

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

**Animal Abstract**

**Element Code:** AFCJB13090

**Data Sensitivity:** No

**CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE**

**NAME:** *Gila ditaenia*  
**COMMON NAME:** Sonora Chub  
**SYNONYMS:** *Richardsonius gibbosus*  
**FAMILY:** Cyprinidae

**AUTHOR, PLACE OF PUBLICATION:** R.R. Miller, Copeia 1945(2): 104-110. pl. 1. 1945.

**TYPE LOCALITY:** Rio Magdalena, 0.5 km west of La Casita, Sonora, Mexico; approximately 40 km south of Nogales, Arizona.

**TYPE SPECIMEN:** USNM – 129954. Mearns, E.A. 1893; see Snyder, J.O. 1915. Miller, R.R. 1945.

**TAXONOMIC UNIQUENESS:** There are 7 species of the genus *Gila* in Arizona.

**DESCRIPTION:** Typically less than 200.0 mm (7.9 in.) in total length (rarely exceeds 125 mm (4.9 in.) in United States). Body moderately chubby, fusiform and terete. Scales relatively small, 63 to 75 in lateral line, bearing prominent radii on all fields. Eight fin rays in dorsal, anal, and pelvic fins; rarely 9 in dorsal and 7 in pelvic and anal fins. Pharyngeal teeth, 2, 5-4, 2 (Minckley 1973).

Coloration dark, with two prominent, black lateral bands above and below lateral line. Lower sides and belly lighter. Breeding colors red at bases of paired and anal fins, with some orange on belly and other ventro-lateral areas, basicaudal spot discrete, round oval in shape.

**AIDS TO IDENTIFICATION:** The round spot at base of tail is an excellent distinguishing characteristic.

**ILLUSTRATIONS:** B&W photo (Minckley 1973:108)  
Color photo (Rinne and Minckley 1991:25)  
B&W photo (Wildlife Habitat Management Staff Group 1975:12).

**TOTAL RANGE:** Endemic to streams of the Rio de la Concepcion drainage of Sonora, Mexico and Arizona. In Sonora, it inhabits the Rios Altar and Magdalena. In Arizona, it occurs in Sycamore Creek (Bear Canyon), a tributary of the Rio Altar, 25 km (15.5 miles) west of Nogales in Santa Cruz County (USFWS 1992).

**RANGE WITHIN ARIZONA:** Sycamore Creek, and two of its tributaries (Penasco Creek and an unnamed stream), Atascosa Mountains, Santa Cruz County.

## **SPECIES BIOLOGY AND POPULATION TRENDS**

**BIOLOGY:** Can persist in small isolated pools during periods of drought.

**REPRODUCTION:** Minckley (1973) indicated that spawning likely occurred during spring based on dates of collection of young-of-year. However, larval and juvenile Sonora chub were found in Sycamore Creek and in a tributary to Rio Altar in November, indicating that breeding is not limited by season (Hendrickson and Juarez-Romero 1990). Adults with breeding coloration were also taken during this period. Adults with breeding coloration have been observed April through September (USDI, Fish and Wildlife Service 1992). Carpenter (1992) and Bell (1984) have suggested that spawning occurs after spring and summer rains.

**FOOD HABITS:** Aquatic and terrestrial insects, and algae, in decreasing order of volume.

**HABITAT:** In Sycamore Creek, found most commonly in the largest, deepest, and most permanent pools, with bedrock-sand substrates, and areas free of thick pads of floating algae (Carpenter and Maughan 1993).

**ELEVATION:** Less than 305 to 1,219 m (1,000 - 4,000 ft.). Based on records in the Heritage Data Management System (HDMS), elevation ranges from 3,500 - 4,190 ft (1068 - 1278 m) (AGFD, unpublished data accessed 2001).

**PLANT COMMUNITY:** Riparian vegetation includes *Platanus* spp. (sycamore), *Populus fremontii* (cottonwood), *Alnus* spp. (alder), *Salix* spp. (willow), *Quercus* spp. (oak), *Pinus* spp. (pine) (Wildlife Habitat Management Staff Group 1975).

**POPULATION TRENDS:** As of 1992, the species was locally abundant in Sycamore Creek (Minckley and Deacon 1968, U. S. Fish and Wildlife Service 1992). Distribution of the Sonora chub in the United States is intact and should remain secure, barring major environmental change (Minckley 1983; Minckley 1985).

## **SPECIES PROTECTION AND CONSERVATION**

**ENDANGERED SPECIES ACT STATUS:** LT with Critical Habitat (USDI, FWS 1986)  
**STATE STATUS:** WC (AGFD, WSCA in prep)  
[State Endangered AGFD, TNW 1988]  
**OTHER STATUS:** No Forest Service Status (USDA, FS Region  
3 1999)  
[Forest Service Sensitive, USDA, FS Region

3 1988]

Listed Threatened (Secretaría de Medio Ambiente 2000)

[Listed Threatened Secretaría de Desarrollo Social 1994]

**MANAGEMENT FACTORS:** Sycamore Creek is intermittent and has been highly modified by human activities including grazing, mining, recreation, and the introduction of exotic taxa (USDI, Fish and Wildlife Service 1992). Sycamore Creek is at the edge of the range of the species, is isolated from other populations of Sonora chub, and has marginal habitat (Hendrickson and Juarez-Romero 1990). As such a series of environmental perturbations made worse by degraded watershed conditions could cumulatively result in extirpation of the species from the United States. The importance of a stable, undisturbed watershed for maintaining the environment needed for survival and reproduction of Sonora chub cannot be overstated (USDI, Fish and Wildlife Service 1992). Predation by exotic green sunfish is also a cause for concern.

**Threats:** reduced flows; drought; mining activity; predation by and competition with nonnative fishes; (in Mexico) hybridization with an undescribed chub (*Gila* sp.).

**Management needs:** improve and maintain watershed condition within chub habitat; protect stream flows; ameliorate effects of nonnative fishes within chub waters; establish a refuge population within historic range; periodic status monitoring.

**PROTECTIVE MEASURES TAKEN:** Listed as threatened under the Endangered Species Act, and listed as endangered by the state of Arizona. Critical habitat was listed at the time of the Federal listing to include Sycamore Creek, extending downstream from and including Yanks Spring. Also designated was the lower 2.0 km of Penasco Creek and the lower 0.4 km of an unnamed stream entering Sycamore Creek from the west, about 2.4 km downstream from Yanks Spring. In addition, critical habitat includes a 12 meter-wide riparian area along each side of Sycamore and Penasco Creeks.

The Wilderness Act; one half of the drainage is within Pajarita Wilderness and Gooding Research Natural Area. U.S. Fish and Wildlife Service produced a Recovery Plan for Sonora Chub (*Gila ditaenia*) in 1992; standardized survey techniques and needed studies were mentioned. Arizona Game and Fish has evaluated sites for reintroduction.

**SUGGESTED PROJECTS:** Specific studies as listed by the U.S. Fish and Wildlife Service (1992): (1) determine reproductive variables, (2) determine effects of predation and competition, (3) determine survivorship by age group, (4) determine disease and parasites, (5) determine diel seasonal, and annual distribution of life stages, (6) determine other factors pertinent to perpetuation of Sonora chub, (7) determine fish habitat relationships (see Carpenter and Maughan 1993), (8) determine precipitation-runoff relationships, (9) evaluate relationships of runoff-instream flow needs, (10) establish captive reserve populations, (11) determine the genetic variability of the species.

**LAND MANAGEMENT/OWNERSHIP:** USFS - Coronado National Forest.

## **SOURCES OF FURTHER INFORMATION**

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**ADDITIONAL INFORMATION:**

**Revised:** 1994-07-12 (ATR)  
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