

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

Animal Abstract

Element Code: AFCNC05022

Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Poeciliopsis occidentalis sonoriensis*
COMMON NAME: Yaqui topminnow
SYNONYMS: *Girardinus sonoriensis*, *Poeciliopsis sonoriensis*
FAMILY: Poeciliidae

AUTHOR, PLACE OF PUBLICATION: C. Girard, Philadelphia. 1859.

TYPE LOCALITY: Rio San Bernadino, Sonora.

TYPE SPECIMEN: Unknown

TAXONOMIC UNIQUENESS: Two species in the genus in North America. One species occurs in Arizona which has two subspecies, *P. o. occidentalis* and *P. o. sonoriensis*.

DESCRIPTION: “Dorsal profile slightly curved, body somewhat elongated. Caudal fin rounded to almost square. Gonopodium of male elongated, reaching past snout when in copulatory position. Males small, rarely more than 2.5 mm (0.98 in.) standard length; females larger, sometimes 5.0 mm (1.97 in.) or more, usually 3.0 to 4.5 mm (1.18 to 1.77 in.), standard length” (Minckley 1973).

“Body tan to olivaceous, darker above, yellowish to whitened below, but generally lacking dark spots on venter. Scales on dorsum outlined, often diffusely; lateral band developed posterior to pelvic-fin insertions, obsolete anteriorly (or diffuse). Breeding males blackened as in *P. o. occidentalis*, somewhat less intense. Females lacking a darkened peritroct” (Minckley 1973).

AIDS TO IDENTIFICATION: Female topminnow may be distinguished from mosquitofish (*Gambusia affinis*) by lack of dark spots on caudal fin and lack of dark sub-orbital teardrop-shaped mark; origin of dorsal and anal fin vertically inline, perpendicular to horizontal axis of fish, in mosquitofish origin of dorsal fin posterior to origin of anal fin. Male topminnows in breeding condition may or may not become dark black, male mosquitofish never do; male topminnows gonopodium, when extended forward in copulatory position, extends very near to or past the snout, male mosquitofish does not. Topminnows have weak, spatulate teeth whereas mosquitofish have strong conically shaped teeth, distinguishable only with a microscope. Female topminnows are generally larger than males.

P. o. sonoriensis, can be distinguished from *P. o. occidentalis* by a superior mouth, longer

snout, and the lateral bands of the female, which rarely develop before the bases of the pelvic fins (Minckley 1973).

ILLUSTRATIONS: B&W photo (Minckley 1973:202)

TOTAL RANGE: Limited to the Rio Yaqui basin.

RANGE WITHIN ARIZONA: Limited to the portion of the Rio Yaqui basin in the San Bernardino Wildlife Refuge, Arizona.

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: The topminnow is able to adjust to wide variations in water quality, and appears to be adapted to withstand periodic flash flooding (Galat 1988). Topminnows can withstand water temperatures from near freezing to 32.2-37.7° C (90-100° F). Long breeding seasons and high fecundity rates have allowed topminnows, to rapidly expand their population when habitat is available. Topminnows typically live about one year or a successful breeding season. Actual lifespan is determined by the age at which they reach sexual maturity, which may only be a few weeks.

REPRODUCTION: The Yaqui topminnow is a livebearer whose breeding season may last from January through August. Males become dark black and aggressively defend individual territories, which females enter when ready to spawn. The male places spermatophores into the female by means of gonopodia. Less dominant males who are unable to defend a territory successfully may attempt inconspicuous breeding by using an extra long gonopodium.

Brood size can vary from 6 to 49 young and gestation lasts 12 to 15 days (Minckley 1973). Females often carry two broods at the same time, each brood at a different stage of development (Minckley 1973). Rinne and Minckley (1991) point out that the female has the ability to store sperm, allowing her to fertilize eggs for the duration of her short life from a single copulation.

FOOD HABITS: Omnivorous; detritus, algae, and aquatic invertebrates. Food choice is usually dependent upon a combination of food availability and the topminnow's size.

HABITAT: Lowland and some upland streams of desert and grasslands, and margins of large, lowland rivers. A typical inhabitant of vegetated springs, brooks, and margins, and backwaters of larger bodies of water (Minckley 1973). "...topminnows live near the surface in shallow water and are often associated with aquatic vegetation or other cover" (Rinne and Minckley 1991).

ELEVATION: Below 1,500 m (4,920 ft.). According to W. Minckley (AGFD Native Fish Diversity Review 1995), they do not go above 1,300 m (4,265 ft.). Based on records in the

Heritage Data Management System (HDMS), elevation ranges from 1138 – 1409 m (3,730-4,620 ft) (AGFD, unpublished data accessed 2001).

PLANT COMMUNITY: Cottonwood/willow or burrobrush/seep willow terrestrial riparian communities, in association with aquatic plants such as green algae, *Nasturtium*, *Chara*, and *Potamogeton* spp.

POPULATION TRENDS: The Yaqui topminnow is currently limited to waterways of the San Bernardino National Wildlife Refuge. Loss of habitat and the exotic mosquitofish (*Gambusia affinis*), are thought to be the main threats posed against this subspecies.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: LE (USDI, FWS 1967)
STATE STATUS: 1A (AGFD SWAP 2012)
 [WSC,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]
 A, Determined Threatened in Mexico
 (NORMA Oficial Mexicana NOM-059-SEMARNAT-2010)
 [Full Species Listed Threatened, Secretaría de Medio Ambiente 2000]
 [Full Species Listed Threatened, Secretaría de Desarrollo Social 1994]

MANAGEMENT FACTORS: Water development and diversion, aquifer pumping, reduction in stream flows, drought, introduction of exotic species, and erosion from overgrazing are serious threats to the survival of the Yaqui topminnow. Mosquitofish have caused the elimination of three introduced Yaqui topminnow sites (Bagley et al. 1991). 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 (AGFD 1996 in prep).

PROTECTIVE MEASURES TAKEN: The Nature Conservancy purchased the San Bernardino Ranch in 1980. The land was then sold to the U.S. Fish and Wildlife Service and the area was established as a national wildlife refuge. In 1984, the Sonoran Topminnow Recovery Plan was drafted.

SUGGESTED PROJECTS: As identified in the Recovery Plan (1983): “1. Maintain, protect, and enhance existing populations and their habitats. 2. Continue surveying waters in the Gila River drainage and the United States portion of the Yaqui River drainage for undiscovered populations of topminnow. 3. Maintain stocks of both Gila and Yaqui topminnow at Dexter National Fish Hatchery. 4. Reintroduce Gila and Yaqui topminnow into suitable sites within the United States portion of their historic ranges. 5. Initiate and support further studies of the Gila and Yaqui topminnow. 6. Enforce all State and Federal laws protecting topminnow populations and their habitat. 7. Develop public support through an information and education program.” Work with Mexican authorities to regulate groundwater removal from the San Bernardino valley aquifer.

LAND MANAGEMENT/OWNERSHIP: U.S. Fish and Wildlife Service - San Bernardino National Wildlife Refuge; Johnson Historical Museum; Private.

SOURCES OF FURTHER INFORMATION

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ADDITIONAL INFORMATION:

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