Scientific Name: *Macrhybopsis aestivalis aestivalis*
Common Name: Speckled chub
BISON No.: 010151

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):

State NM: Provides limited protection.
Although the speckled chub has declined in abundance in its historical range it has not been listed as threatened or endangered. The Rio Grande of northern New Mexico historically supported at least 16 native freshwater fish species. Of these, the speckled chub is one of four cyprinids that have been extirpated (Plantania 1991). Sustained releases from Santa Rosa Reservoir rapidly transport semibouyant eggs and drifting larvae into Sumner Reservoir where eggs fall out of the water column and settle to the bottom and die (Plantania and Altenbach 1998). The synergistic effect of egg and larval fish transport and dam-related modifications of flow and habitat are probably responsible for the decline and demise of these taxa between Santa Rosa and Sumner Reservoirs. In the middle Rio Grande River, modification of historic hydrograph and fragmentation are believed to have contributed to the demise of the speckled

chub (Plantania and Altenbach 1998). Seining collections by Echelle et. al. (2002) between 1991 and 1993 resulted in capture of speckled chub in only 22 of 159 sites sampled, indicating a marked reduction in distribution. Analysis of duration curves by Echelle et al (2002) indicated that May-September river flows at most sampling sites were depressed from 1970 to 1988. Impoundments have fragmented once contiguous populations of the speckled chub to restricted reaches with suitable habitat, effectively eliminating movements between populations and colonization of vacant habitat (Echelle et. al. 2002).
Threats facing the speckled chub include; extensive agriculture activities and resultant demands for irrigation water, coupled with the construction of numerous reservoirs in the Arkansas River basin, have degraded and restricted habitats of the speckled chub and other fishes (Cross and Moss 1987).

Distribution (narrative)**:**

The speckled chub has been found in the Mississippi River basin from Ohio and West Virginia west to Minnesota and Nebraska, and south to Gulf Coast; Gulf Coast drainages from Choctawhatchee River in Alabama and Florida to Rio Grande in Texas and New Mexico, USA, and Mexico (Sublette et. al. 1990, Fishbase 2002). Historically the speckled chub occurred throughout the Arkansas River, including the main tributaries in Arkansas, Colorado, Kansas, New Mexico, Oklahoma, and Texas (Echelle et. al. 2002). The speckled chub is found from the Gulf of Mexico west of Apalachicola River drainage to the Rio Grande, and is limited north to the 45th parallel (Lee et. al. 1981). In New Mexico, the speckled chub historically limited to the South Canadian River from the confluence of Ute Creek downstream, and the lower reaches of Revuelto Creek (Propst 1999). The speckled chub is native to the Rio Grande downstream of San Ildefonso, the Pecos River downstream of Anton Chico, the Canadian River downstream of its confluence with Ute Creek. Presently the speckled chub is extirpated in the Rio Grande (Plantania and Altenbach 1998). Although extant in the Pecos and Canadian drainages, its distribution is more restricted, especially in its upstream limits, than historically (Sublette et. al. 1990).

Key Distribution/Abundance/Management Areas:

Panel key distribution/abundance/management areas:

Breeding (narrative)**:**

There is no information on reproductive biology of the speckled chub; however, it is believed to be similar to that of the Pecos River speckled chub, Rio Grande silvery minnow, and Plains minnow (Plantania and Altenbach 1998). Spawning begins in late spring or early summer when water temperatures rise above 21^{o} C and continues until fall (Sublette et. al. 1990). Eggs are broadcast and drift with the currents (Sublette et. al. 1990). Eggs are clear, nonadhesive, semibouyant, pelagic (**Coburn 1986**). Incubation time is about 24-48 h after fertilization (Bottrell et al 1964). Egg eating immediately after spawning by male and female individuals has been observed (Plantania and Altenbach 1998). Reproduction of speckled chub appears dependent on periodic and intensive river flows during spring and summer when buoyant eggs are deposited directly into the current and hatch in 2-4 days (**Moore 1944**).

Habitat (narrative)**:**

The speckled chub is usually found in large, low gradient streams usually over fine gravel or sand (Lee et. al. 1981). The speckled chub is one of the most characteristic small fishes inhabiting shallow rivers and streams with swift, turbulent, or laminar flows over sand or gravel bottoms, with high levels of turbidity and dissolved solids (**Cross and Moss 1987**, Fishbase 2002). The speckled chub is demersal and tends to aggregate near the foot of riffles (Sublette et. al. 1990). The speckled chub inhabits shallow, permanently flowing plains streams in areas where the bottom is clean sand or small gravel (**Miller and Robison 1973**). The speckled chub is found most frequently in moderate velocity habitats and apparently avoid low to zero velocity areas (**Cross and Collins 1975**).

Key habitat components: Shallow riffles with sand-gravel bottoms.

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 speckled chub is a bottom feeder, taking insect larvae, organic detritus, and plant material (Sublette et. al. 1990). Juvenile speckled chubs tend to be solitary, feeding aggressively from the bottom or on items falling toward the bottom; however, more mature individuals are secretive, seeking cover (Sublette et. al. 1990). Based upon observational studies the speckled chub forage above the stream bottom with their barbels in contact with the substrate. The speckled chub feeds primarily on aquatic insects associated with the sandy substrate (**Miller and Robison 1973**).

Diet category (list):
- Planktivore
- Herbivore
- Insectivore
- Piscivore (Fish)
- Omnivore
- Detritivore

Grazing Effects (narrative):
Based on the preference for highly turbid waters and sand substrates, grazing livestock nearby will probably have little effect on this small cyprinid, however, since the speckled chub inhabits shallow, low gradient streams it may be trampled by livestock.

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

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