

Scientific Name: *Ictiobus bubalus*
Common Name: Smallmouth buffalo
BISON No.: 010060

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):

State NM: Provides limited protection.

Populations of this species are abundant and secure (BISON 2002).

Threats to the smallmouth buffalo are turtles, snakes, and predacious birds (Canfield 1922).

Large numbers of smallmouth buffalo have been taken from this reservoir by commercial fisherman (Moody 1970); however, biomass of this species apparently declined in the 1960s as a result of commercial fishing (Sublette et al. 1990).

Distribution (narrative):

The smallmouth buffalo is confined primarily to larger tributaries of Mississippi basin from Montana east to West Virginia and Pennsylvania, and in Gulf slope drainages from Mobile Bay west to Rio Grande basin, Texas and Mexico (Lee et al. 1981). The smallmouth buffalo is found in the lower Pecos River and its tributaries (Cowley and Sublette 1987).

Key Distribution/Abundance/Management Areas:

Panel key distribution/abundance/management areas:

Breeding (narrative):

The only documentation regarding breeding behavior of smallmouth buffalo is attributed to Canfield (1922). The bulk of the spawning takes place during normal spring floods of rivers of the Mississippi drainage, and spawning begins when water temperature reaches 60° F (Canfield 1922). The smallmouth buffalo spawns from March to September at 15.5 - 27.5°C, with peak activity in July, and spawns on shoals of lakes at depths of 1.2 - 6.1 m (Lee et al. 1981). In New Mexico, spawning occurs from April to September, primarily over inundated terrestrial vegetation during times of higher water level (Moody 1970; Jester 1971), and in water temperatures of 16.1 to 27.5° C (Sublette et al. 1990). The parent fish prepares no nest the eggs are expelled, fertilized, and no parental care is given (Canfield 1922). The eggs, which are demersal and adhesive, are broadcast over virtually all substrate types and are unattended by adults (Jester 1971, 1973; Padilla 1972). Under favorable temperatures the eggs "eye" in 3 or 4 days and hatch in 9 or 10 days (Canfield 1922). The newly hatched fry move immediately towards the surface (Canfield 1922). Good reproduction was reported as being dependant on a pH level of 6.5 - 8.5 by Stroud (1967); however, good reproduction occurs in New Mexico where waters are almost invariably above pH 7.0 (Sublette et al. 1990). Size determines sexual maturity, with individuals that have attained the weight of 450 g generally being mature (Edwards and Twomey 1982).

Habitat (narrative):

The smallmouth buffalo is common in clear waters with modest current (Lee et al. 1981). They tend to remain in slightly shallower waters and most often over sand or silt bottoms (Minckley 1973). In New Mexico, smallmouth buffalo inhabit larger pools of higher order rivers with low velocity current and lower elevation impoundments, and it prefers clean to moderately turbid, deep, warm waters (Sublette et al. 1990). Dalquest and Peters (1966) report that the most productive habitat for smallmouth buffalo is one with abundant aquatic vegetation and a silt bottom.

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):

Smallmouth buffalo fish are not cannibalistic (Canfield 1922). The smallmouth buffalo feed extensively from the bottom, and they ingest innumerable aquatic animals found on the bottom and in the soft bottom soil or ooze (Canfield 1922). They consume quantities of aquatic vegetation besides collecting from it much animal life, and eat terrestrial as well as aquatic grains and seeds, the young and adults often entering shallow waters to obtain food and abundance (Canfield 1922). Principal foods include ostracods and dipteran larvae (Lee et al 1981). The smallmouth buffalo feeds primarily on the nearshore bottom (McComish 1967). They also fed upon a greater diversity of organisms than the other species, which may reflect their tendencies to move into the more diversified, shallower, littoral zone (Minckley 1973). Clams (*Corbicula*) made up a substantial part of the diet in certain times of year (Minckley 1973). Major food items of young smallmouth buffalo include cladocerans and coepods and algae (McComish 1967; Vainio 1973). Adult smallmouth buffalo are principally bottom feeders, taking a wide

variety of insects, crustaceans, algae, and other invertebrates and plant material (Sublette et al 1990). The species feeds primarily in shallow shoreline areas of reservoirs (McComish 1967).

Diet category (list):

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

Grazing Effects (narrative):

There is no specific information with respect to cattle grazing and the smallmouth buffalo, however, grazing could have an impact on spring habitats occupied by the species since the smallmouth buffalo is common in clear waters with modest current (Lee et al. 1981).

Panel limiting habitat component relative to grazing and comments:
<p>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</p>

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:
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Authors

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

Bibliography:

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Sublette, J. E., M. D. Hatch, and M. Sublette. 1990. The Fishes of New Mexico. University of New Mexico Press. Albuquerque. 393 pp.