

Scientific Name: *Cyprinella formosa formosa/mearnsi*

Common Name: Beautiful Shiner

BISON No.: 010405

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: Threatened, USFS Region 3 (AZ, NM): Sensitive, State AZ: Special concern, State NM: Extirpated.

Habitat degradation and destruction caused by water diversion, overgrazing and subsequent erosion, aquifer pumping and introduction of exotic fishes, has resulted in extirpation (Abarca et.al. 1995). Extensive pumping of the San Bernadino Creek valley has destroyed a considerable amount of surface water and hence indigenous fish fauna (McNatt 1974). One cause of concern is that the beautiful shiner occupies streams that are subject to desiccation and environmental extremes (Lee 1981). Now extirpated in New Mexico, its demise is probably a result of ephemeral stream flows, especially downstream from Dwyer, resulting from drought conditions and diversion of water from the river for agricultural purposes (Sublette et. al. 1990).

Distribution (narrative):

The beautiful shiner is found in southern Arizona and New Mexico and in northern Mexico. The beautiful shiner was first reported in the Mimbres River, near Deming, NM (1857), (Lee 1981). It was first described from specimens collected in 1893 by Dr. Edgar A. Mearns, chief of the biological section of the U.S. and Mexican Boundary Survey, from San Bernadino Creek (Minckley 1973). "The beautiful shiner persisted on the San Bernadino ranch, east of Douglas, AZ, until at least 1968, when last taken in numbers, but only two very young fish were found in 1969-1970, since much of the waters of that area have been destroyed or radically modified" (McNatt 1974). The present distribution in the U.S. is reported from southern AZ and NM (Lee 1981). The beautiful shiner is found in Rio Bavispe Cochise county, AZ and Hidalgo county, NM, and currently stocked into Twin Pond on San Bernadino/Leslie Canyon National Wildlife Refuge, and occupies Oasis and Mesquite ponds within same refuge (Abarca et.al. 1995).

Key Distribution/Abundance/Management Areas:

Panel key distribution/abundance/management areas:

Breeding (narrative):

Spawning for the beautiful shiner consists of spreading the eggs over aquatic vegetation, brush, or other cover, or simply over the substrate (Minckley 1991).

Habitat (narrative):

The beautiful shiner was originally found in San Bernadino Creek, a tributary of the Yaqui River (Miller and Simon 1943). The headwater region of this stream is about 17 miles east of Douglas, AZ. The beautiful shiner occupied a small pool immediately below the spring, which according to local testimony, is the highest permanent water in the creek (Miller and Simon 1943). "On the date of collection the water was muddy over a bottom of gravel, sand, and boulders, the max depth was 5 feet, and vegetation was absent" (Miller and Simon 1943). The beautiful shiner occupies streams that are subject to desiccation and environmental extremes (Lee 1981). The beautiful shiner lives in midwater habitats of pools and runs, along shorelines in large streams, and tending to move onto riffles in smaller streams. It is found in intermediate to lower elevations in springs, cienegas, and moderate sized rivers and creeks. Only smaller streams and intermittent pools of creeks that have a high percentage of riffle habitats in wetter periods and occasionally in some ponds at lower elevations, the species was found to be abundant (Abarca et.al. 1995).

Seasonal Activity:

Males in breeding condition have yellow-orange or orange on the caudal and lower fins; dorsal fin darkened, with little if any, milky-white pigment evident (Minckley 1973).

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

Beautiful shiners feed on drifting aquatic and terrestrial invertebrates (Minckley 1991).

Diet category (list):

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

Grazing Effects (narrative):

The pool where the beautiful shiner was first found was used extensively as a water hole for cattle and was considerably fouled, and “on the date of collection the water was muddy over a bottom of gravel, sand, and boulders, the maximum depth was 5 feet, and vegetation was absent” (Miller and Simon 1943). Overgrazing and subsequent erosion has resulted in extirpation of the beautiful shiner from its historical habitat (Abarca et.al. 1995).

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

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

May be Revised

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

Panel causal mechanisms comments:
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Authors

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

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