Scientific Name: *Lepomis cyanellus*
Common Name: Green sunfish
BISON No.: 010530

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):

No federal or state listing.
The status of populations of green sunfish are established and stable in New Mexico in the San Juan, Zuni, San Francisco, Gila, and Rio Grande drainages; localized in the Mimbres drainage; and stable in the Pecos, Canadian and Dry Cimarron (Sublette et al 1990).
Threats to green sunfish are premature desertion of nests by male centrarchids attributed to a rapid decline in water temperature (Hunter 1963). Hybrids have been reported between green sunfish and bluegill or longear sunfish (Sublette et al 1990).

Distribution (narrative)**:**

Originally the green sunfish was restricted to east-central North America, west to Appalachians from Ontario and New York to eastern North Dakota, south to Georgia and northeastern Mexico (Lee et al 1981). The green sunfish is also native to North America east of the Continental Divide and west of the Appalachians, form the Great Lakes region south to the gulf coastal states and into northeastern Mexico, and introduced widely throughout much of the United States and parts of Mexico (Sublette et al 1990). It is believed the green sunfish was introduced into other drainages of the state prior to 1950; however, museum and stocking records do not substantiate this in every case (Sublette et al 1990). Large populations of green sunfish occur in the San Carlos River, in stony tributaries of the Salt River mainstream in Salt River Canyon, and in Burro Creek and other smaller streams of the Bill Williams River basin, Arizona (Minckley 1973). In smaller perennial streams such as the Black River, green sunfish usually occur throughout the drainage (Cowley and Sublette 1987). Green sunfish are native to the Pecos and Canadian drainages (Sublette et al 1990).

Key Distribution/Abundance/Management Areas:

Panel key distribution/abundance/management areas:

Breeding (narrative)**:**

Green sunfish spawning begins in the spring and continues until late summer in water temperatures between 15-31ºC (Stuber et al 1982). Green sunfish have more than one breeding period during a season (Kramer & Smith, 1962). The spawning period of a male sunfish occasionally extended over three or four successive days, but usually restricted to one or two days (Hunter 1963). If available, areas sheltered by rocks, logs and clumps of grass are nearly always used for nest sites, and abandoned sunfish nests are used by male green sunfish as a site for a new nest (Hunter 1963). Hunter (1963) found a correlation between water temperature and nesting periods, and the peak of each period of nest establishment nearly always coincided with a rise in the mean water temperature. The nesting and spawning periods occur at an average frequency of eight or nine days during the breeding season and never varied from the average frequency (Hunter 1963). The frequency of nesting periods of the green sunfish population seems to be controlled primarily by water temperature and changes in the reproductive state of the male sunfish (Hunter 1963). Nesting periods were nearly always initiated during a time of rising water temperature (Hunter 1963). Nesting often occurs in hot, shallow pools of streams, over sand, gravel, or bedrock (Minckley 1973).

If females are present on the spawning grounds, males usually commenced spawning on the day they constructed their nests or on the following day (Hunter 1963). When males commenced spawning many females and non-nesting males assembled near the nest, and eventually some of the males in the congregation commenced digging nests in the vicinity of the original nest and a colony of nesting sunfish was established (Hunter 1963). Spawning is accomplished in the manner typical of all centrarchids: the male and female circled in the nest side by side, paused

momentarily and released sperm and eggs (Hunter 1963). The eggs are laid in nests scooped out of gravel or sandy silt by the male in depths of 4-355 cm (Stuber et al. 1982).
Green sunfish are remarkably tolerant of crowding among themselves, and reproduce at a small size under such conditions so that they often stunt and create management problems in smaller lakes (Minckley 1973). Nearly all centrarchid males exhibit territorial behavior while they are occupying a nest (Hunter 1963), and the male defends the nests until the larvae emerge (Sublette et al 1990).

Habitat (narrative)**:**

The green sunfish is ecologically tolerant of many habitats, but does not normally occur in brackish water (Lee et al 1981). The green sunfish is highly adaptable, but tends to become most abundant in rocky situations, of either lakes or streams, in areas where other sunfish are absent or uncommon (Minckley 1973). The green sunfish has a capability to flourish in habitats generally unfavorable to any species but itself (Minckley 1973). It prefers warm, shallow waters, but will tolerate either clear or turbid situations (Sublette et al 1990). Green sunfish prefer sites that have low velocity within the temperature range of 26-30ºC (Stuber et al 1982). The green sunfish is almost always present near cover such as brushy banks, cliffs, or piles of rubble (Minckley 1973). In other states, green sunfish appear to prefer small, muddy-bottomed, lower gradient, and often-intermittent streams (Cross, 1967). In residual pools of intermittent streams of northeastern New Mexico, it is one of the last survivors and is apparently characteristic of such habitats throughout much of the Great Plains (Cross and Moss 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 green sunfish is highly predaceous, and large populations apparently compete with the young of other fishes for food, or prey directly upon them (Minckley 1973). The young green sunfish feed on zooplankton (Sublette et al 1990). Adults feed on a variety of foods, including insects, crayfish, small fish, and occasionally plant material; aquatic and terrestrial insects appear to be most important (Stuber et al. 1982).

Diet category (list):

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

Grazing Effects (narrative):

No specific information regarding grazing and green sunfish, however it is unlikely cattle grazing will negatively impact this species.

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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