

**ARIZONA GAME AND FISH DEPARTMENT  
HERITAGE DATA MANAGEMENT SYSTEM**

**Animal Abstract**

**Element Code:** AFCJB37140

**Data Sensitivity:** No

**CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE**

**NAME:** *Tiaroga cobitis*  
**COMMON NAME:** Loach Minnow  
**SYNONYMS:** *Cliola cobitis*, *Rhinichthys cobitis*  
**FAMILY:** Cyprinidae

**AUTHOR, PLACE OF PUBLICATION:** Girard, C. 1857. Researchers upon the cyprinoid fishes inhabiting the freshwaters of the United States of America, west of the Mississippi valley, from specimens in the Museum of the Smithsonian Institution. Proceedings of the Academy of Natural Sciences of Philadelphia 8(1856):165-213.

**TYPE LOCALITY:** San Pedro River, Arizona.

**TYPE SPECIMEN:**

**TAXONOMIC UNIQUENESS:** Monotypic genus

**DESCRIPTION:** Small, stream dwelling, minnow rarely exceeding 65.0 mm (2.6 in.) in length. Elongated body is a little compressed, and flattened vertically. Mouth is small, terminal, and highly oblique with no barbels present. Upper lip is non-protractile and is attached to the snout by a broad fold of tissue. Gill openings are restricted. Two rows of pharyngeal teeth, dental pattern is 1,4-4,1 (Minckley 1973).

Loach minnow have an olivaceous background coloration highly blotched with darker pigment. Whitish spots are present at the origin and insertion of the dorsal fin as well as the dorsal and ventral portions of the caudal fin base. A black basicaudal spot is usually present. There are 65 scales in the lateral line. The dorsal fin contains 8 rays, and the anal contains 7. Breeding males develop bright red-orange coloration at the bases of paired fins, on adjacent fins, on the base of caudal opening, and often on abdomen. Breeding females become yellowish in color on their fins and lower body (Minckley 1973).

**AIDS TO IDENTIFICATION:** Distinguished from the similar speckled dace by whitish spots that are present on the origin and insertion of the dorsal fin as well as on the dorsal and ventral portions of the caudal fin base.

**ILLUSTRATIONS:** B&W drawing (Marsh 1991:i.)  
B&W photos (Minckley 1973:133)  
Color line drawing (Page and Burr 1991)  
Color photos (Rinne and Minckley 1991:16)  
B&W photo (Wildlife Habitat Management Staff Group 1975:23)

**TOTAL RANGE:** Historically was endemic to Gila River Basin near and upstream of Phoenix, and included the Agua Fria, Gila, Salt, San Pedro, and Verde River systems in Arizona. It was also found in New Mexico, and Sonora, Mexico. Today they are found in Arizona only in Aravaipa Creek, the Blue River, and irregularly at the confluence of the north and east forks of the White River and the San Francisco River, between Clifton and the New Mexico border (Propst et al. 1985). In New Mexico, the loach minnow now occupies just over half of its range and has been extirpated in Sonora, Mexico.

**RANGE WITHIN ARIZONA:** Historically in Arizona, the loach minnow occupied as much as 2,000 stream km (1,243 miles), but it is now found in less than 200 stream km (124 miles) (Propst et al. 1987). Loach minnow persists in Arizona only in limited reaches in White River (Gila County), North and East forks of the White River (Navajo County), Aravaipa Creek (Graham and Pinal counties), San Francisco and Blue rivers, and Campbell Blue and Eagle creeks (Greenlee County). Known populations once present in other rivers and streams of the state have been eliminated. Loach minnow is rare to uncommon in Arizona, except in Aravaipa Creek and Blue River. Unknown populations of the species may still occur in places not surveyed or incompletely inventoried, especially within the expansive San Carlos Apache and Fort Apache Indian reservations.

## **SPECIES BIOLOGY AND POPULATION TRENDS**

**BIOLOGY:** Loach minnow are short lived. Few, if any, live through the fourth year. Populations of loach minnow vary both spatially and temporally as a result of natural changes in their environment and differing dynamic characteristics of individual populations.

**REPRODUCTION:** Spawning was observed to take place in late winter to early spring in Aravaipa Creek and from late March to early June in New Mexico. First spawn occurs in their second year. Spawning occurred in the same riffles that were occupied by adults during the non-reproductive season. Adhesive eggs are deposited on the underside of flattened rocks. The nest cavities are usually open on the downstream side while the upstream portion of the rock is embedded in the substrate. The male, and possibly the female, guards the nest cavity. The number of eggs per rock ranges from 5 to more than 250, with means of 52 to 63 (Marsh 1991). Individual females contain from 150 to 1200 mature ova. Eggs incubated at 18 to 20 °C hatched in five to six days.

**FOOD HABITS:** Loach minnow are opportunistic benthic insectivores, feeding mainly upon riffle-dwelling larval ephemeropterans, simuliid, and chironomid dipterans. They actively seek their food among bottom substrates, rather than pursuing items in the drift.

**HABITAT:** The cryptic, solitary, and sedentary loach minnow occupies turbulent, rocky riffles of mainstream rivers and tributaries. They prefer moderate to swift current velocity and gravel or cobble substrates. Sometimes associated with dense, filamentous green algae. It is restricted almost exclusively to a bottom dwelling habitat because of a reduced gas bladder.

**ELEVATION:** Up to about 8,240 ft (2513 m). Based off of records in the Heritage Data Management System (HDMS), elevation ranges from 2,325 - 8,240 ft. (709 - 2513 m) (AGFD, unpublished data accessed 2001).

**PLANT COMMUNITY:** Prefers an open, low growing riparian type community composed mostly grass and shrubs.

**POPULATION TRENDS:** Loach minnow was once locally common throughout much of the Verde, Salt, San Pedro, San Francisco, and Gila (upstream from Phoenix) river systems, occupying both the mainstream and perennial tributaries up to about 2,200 m (7,218 ft.) elevation. This range has been dramatically reduced and fragmented because of habitat destruction, and competition and predation by introduced fish species. Loach minnow are believed to be extirpated from Mexico, although the Gila River drainage in that country still lacks adequate surveys. Its distribution in New Mexico is fragmented. According to Marsh (1991), unknown populations of the loach minnow may still occur in places not surveyed or completely inventoried, especially in Mexico, and within the expansive San Carlos Apache and Fort Apache Indian reservations, or on National Forest lands in the United States.

## **SPECIES PROTECTION AND CONSERVATION**

**ENDANGERED SPECIES ACT STATUS:** LT (USDI, FWS 1986)  
Critical Habitat Removed (Court Order No. CIV 02-0199 JB/LCS, 08-31-2004)  
[Critical Habitat Listed (USDI, FWS 2000)]  
[Critical Habitat Listed (USDI, FWS 1994)]

**STATE STATUS:** WSC (AGFD, WSCA in prep)  
[State Threatened AGFD, TNW 1988]

**OTHER STATUS:** Forest Service Sensitive (USDA, A-S National Forest 2000)  
[Forest Service Sensitive, USDA, FS Region 3 1988]  
Listed Endangered (Secretaría de Medio Ambiente 2000)  
[Listed Endangered Secretaría de Desarrollo Social 1994]

**MANAGEMENT FACTORS:** Dewatering of stream reaches, impoundment, livestock grazing, habitat alteration, and introduced non-native fish have been the greatest threats to loach minnow populations. Non-native predatory fish species in particular include piscivorous catfishes (*Ictalurus punctatus*, *I. melas*, *I. natalis*, and *Pylodictus olivaris*), and the red shiner (*Notropis lutrensis*). **Management needs:** conserve, protect, and monitor existing populations; delineate priority waters; ameliorate impacts from nonnative predatory and competitive species from loach minnow waters; develop captive propagation techniques; enhance or restore select habitats within historical range; reintroduce into select historical habitats.

**PROTECTIVE MEASURES TAKEN:** Loach minnow was proposed (USDI, Fish and Wildlife Service [USFWS] 1985) and subsequently listed (USFWS 1986) as a threatened species. Critical habitat was proposed (USFWS 1985) and signed into effect on March 8, 1994. It was set aside by court order (10<sup>th</sup> Cir.) In 1996, and redesignated April 25, 2000 (USFWS 2000). **Critical habitat includes: Complex 1** - Verde River (171.3 km), Fossil Creek (7.6 km), West Clear Creek (11.6 km), Beaver Creek/Wet Beaver Creek (33.4 km), Oak Creek (54.4 km), Granite Creek (2.3 km); **Complex 2** - East Fork Black River (8.2 km), North Fork of the East Fork Black River (18.0 km), Boneyard Creek (2.3 km), Coyote Creek (3.1 km), West Fork Black River (10.3 km); **Complex 3** - Tonto Creek (70.3 km), Greenback Creek (13.5 km), Rye Creek (2.1 km); **Complex 4** - Gila River (62.8 km), San Pedro River (21.4 km), Aravaipa Creek (45.3 km), Turkey Creek (4.3 km), Deer Creek (3.6 km); **Complex 5** - San Pedro River Lower (73.6 km), Redfield Canyon (22.3 km), Hot Springs Canyon (19.1 km), Bass Canyon (5.1 km), San Pedro River Upper (60.0 km); **Complex 6** - Gila River (36.3 km, AZ), Bonita Creek (23.5 km, AZ), Eagle Creek (72.8 km, AZ), San Francisco River (203.3 km, AZ and NM), Tularosa River (30.0 km, NM), Negrito Creek (6.8 km, NM), Whitewater Creek (1.8 km, NM), Blue River (81.9 km, AZ and NM), Campbell Blue Creek (13.1 km, AZ and NM), Dry Blue Creek (4.7 km, NM), Pace Creek (1.2 km, NM), Frieborn Creek, 1.8 km, NM), Little Blue Creek (4.5 km, AZ); **Complex 7** - Gila River (164.4 km, NM), East Fork Gila River (42.1 km, NM), Middle Fork Gila River (19.1 km, NM), West Fork Gila River (12.4 km, NM). A Loach Minnow Recovery Plan was prepared by the USFWS (1990). An artificial propagation project with loach minnow was completed in 2004.

**SUGGESTED PROJECTS:** Protect existing populations of loach minnow. Monitor status of existing populations. Identify nature and significance of interaction with non-native fishes. Quantify, through research, loach minnow habitat needs and the effects of physical habitat modification on life cycle completion. Enhance or restore habitats occupied by depleted populations. Reintroduce populations to selected streams within historic range. Determine quantitative criteria for describing a self-sustaining population. Consider contingency planning and preliminary investigations for captive holding, propagation and rearing. Information and education (USDI, FWS 1990).

**LAND MANAGEMENT/OWNERSHIP:** BIA; BLM - Safford Field Office; USFS - Apache-Sitgreaves National Forest; TNC - Aravaipa Canyon and Muleshoe Ranch Preserves; Private.

## **SOURCES OF FURTHER INFORMATION**

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**MAJOR KNOWLEDGEABLE INDIVIDUALS:**

- Paul Marsh - Arizona State University, Tempe.  
D.L. Propst - New Mexico Department of Game and Fish, Albuquerque.  
Kirk Young - Arizona Game and Fish Department, Phoenix.

**ADDITIONAL INFORMATION:**

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