

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

Animal Abstract

Element Code: AFCJB49080

Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Cyprinella formosa*

COMMON NAME: Beautiful Shiner; Yaqui Shiner

SYNONYMS: *Notropis formosus*, *Notropis mearnsi*, *Notropis formosus mearnsi*

FAMILY: Cyprinidae

AUTHOR, PLACE OF PUBLICATION: Girard, C. 1857. Proceedings of the Academy of Natural Science, Philadelphia [1856] 8:165-213.

TYPE LOCALITY: San Bernardino Creek, Cochise County, Arizona.

TYPE SPECIMEN:

TAXONOMIC UNIQUENESS: There are 22 species of the genus *Cyprinella* in North America. *C. formosa* is one of two species in Arizona, the other species is *C. lutrensis* (Red Shiner), which is not native to Arizona.

DESCRIPTION: Length up to 8.9 cm (3.5 in.). Body compressed, its depth about same as length of head. Snout relatively pointed. Mouth oblique. Lateral line slightly decurved, with 36 to 40 scales. Anal fin-rays 8 or 9. Dorsal and pelvic fin-rays 8. Pharyngeal teeth in a single row, 0, 4-4, 0 (Minckley 1973).

Nonbreeding coloration similar to that of *C. lutrensis*, but more orange on body and metallic or silvery laterally. Dorsolateral scales usually well outlined with melanophores. Males in breeding condition yellow-orange or orange on caudal and lower fins; dorsal fin darkened, with little, if any, milky-white pigment evident. Body bluish, but often masked with an overall wash of orange, pink, or yellow. Top of head reddened to orange; sides of head brassy to brassy-orange (Minckley 1973).

AIDS TO IDENTIFICATION: Nearly identical to red shiner (*C. lutrensis*), but has orange or yellow back and silver side, and red-orange caudal peduncle. Has 8 anal rays and 34-47 lateral scales, whereas red shiner has 9 anal rays, and 32-36 lateral scales (Page and Burr 1991).

ILLUSTRATIONS: Color photo (Mayden 1989)
B&W photo (Minckley 1973:138)

Color photos (Rinne and Minckley 1991:18)

B&W photo (Wildlife Habitat Management Staff Group 1975:148)

TOTAL RANGE: Historical range included the Rios Yaqui, Casas Grandes, Santa Maria, and Santa Clara drainages in Sonora and Chihuahua, Mexico, the Rio Yaqui (San Bernardino Creek) in Arizona, and the Mimbres River, New Mexico. The Yaqui shiner was extirpated from the United States in 1969-1970 (Minckley 1973), but as of 1991, still found in most of its historic range in Mexico. It was re-introduced into San Bernardino National Wildlife Refuge in the United States in 1990.

RANGE WITHIN ARIZONA: Extirpated from San Bernardino Creek, Cochise County by 1970. Reintroduced into four ponds on the San Bernardino National Wildlife Refuge in 1990.

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: Abarca (1991) discussed some native predators of *C. formosa*, Mexican garter snakes and a variety of mammals and birds. Also noted were the problematic, introduced fish and bullfrogs of the San Bernardino Creek area.

REPRODUCTION: Reproduction habits are not well documented. Rinne and Minckley (1991) suggest that the spawning act presumably consists of spreading the eggs over aquatic vegetation, brush, other cover or simply over the bottom. Abarca (1991) suspects reproduction occurs principally from May through July.

FOOD HABITS: This species feeds on drifting aquatic and terrestrial invertebrates (Rinne and Minckley 1991). This shiner, like its close relatives, is likely an omnivore (Abarca 1991).

HABITAT: This species occurs mainly in pools of small to medium streams with sand, gravel and rock bottoms. It has been introduced into man-made ponds. Hendrickson et al. (1980) reported the largest populations found in the Rio Yaqui area were on riffles of smaller streams, or in intermittent pools of creeks that have a high percentage of riffle habitat in wetter periods.

ELEVATION: Previously found at approximately 1,158 m (3,800 ft) elevation at San Bernardino Ranch, Cochise County. Currently on the San Bernardino National Wildlife Refuge at 3,750 ft. Found in areas of Mexico from 800 to 1,700 m [2,625 to 5,580 ft.] (Francisco Abarca, pers. comm.).

PLANT COMMUNITY: Riparian plant community.

POPULATION TRENDS: In Arizona, previously found only in San Bernardino Creek, Cochise County. Extirpated from the United States by 1970. Population reintroduced into San Bernardino National Wildlife Refuge in 1990 and still in existence in 1994. Hendrickson et al.

(1980) describe *C. formosa* as "relatively scarce throughout its wide range in the Rio Yaqui area."

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: LT with critical habitat (USDI, FWS 1984)
STATE STATUS: 1A (AGFD SWAP 2012)
 [WC, AGFD, WSCA in prep].
 [Subspecies listed State Endangered AGFD, TNW 1988]

OTHER STATUS: No Forest Service Status (USDA, FS Region 3 1999)
 [Forest Service Sensitive, USDA, FS Region 3 1988]
 A, Determined Threatened in Mexico (NORMA Oficial Mexicana NOM-059-SEMARNAT-2010).
 Listed Threatened (Secretaría de Medio Ambiente 2000)
 [Listed Threatened, Secretaría de Desarrollo Social 1994]

MANAGEMENT FACTORS: Habitat renovation and preservation are of utmost importance. Water flow, water quality, presence of exotic fish and presence of introduced bullfrogs are all factors to be concerned with.

Threats: aquifer pumping; reduction in stream flows; water diversion; drought; and, predation by and competition with nonnative fishes. **Management needs:** protect San Bernardino aquifers, and Leslie Creek and San Bernardino Creek watersheds to ensure adequate perennial flow; identify priority management waters; ameliorate effects of nonnative fishes in management waters; re-establish self-sustaining populations in San Bernardino and Leslie Canyon NWR habitats; stabilize and protect populations in Mexico.

PROTECTIVE MEASURES TAKEN: Endangered Species Act. National Wildlife Refuge (San Bernardino Wildlife Refuge). Critical habitat includes all aquatic habitats of San Bernardino National Wildlife Refuge, Cochise County, Arizona. Over 700 fish were captured in Mexico and transported to Dexter National Fish Hatchery, New Mexico to establish a captive breeding program. Fishes were re-introduced into the San Bernardino National Wildlife Refuge in May of 1990.

SUGGESTED PROJECTS: Determine natural history characteristics necessary for successful re-introduction, such as habitat requirements, reproduction, food habitats, and survivorship. Determine potential sites for re-introduction; re-introduce populations.

LAND MANAGEMENT/OWNERSHIP: USFWS, San Bernardino National Wildlife Refuge. In Mexico, habitat includes private, public and ejido lands.

SOURCES OF FURTHER INFORMATION

REFERENCES:

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MAJOR KNOWLEDGEABLE INDIVIDUALS:

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ADDITIONAL INFORMATION:

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