larger streams and rivers. They can withstand extreme environmental conditions, such as the high conductivities (twice that of seawater) and water temperatures (up to 110 degrees) often found in desert climates. Monkey Spring pupfish were historically confined to the marshes and travertine pools formed by Monkey Spring, a constant temperature spring that was isolated from Sonoita Creek by a 20-foot high travertine waterfall.

BIOLOGY: Monkey Spring pupfish became extinct before many studies could be completed on their specific biology. They were physically similar to desert pupfish, but were much more secretive and "nervous" in captivity. Males were brightly colored and much more active than females. Males actively excavated and defended pits in soft mud bottoms in search of food, a behavior often mistaken as nest building. Breeding occurred from late spring through early fall. Females deposited eggs randomly within the territory of a male, who fertilized them and pugnaciously defended the territory from intruders. The eggs hatched within several days, and the young fed on small invertebrates and plant debris. As the young grew, they added larger invertebrates, such as mosquito larvae, to their diet. In warm, shallow habitats with abundant food, sexual maturity could be attained in about six weeks. Adults fed on invertebrates and chunks of plant material taken from commonly found marsh vegetation. Monkey Spring pupfish rarely lived more than one year.

This species became extinct as a result of several events. In 1968, largemouth bass decimated a pupfish population in a pond fed by Monkey Spring. Pupfish held in captivity failed to reproduce, and died in 1971. Attempts to re-establish a population in the springhead pool failed. Monkey Spring was also inhabited by two other species of native fish, the Gila chub (*Gila intermedia*) and Gila topminnow (*Poeciliopsis occidentalis occidentalis*). The Gila chub was also eliminated from the Monkey Spring system by largemouth bass, but Gila topminnows still persist there. Gila chubs likely preyed upon the smaller topminnow and pupfish, but other interactions are not known.

STATUS: The Monkey Spring pupfish is almost certainly extinct, though faint hope persists that a remnant population may yet be discovered.

MANAGEMENT NEEDS: There are no management options for the Monkey Spring pupfish. It became extinct as a direct result of the actions of humans. Of the remaining 31 species of fish native to Arizona, 11 are Federally listed as endangered and seven are listed as threatened. It will take a concerted effort from all of us to prevent the extinction of additional members of our remaining native fish fauna.