Scientific Name: *Gila intermedia*
Common Name: Gila chub
BISON No.: 010135

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: Wildlife of concern (Threatened), State NM: Endangered. Gila chub were rediscovered in two cienegas (tributaries to the San Pedro River) in Sonora, Mexico (Varela-Romero et al. 1992). In Arizona, Gila chub persist in small headwater streams tributary to the San Pedro, Santa Clara, San Francisco, Gila, Verde, and Agua Fria rivers (Propst 1999). Most populations there are considered unstable (Weedman et al. 1996). Changes in aquatic habitats in southern Arizona in the past century have had adverse effects on this species, and it is absent from many localities of former occurrence (Rinne and Minckley 1970).

A variety of factors probably contributed to the decline of Gila chub, but loss of cienega habitats by dewatering and channelization were probably the most serious threat. In addition, introduction of nonnative, competitive and predatory species, especially green sunfish has negatively impacted the Gila chub. Another threat to larger Gila chubs is that they are often taken by anglers (Rinne

and Propst 1970, Propst 1999). Groundwater pumping for municipal and irrigation uses, water diversions for irrigation, and damming of streams all contribute to drying of springs and reduction of stream flow are major threat to the species persistence.

Distribution (narrative)**:**

Gila chub historically occurred in suitable and rather specialized habitat throughout much of the Gila River drainage in southwestern New Mexico, central and southeastern Arizona, and northern Sonora (Minckley, 1973; Rinne, 1976; Bestgen and Propst, 1989; and Varela-Romero et al.1992). Restricted to the Gila River system of southern Arizona (Rinne and Minckley 1970).The Gila chub is distributed in central and southern Arizona, mostly in smaller creeks, cienegas, and in some artificial impoundments (Minckley 1973). The Gila chub is endemic to the Gila River basin, lower Colorado system (Minckley 1991).

Key Distribution/Abundance/Management Areas:

Panel key distribution/abundance/management areas:

Breeding (narrative)**:**

The biology of this species is poorly understood, but appears to last throughout the late winter, spring and summer months, perhaps into early autumn (Minckley, 1969). Reproduction by Gila chubs occurs in the spring (Rinne and Minckley 1970), however, Minckley (1973, 1991) reported that breeding seems to be sporadic throughout the spring and summer. Most chubs were not mature until their second or third year (Griffith and Tiersch, 1989). Optimal water temperature for spawning is apparently 20 to 24^{o}C (Propst 1999).

Habitat (narrative)**:**

Gila chub are characteristic of pools in small streams, marshes, and other quiet places (Minckley 1991). Gila chubs are highly secretive in nature, remaining in deeper waters or near cover (Minckley 1973). The secretive Gila chub mainly occupies pool habitats in small streams and cienegas but has been found in artificial impoundments in Arizona (Rinne and Minckley 1970, Weedman et al., 1996). Young Gila chubs are found in the shallowest water, among plants or debris; while juveniles move into currents for a time, then retreat to pools when large (Minckley 1973). In pools, individuals are most commonly associated with cover (e.g., vegetated undercut banks, boulders, and fallen logs) and inhabit the deeper portions of pools (Rinne and Minckley 1991).

Key habitat components: Deep pools, cover in form of undercut banks, root wads and in stream organic debris

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)**:**

Adult Gila chubs are crepuscular feeders (Griffith and Tiersch, 1989; Rinne and Minckley, 1991). All chubs are principally carnivorous as adults, feeding upon aquatic invertebrates and sometimes other fishes. Smaller individuals often feed on aquatic plants, usually algae (Rinne and Minckley 1970). Foods of the Gila chub include both large and small invertebrates principally of insects (aquatic and terrestrial), small fishes, filamentous algae, and organic debris (Minckley 1973, 1991). Young Gila chub are active throughout the day and feed on small invertebrates as well as aquatic vegetation (especially filamentous algae) and organic debris (Griffith and Tiersch, 1989; Rinne and Minckley, 1991). The occurrence of small gravel in gastrointestinal tracts suggests Gila chub may also be benthic feeders (Weedman et al., 1996).

Diet category (list):

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

Grazing Effects (narrative):

No studies of effects of grazing on the species is documented. Livestock grazing potentially could break down undercut banks, which could serve as cover and remove vegetation that could also serve as streambank cover or as larger, wood organic debris. Excessive grazing could conceivably increase fine sediment input and affect reproduction and food supply.

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. and Rinne, J.N.
- **GP 2001:**
- **GP 2002:**
- **Revision:**

Bibliography:

Griffith, J. S. and T. R. Tiersch. 1989. Ecology of fishes in Redfield Canyon, Arizona, with emphasis on *Gila robusta intermedia.* Southwest. Nat. 34: 131-134.

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.

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

Rinne, J.N. and Minckley, W.L. 1970. Native Arizona Fishes Part III "Chubs". Arizona Game and Fish Publication 17: 12-19.

Weedman, D. A., A. L. Girmendonk, and K. L. Young. 1996. Status review of Gila chub, *Gila intermedia,* in the United States and Mexico. Arizona Game and Fish Dept Tech. Rep. 91: 1-120.