Scientific Name: *Poecilliopsis occendentalis sonorensis*
Common Name: Yaqui topminnow
BISON No.: 010567

Legal Status:

- Arizona, Species of Special Concern
- ESA, Endangered
- ESA, Proposed Endangered
- ESA, Proposed Threatened
- ESA, Threatened
- New Mexico-WCA, Endangered
- New Mexico-WCA, Threatened
- USFS-Region 3, Sensitive
- None

Distribution:

- Endemic to Arizona
- Endemic to Arizona and New Mexico
- Endemic to New Mexico
- Not Restricted to Arizona or New Mexico
- Northern Limit of Range
- Southern Limit of Range
- Western Limit of Range
- Eastern Limit of Range
- Very Local

Major River Drainages:

- Dry Cimmaron River
- Canadian River
- Southern High Plains
- Pecos River
- Estancia Basin
- Tularosa Basin
- Salt Basin
- Rio Grande
- Rio Mimbres
- Zuni River
- Gila River
- Rio Yaqui Basin
- Wilcox Playa
- Rio Magdalena Basin
- Rio Sonoita Basin
- Little Colorado River
- Mainstream Colorado River
- Virgin River Basin
- Hualapai Lake
- Bill Williams Basin

Status/Trends/Threats (narrative):

Federal: Endangered, State AZ: Wildlife of concern.
The endangered Sonora topminnow *Poecilliopsis occidentalis sonorensis* has steadily declined in distribution and abundance in the past several decades (Meffe et al 1983).
A major threat to recruitment of larval Yaqui topminnow is cannibalism of their offspring and offspring of other females plus small males (McNatt 1974). Mosquitofish have extirpated topminnows throughout most of Arizona, largely by predation on juveniles (Minckley 1973). As mosquitofish colonized a pool, populations of topminnows declined as a result of predation by the introduction fish (Meffe 1984). Meffe (1984) predicted that the introduced of the western mosquitofish populations would incur greater losses during Southwestern floods than native Yaqui topminnow. This was supported by preflood and postflood population surveys in a natural habitat and by subsequent laboratory simulations of floods (Meffe 1984). Mosquitofish typically

extirpate topminnows from native habitats via predation within 1-3 yr after introduction (Meffe 1984). Another threat to Yaqui topminnow is that most low desert streams are now diverted by dams in their headwaters, or have their subterranean supplies interdicted by well fields that pump them dry (Minckley 1991). The reduction is primarily attributed to, habitat destruction, and introduced and establishment of the western mosquitofish and other exotic fishes (Meffe et al 1983).

Distribution (narrative)**:**

The Yaqui topminnow is native to the Sonoran Desert of the southwestern US and northwestern Mexico (Meffe et al 1983). Yaqui topminnows are found in both the Colorado and Yaqui basins near 1500 m to sea level, although high-altitude occurrences are most commonly associated with outflows of springs (Minckley 1991). In the Rio Yaqui basin, the Yaqui topminnow/*charalito* similarly lives in upper parts of the system (Minckley 1991). The Yaqui topminnow formerly occupied lowland streams in the Gila River system of Arizona and New Mexico (Meffe et al 1983). The Yaqui topminnow formerly occurred from Frisco Hot Spring; New Mexico, to near the mouth of the Gila River (Minckley 1991). Currently the Yaqui topminnow survives in the US only in several isolated localities in southern AZ (Meffe et al 1983). The Yaqui topminnow is restricted to the basin of the Rio Yaqui in Arizona, and persists in small artesian-fed waters on the San Bernardino Ranch, east of Douglas, Cochise Country (Minckley 1973). Until recently the Yaqui topminnow enjoyed almost as wide a distribution as did the local form of *Agosia* (McNatt 1974). The Yaqui topminnow was present in Whitewater Draw, in San Bernardino Creek, and in numerous artesian fed waters of the San Bernardino Ranch (McNatt 1974). At present it occurs in small populations in one natural spring on the San Bernardino Ranch, Arizona and in three, relatively small artesian bores (McNatt 1974). The Yaqui topminnow is currently widespread and abundant throughout its range in Mexico (Hendrickson et al 1981).

Key Distribution/Abundance/Management Areas:

Panel key distribution/abundance/management areas:

Breeding (narrative)**:**

Topminnows reproduce year around in the constant temperatures of springs, but have strong spring-summer reproductive cycles in habitats with seasonally variable temperatures (Minckley 1991). There is little or no reproduction occurs in winter months (McNatt 1974). Topminnows practice internal fertilization and development of young (Minckley 1991). Sperm packets (spermaophores) are delivered to the female's genital opening by use of a highly modified anal fin of the male, and the female can store sperm, so a single sex act can serve to fertilize eggs throughout her life (Minckley 1991). Young develop within the female's ovaries, and can swim, feed, and avoid predators a few seconds after birth (Minckley 1991). Number of the young per brood, ranges from 6 to 49 in April and May, and the period of gestation is 12 to 15 days

(Minckley 1973). Sexual maturation is rapid, sometimes less than six weeks after birth in warm water in summer (Minckley 1991).

Habitat (narrative)**:**

Yaqui topminnows persist in small artesian-fed waters (Minckley 1973). Yaqui topminnows live near the surface in the shallow water, and are often associated with outflows of springs and aquatic vegetation or other cover (Minckley 1991).

Breeding Season:

- January
- February
- March
- April
- May
- June
- July
- August
- September
- October
- November
- December

Panel breeding season comments:

Aquatic Habitats:

Large Scale:

- Rivers
- Streams
- Springs
- Spring runs
- Lakes
- Ponds
- Sinkholes
- Cienegas
- Unknown
- Variable

Small Scale:

- Runs
- Riffles
- Pools
- Open Water
- Shorelines

Panel comments on aquatic habitats:

Important Habitat Features (Water characteristics):

Current
- Fast (> 75 cm/sec)
- Intermediate (10-75 cm/sec)
- Slow (< 10 cm/sec)
- None
- Unknown
- Variable

Gradient
- High gradient (>1%)
- Intermediate Gradient (0.25-1%)
- Low Gradient (<0.25%)
- None
- Unknown
- Variable

Water Depth
- Very Deep (> 1 m)
- Deep (0.25-1 m)
- Intermediate (0.1-0.25 m)
- Shallow (< 0.1 m)
- Unknown
- Variable

Panel comments on water characteristics:

Important Habitat Features (Water Chemistry)

Temperature (general)
- Cold Water (4-15°C)
- Cool Water (10-21°C)
- Warm Water (15-27°C)
- Unknown
- Variable

Turbidity
- High
- Intermediate
- Low
- Unknown
- Variable

Conductivity
- Very High (> 2000 µS/cm)
- High (750-2000 µS/cm)
- Intermediate (250-750 µS/cm)
- Low (< 250 µS/cm)
- Unknown
- Variable

Panel comments on water chemistry:

Important Habitat Features (Structural elements):

Substrate
- Bedrock
- Silt/Clay
- Detritus
- Sand
- Gravel
- Cobble
- Boulders
- Unknown
- Variable

Cover
- Rocks, boulders
- Undercut banks
- Woody debris
- Aquatic vegetation
- Rootwads
- Not important
- Overhanging vegetation
- Unknown
- Variable

Panel comments on structural elements:

Diet (narrative)**:**
Yaqui topminnows feed on small invertebrates such as mosquito larvae, microscopic plants, and sometimes detrital materials (Minckley 1991).

Diet category (list):
- Planktivore
- Herbivore
- Insectivore
- Piscivore (Fish)
- Omnivore
- Detritivore

Grazing Effects (narrative):
The Yaqui ichthyofauna within the United States has suffered three extinctions and may be attributed directly to modifications in habitat and/or drought and perhaps over-use of water supplies by domestic livestock (McNatt 1974).

Panel limiting habitat component relative to grazing and comments:
Panel assessment: Is this species a priority for selecting a grazing strategy? Throughout the species' distribution in New Mexico and Arizona YES NO UNKNOWN In key management area(s) YES NO UNKNOWN

Principle Mechanisms Through Which Grazing Impacts This Species (list):
May be Revised

- Alteration of bank structures
- Alteration of substrate
- Alteration of water regimes
- Altered stream channel characteristics
- Altered aquatic vegetation composition
- Altered bank vegetation structure
- Change in food availability
- Change in water temperature
- Change in water quality
- Habitat fragmentation
- Increased turbidity
- Other biotic factors
- Parasites or pathogens
- Population genetic structure loss
- Range improvements
- Trampling, scratching
- Unknown

Panel causal mechanisms comments:

Authors

- **Draft:** Magaña, H.A.
- **GP 2001:**
- **GP 2002:**
- **Revision:**

Bibliography:

McNatt, R. M. 1974. Re-evaluation of the native fishes of the Rio Yaqui in the U.S., Proceedings of the 54th annual conference of Western Association of State Game and Fish Commissioners, Albuquerque, NM. July 16-19, 1974. pp 273-279.

Meffe, G.K. 1984. Effects of abiotic disturbance on coexistence of predator-prey fish species. Ecology 65 (5):1525-1534.

Meffe, G.K, Hendrickson, D.A., Minckley, W.L., and Rinne, J.N. 1983. Factors resulting in decline of the endangered Sonora topminnow *Poecilliopsis* (Antherformes: Poecilliidae) in the United States. Biological Conservation 25: 135-159.

Minckley, W. L. 1973. Fishes of Arizona. Arizona Game and Fish Department. Phoenix, Arizona. 293 pp.

Minckley, W.L. 1991. Native fishes of arid lands: A dwindling resource of the desert southwest. USDA Forest Service. General Technical Report RM-GTR-206. pp 18.