

Scientific Name: *Gambusia nobilis*

Common Name: Pecos gambusia

BISON No.: 010225

Legal Status:

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

Distribution:

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

Major River Drainages:

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

Status/Trends/Threats (narrative):

Federal (USDI): Endangered, State NM: Endangered.

The populations are endangered, but stable in New Mexico.

In New Mexico it is presently limited to seven isolated locations at Bitter Lake National Refuge (Chaves County) and one population at Blue Spring (Bednarz 1979, Lee et al 1981). The historic range of Pecos gambusia was limited mainly to spring complexes on Bitter Lake National Wildlife Refuge, Blue Spring, Toyah Creek drainage, Leon Creek drainage, and Comanche Springs (Propst 1999), but, groundwater pumping dried Comanche Springs and thus extirpated this population by the 1950s (Echelle and Echelle, 1980).

The greatest threat to the Pecos gambusia is hybridization and competition with the western mosquitofish (Bednarz 1979, Echelle and Echelle 1980, Lee et al. 1981), however, structural differences in female genitalia, keeping hybridization at a low rate (Bednarz 1979). The

apparent reproductive capacity and smaller size at maturity for males, the western mosquitofish appears capable of expanding its population more rapidly than the Pecos gambusia (Bednarz 1979). Pecos gambusia appears to co-exist well with all species of fish found in the same habitat except other gambusia (Bednarz 1979). Echelle and Echelle (1980) attributed the absence of Pecos gambusia from Lake St. Francis on that refuge to the presence of green sunfish. Hubbs and Echelle (1972, Lee et al. 1981) identified groundwater pumping as the greatest threat to extant populations of Pecos gambusia.

Distribution (narrative):

The historic range of Pecos gambusia was limited mainly to spring complexes on Bitter Lake National Wildlife Refuge, Blue Spring, Toyah Creek drainage, Leon Creek drainage, and Comanche Springs (Propst 1999). Historically, the Pecos gambusia occurred as far north as the Pecos River near Fort Sumner (Sublette et al 1990). The Pecos gambusia is endemic to springs and spring systems of the Pecos River basin of southeastern New Mexico and western Texas (Hubbs and Springer, 1957, Echelle et al.1989). The Pecos gambusia is also found in springs and gypsum sinkholes on Bitter Lake National Wildlife Refuge (near Roswell) and Blue Spring and its outflow (near Whites City) apparently are the only areas of regular occurrence of Pecos gambusia in New Mexico (Bednarz, 1979). The Pecos gambusia once occurred throughout the Pecos River drainage in southwestern Texas and southeastern New Mexico (Hubbs and Springer 1957, Hubbs and Echelle 1972, Bednarz 1979). Distribution in New Mexico is currently limited to the Bitter Lake National Wildlife Refuge and Blue Springs (Lee et al. 1981). Its range is restricted to sinkholes or springs and their outflow on the west side of the Pecos River in Chaves and Eddy countries (Bednarz 1979).

Key Distribution/Abundance/Management Areas:

Panel key distribution/abundance/management areas:

Breeding (narrative):

There is little information on the breeding behavior of Pecos gambusia, but they may spawn several times a year. Pecos gambusia produce live young (Propst 1999).

Habitat (narrative):

Natural cover used by the Pecos gambusia consisted of aquatic vegetation overhanging banks and submerged cliffs (Bednarz 1979). Any shallow area with aquatic vegetation seems suitable habitat if other factors are within the range of tolerance (Bednarz 1979). Bednarz (1979) reported the largest populations of Pecos gambusia were found near spring flows and seepages, while the western mosquitofish were found in temporary ponds and waters with unstable conditions. Typically Pecos gambusia inhabit shallow margins of clear vegetated spring waters high in calcium carbonate (Lee et al. 1981, Sublette et al. 1990). Bednarz (1979) reported Pecos gambusia most common near the springhead in habitats having zero-velocity water. Pecos

gambusia tended to occupy mainly still-water and low-velocity habitats in the presence of western mosquitofish (Propst 1999). Hubbs et al. (1995) found that Pecos gambusia occupied vegetated habitats and avoided open water in areas that also had largespring gambusia (*Gambusia geiseri*).

Key Habitat Components: stenothermal, high conductivity springs and spring runs.

Breeding Season:

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

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 $\mu\text{S}/\text{cm}$)
- High (750-2000 $\mu\text{S}/\text{cm}$)
- Intermediate (250-750 $\mu\text{S}/\text{cm}$)
- Low (< 250 $\mu\text{S}/\text{cm}$)
- 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):

The Pecos gambusia is a carnivorous surface feeder consuming any insect settling on the water surface (Bednarz 1979). Although the Pecos gambusia feeds all day, the primary time of feeding correlates with insect activity at night (Bednarz 1979). The Pecos gambusia will prey on any type of surface and mid-water insects of adequate size especially Culicidae and Corixidae. (Bednarz 1979).

Diet category (list):

- Planktivore
- Herbivore
- Insectivore
- Piscivore (Fish)
- Omnivore
- Detritivore

Grazing Effects (narrative):

There is no specific information with respect to cattle grazing and the Pecos gambusia, however, grazing could have an impact on spring habitats occupied by the species.

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*****

- | | | |
|---|---|--|
| <ul style="list-style-type: none"> ➤ Alteration of bank structures ➤ Alteration of substrate ➤ Alteration of water regimes ➤ Altered stream channel characteristics ➤ Altered aquatic vegetation composition | <ul style="list-style-type: none"> ➤ Altered bank vegetation structure ➤ Change in food availability ➤ Change in water temperature ➤ Change in water quality ➤ Habitat fragmentation | <ul style="list-style-type: none"> ➤ 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. and Rinne, J.N.
- **GP 2001:**
- **GP 2002:**
- **Revision:**

Bibliography:

Bednarz, J.C. 1979. Ecology and Status of the Pecos Gambusia, *Gambusia Nobilis* (Poeciliidae), in New Mexico (Pecos Gambusia). The Southwestern Naturalist 24 (2):311-322.

Lee, D. S., Gilbert C. R., Hocutt C. H., Jenkins R. E., Callister D. E., and Stauffer J. R. 1981. Atlas of North American Freshwater Fishes: North Carolina, North Carolina State Museum of Natural History, 1981, c1980.

Propst, D. L. 1999. Threatened and endangered fishes of New Mexico. New Mexico Game and Fish Tech Report 1. 84 pp.

Sublette, J. E., M. D. Hatch, and M. Sublette. 1990. The Fishes of New Mexico. University of New Mexico Press. Albuquerque. 393 pp.