

Scientific Name: *Pimephales promelas*

Common Name: Fathead Minnow

BISON No.: 010285

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):

The fathead minnow is not threatened or endangered.

Distribution (narrative):

The fathead minnow is nowhere common in AZ, but seems quite widespread, and even been taken in quieter parts of the Colorado River in the Grand Canyon (Minckley 1973). The fathead minnow is native to central NA, NE US and NE Mexico. It has been introduced throughout much of North America as a bait minnow. The fathead minnow is found in the Arkansas and Pecos drainage of eastern New Mexico, it may be the only fish present in these intermittent pools. In New Mexico it is native to the Mimbres, Rio Grande, Pecos, and Canadian drainages. It was introduced into the San Juan and Gila drainages by at least the 1950's, and into the Zuni

and San Francisco drainages by the 1960's. The status of populations is established in the San Juan, San Francisco, and Gila drainages; localized in the Zuni drainage; diminishing in the Mimbres drainage; and stable in the Rio Grande, Pecos, Canadian, and Dry Cimarron drainages (Sublette et. al. 1990).

Key Distribution/Abundance/Management Areas:

Panel key distribution/abundance/management areas:

Breeding (narrative):

Nesting habits of the fathead minnow involve the eggs being attached to an object that is situated somewhere above bottom, and typically to its underside, and attended by the male until hatching. The clutch of eggs is fanned by the male. Young hatch in a few days, and those appearing early in the year may mature and spawn before autumn (Markus 1935). Most individuals mature during the second year and the species has a prolonged spawning period. Eggs are laid on underside of floating or suspended objects in quiet water. Males guard the nest (Lee et. al. 1981). In New Mexico, spawning occurs in the spring and summer (Koster 1957) in warm temperatures between 15.6-18.4 C. Temperatures exceeding 29 C are reported to halt reproduction (Becker 1983). At the onset of breeding season, the male abandons the schooling habit and exhibits territoriality and will spawn with several females, usually at night; he remains with the nest which is located on the underside of solid objects until the cluster of eggs are hatched. During incubation, the water surrounding the eggs is agitated by the male to assure oxygenation and keep the nest sediment-free (Sublette et. al. 1990). Spawning occurs several to many times during a season, with about 85 percent of the adults dying after spawning (Markus 1934). Eggs are demersal and adhesive, with a diameter of 1.0-1.6 mm. At water temps of between 23-30 C, incubation time is approx five days with the number of eggs per nest ranging from 36-1200 (Markus 1934).

Habitat (narrative):

In much of North America the fathead minnow is found from Chihuahua, Mexico north to Great Slave Lake drainage. In nature the fathead minnow appears to prefer quiet, muddy streams, being one of the last species to expire in small pools of intermittent streams during drought, and one of the first to invade typically dry streams when rains occur (Cross 1967). The fathead minnow is found in a wide variety of habitats in rivers, streams, lakes, and ponds, particularly in waters with abundant floating and submerged vegetation. It has a high tolerance for turbid waters with low oxygen and high temperatures and water velocities less than 15 cm/sec are preferred (Andrews 1970).

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 $\mu\text{S}/\text{cm}$)
- 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):

Fathead minnows feed upon microscopic materials, primarily detritus and algae that occur on the soft bottoms of pools in which they live (Minckley 1973). Main foodstuff of fathead minnows is algae, but they also eat aquatic insect larvae (Lee et al. 1981). Fathead minnows feed in soft bottom mud, taking a variety of items from algae and plant fragments to insect larvae and microscopic crustaceans, depending on the food available (Sublette et al. 1990).

Diet category (list):

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

Grazing Effects (narrative):

Since fathead minnows prefer quiet muddy streams, cattle grazing may not affect the species. Given that the fathead minnow is usually the last species to expire in small pools of intermittent streams is can be impacted by cattle and large mammals that use these pools for watering.

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

Bibliography:

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