Scientific Name: *Cyprinodon macularius eremus*
Common Name: Quitobaquito pupfish
BISON No.: 000000

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 USDI: Threatened. State AZ: Threatened.
Range is greatly reduced and the last remaining population in Quitobaquito Springs (Miller and Fuiman 1987, Daerr 2001). The population of Quitobaquito pupfish at Quitobaquito is apparently stable and ranges from 3000 to 8,000 individuals seasonally (Miller and Fuiman 1987) however Daerr (2001) estimated 4,000-5,000 Quitobaquito pupfish live in their namesake pond.
The Quitobaquito complex lies directly on the US/Mexico border and is less than 100 m from Mexican Highway 2, a heavily traveled highway linking Baja California and mainland Mexico (Conner 1995, Daerr 2001). Habitat alteration, predation and competition with nonnative fishes, and possibly wind-drift of pesticides from Sonora, Mexico threaten the Quitobaquito pupfish (Miller and Fuiman 1987, Petsforum 2002). The area immediately south of the border is

agricultural, with associated water pumping and aerial pesticide spraying (Conner 1995). Predation by large aquatic insects, piscivorous birds, and occasional mammals are sources of population attrition (Minckley 1973).

Distribution (narrative)**:**

The sole habitat for the Quitobaquito pupfish are the springs, pond, and connecting 700 ft. channel at Quitobaquito, in the southwestern corner of Organ Pipe Cactus National Monument, Arizona (Minckley 1973, Miller and Fuiman 1987, Conner 1995) and some are held by Arizona Game and Fish Dept. and at ASU (Minckley 1973).

Key Distribution/Abundance/Management Areas:

Panel key distribution/abundance/management areas:

Breeding (narrative)**:**

Spawning occurs in spring and early summer (Minckley 1973). In warm, shallow habitats, where food is abundant, sexual maturity may be attained in six weeks (Minckley 1973). The eggs are deposited randomly within the territory of a given male (Minckley 1973, Miller and Fuiman 1987). The eggs hatch in a few days (Minckley 1973). Minckley (1973) reported that there is no direct parental care, however the territorial behavior of the male may serve that purpose. The Quitobaquito pupfish has a maximum lifespan of three years (Petsforum 2002).

Habitat (narrative)**:**

The Quitobaquito pupfish is now restricted to small ponds, springs, and an adjacent refugia pond of Quitobaquito Springs, in Organ Pipe Cactus National Monument AZ; it formerly occurred in a range of habitats similar to those of *C. macularius* (Miller and Fuiman 1987, Petsforum 2002). The Quitobaquito pupfish at Quitobaquito is found in a large pool where it prefers shallow water (Miller and Fuiman 1987). In the winter, the Quitobaquito pupfish spends a dormant period buried in loose material in the pond (Petsforum 2002). The Quitobaquito pupfish tolerates a wide range of water temperatures (Miller and Fuiman 1987).

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)**:**

The Quitobaquito pupfish is omnivorous feeding on aquatic insects, crustaceans, and plants (Miller and Fuiman 1987). Within a few hours to a day after hatching the young Quitobaquito pupfish starts feeding on small animals, plants, and on bottom debris (Minckley 1973). As the Quitobaquito pupfish grows larger they feed on larger animals, such as mosquito larvae, and also bite off and eat bits of larger aquatic plants (Minckley 1973). The Quitobaquito pupfish prefers detritus on the bottom of the pond (Cox 1972). The female Quitobaquito pupfish will usually graze slowly as it moves around the pond whereas the male Quitobaquito pupfish, while in it's territory, will rapidly grab a piece of debris from the bottom, swallow some, and then return to patrolling (Cox 1972). The Quitobaquito pupfish is not cannibalistic, however, it will eat its own eggs (Cox 1972). There is one report of cannibalism when A.L. Gardener observed a large *C. macularius* eating a small juvenile on 8/7/64 at Quitobaquito Spring (Cox 1972). The Quitobaquito pupfish also actively excavates pits in softer bottoms, apparently in search of food organisms (Minckley 1973). Pit excavation and defense are fairly simple and food oriented (Minckley and Arnold 1969).

Diet category (list):

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

Grazing Effects (narrative):

There is no specific information regarding livestock grazing and the Quitobaquito pupfish, but since the Quitobaquito pupfish inhabits a single brackish spring in Organ Pipe Cactus National Monument it is doubtful that cattle grazing will be allowed in this sensitive area.

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:**

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