ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Animal Abstract **Element Code:** AFCJC11010
Data Sensitivity: Yes

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Xyrauchen texanus*
COMMON NAME: Razorback Sucker
SYNONYMS: *Catostomus texanus, Catostomus cypho, Xyrauchen cypho*
FAMILY: Catostomidae

AUTHOR, PLACE OF PUBLICATION: Abbott 1861. Proceedings of the Academy of Natural Sciences of Philadelphia

TYPE LOCALITY: Colorado and New rivers, Arizona

TYPE SPECIMEN: Unknown

TAXONOMIC UNIQUENESS: *Xyrauchen* is one of several monotypic genera of the family Catostomidae (USFWS 2018).

DESCRIPTION: From Bestgen (1990); "The body shape is elongate, robust, and somewhat laterally compressed. The caudal peduncle tends to be short and deep. An enlargement of the interneural bones forms the distinctive razor-like keel, providing basis for the common name, razorback sucker. The moderate-sized mouth has a clefted lower lip, and lateral margins of the lips are continuous and rounded. Razorback sucker have elongated heads with a flattened dorsal surface and well-developed fontanelle. There are usually 14–15 primary dorsal fin rays, seven primary anal fin rays, 45–47 vertebrae, 68–87 scales in the lateral series, with 44–50 gill rakers on the first arch. Body coloration is dark brown to olivacious on the upper dorso-lateral surfaces and ranges from yellow to white on the lower ventro-lateral surfaces. Adults can reach up to 1,000 mm (3.3 ft) total length (TL) and weigh 6 kg (13.2 lbs), but they are more typically found within the 400–700 mm (1.3-2.3 ft) TL range, weighing less than 3 kg (6.6 lbs). During spawning, razorback sucker are sexually dimorphic, with breeding males showing bright yellow and orange laterally and ventrally, dark dorsal surfaces, and tuberculation, especially on the anal and caudal fins, and females exhibiting a distended genital papillus."

Skeletal measurements indicate a heavily ossified and thickened morphology, potentially from adaptation to strong river currents historically occupied by the species (Eastman 1980).

AIDS TO IDENTIFICATION: Adults razorbacks are easily distinguished from other suckers by the prominent predorsal keel. Young lack a keel and may be difficult to distinguish from other *Catostomus* species.

ILLUSTRATIONS:
B&W photo (Minckley 1973:153)
B&W drawing (Page and Burr 1991)
Color photo (Rinne and Minckley 1991:33)
B&W drawing (Sublette et al. 1991:227)
B&W photo (Sublette et al. 1991:228)

TOTAL RANGE: Endemic to large rivers of the Colorado River Basin from Wyoming to Mexico, including the states of Colorado, Utah, New Mexico, Nevada, California, Sonora, and Baja. Razorback sucker are thought to have been uncommon in turbulent, canyon-bound reaches, with robust populations typically being found in calm, flatwater river reaches (Tyus 1987; Lanigan and Tyus 1989; Bestgen 1990). Currently, *X. texanus* occurs and spawns throughout much of its historic range due to stocking of hatchery-produced fish, though some areas have patchy distributions. The only known wild population of razorback sucker in the Colorado River basin to consistently demonstrate natural recruitment occurs in Lake Mead (Shattuck et al 2011). Razorback suckers have been extirpated from the Gila River basin and reestablishment efforts have not been successful (USFWS 2018).

RANGE WITHIN ARIZONA: Historically razorback suckers inhabited the Colorado, Gila, Salt, Verde, and San Pedro rivers. Razorback suckers have been extirpated from the Gila River basin. Stocking has been conducted at multiple sites throughout the drainage, but no evidence of reproduction or recruitment has been found (USFWS 2018). Presently populations occur in Lake Mead and upstream to the lower Grand Canyon, Lake Mojave, Lake Havasu, and the Colorado River below Parker dam. All except for the Lake Mead population are maintained by stocking. (Albrecht et al. 2014; Kegerries, Albrecht, Gilbert et al. 2017; Kegerries, Albrecht, Rogers et al. 2017).

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: Razorback suckers are long lived. Older individuals in Lake Mohave have been estimated at 40 + years. They tend to grow quickly in the first five to seven years, with growth being slow or nonexistent in old individuals. Maturity is reached in 2-6 years, depending on rearing habitat. Usually sedentary, but they can travel significant distances on occasion. The "keel" along the back and inset eyes are likely adaptive features to the high flood events of historical habitat.

REPRODUCTION: Spawning occurs from late winter through spring along flat to gently sloping gravelly shorelines or bays, generally in less than 2 m (6.6 ft) of water. Spawning season varies latitudinally, with spawning in the Upper Colorado River Basin occurring from mid-April to mid-June, while the majority of spawning occurs between January and April in the Lower Colorado River Basin (USFWS 2018). Evidence suggests that suckers migrated from larger rivers to smaller tributaries prior to spawning, presumably allowing additional thermal units to be obtained. Razorback sucker display strong spawning site fidelity in both lentic and lotic habitats (Modde and Haines 2005). A single female is attended by 2 to 12 males, and the group moves in tight circles over the bottom. Spawning takes place when the group settles to

the bottom and with a vibrating action release gametes. The eggs are adhesive and attach to the interstitial spaces within the gravel substrate. The young hatch in a few days and live along the shoreline for a time. Females will spawn repeatedly with several males. Sublette et al. (1991) describe changes in breeding males: "Males become dark brown to black on the back and develop a russet- to orange-colored lateral band and yellow belly. Coarse, sharp tubercles, which are hornlike outgrowths of skin, are developed on the anal, caudal, and pelvic fins, and on the caudal peduncle." Hatching success is highly dependant on water temperature above 8° C (46° F), and is most successful from 9.5°C to 20°C (49°F to 68°F) (Bozek et al. 1990).

Razorback suckers are known to hybridize with flannelmouth suckers, Sonora suckers, and nonnative white suckers. Hatchery propagation has been successful and is being utilized for reintroduction programs.

FOOD HABITS: Razorback sucker diet differs with habitat type. Lotic adult razorback sucker consume a mixture of benthic invertebrates, algae, detritus, and inorganic materials. Lentic-inhabiting sucker diets are dominated by cladoceran zooplankton though some algal and detrital materials are present in gut contents (Marsh 1987).

HABITAT: Use a variety of habitat types from mainstem channels to slow backwaters of medium and large streams and rivers, sometimes around cover. Historically, razorback sucker inhabited virtually all components of low velocity riverine habitat; backwaters, floodplains, sloughs, oxbow lakes, and other slackwater habitats within the main channel were particularly important (Holden 1973, Holden and Stalnaker 1975, Behnke and Benson 1983, Minckley 1983). In impoundments they prefer depths of a meter or more over sand, mud or gravel substrates. Adult razorbacks tolerate a wide range of temperatures from near freezing temperatures to 32.0º C (89.6º F), with optimum temperatures around 22-25º C (71.6-77.0º F). Razorback suckers are tolerant of a wide range of water quality conditions including pH ranges between 6.0 and 9.0, dissolved oxygen levels as low as 2.0mg/L, and salinities up to 23,000–27,750 µS/cm (Slaughter et al. 2002, Stolberg 2012). Few adult sucker utilize swift whitewater habitats, though movement through these locations has been documented (Albrecht et al. 2014, Kegerries et al. 2015).

Three specific habitat types are considered necessary to complete the life cycle: 1. Spawning habitat of rocky substrates of boulder, cobble, and clean gravel along river margins, mid-channel bars, and island complexes, or reservoir, backwater, and floodplain shorelines. 2. Larvae and juveniles need access to persistent, shallow, and warm, sheltered shorelines of backwaters, floodplains, etc. with cover (turbidity and/or vegetation) to avoid predation. 3. Adults need pockets of deeper water, either in reservoirs or large eddies and pools with slow velocities (USFWS 2018).

ELEVATION: Intermediate to low elevation rivers. Arizona records indicate elevations of 181 - 5,000 ft. (55 – 1,525 m), which includes some introduced sites.

PLANT COMMUNITY:

POPULATION TRENDS: The razorback sucker was once common in many of the rivers of the Colorado River Basin. In recent times with the impoundment of large rivers and other habitat alterations, there exist a few isolated adult populations in several large impoundments. Due to lack of recruitment these populations remain small. Lack of recruitment is due primarily to adverse changes in the temperature of water released from impoundments and to predation on eggs and larvae by non-native introduced species of fish. There has been limited success from reintroductions of young individuals. According to Minckley (AGFD Native Fish Diversity Review 1995), they are reproducing in the upper basin, but not recruiting. He also states that there is an unconfirmed report of razorback recruitment occurring at Dinosaur National Monument, but he thinks this is doubtful.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS:
LE, PT (USDI, FWS 1991, 2021)
Critical Habitat (CH) Designated (USDI, FWS 1994)
[CH Proposed (USDI, FWS 1993)]
[LE (USDI, FWS 1991)]
[PE (USDI, FWS 1990)]
[UR (USDI, FWS 1989b)]
[C1 USDI, FWS 1989a]
[C2 USDI, FWS 1982, 1985]
[PT withdrawn (USDI, FWS 1980)]
[PT (USDI, FWS 1978)]

STATE STATUS:
1 (AZGFD, AWCS 2022)
[1A (AGFD SWAP 2012)]
[WSC (AGFD, WSCA 1996 in prep)]
[Endangered (AGFD, TNW 1988)]

OTHER STATUS:
Bureau of Land Management Sensitive (USDI, BLM AZ 2017)
Not Forest Service Sensitive (USDA, FS Region 3, 2013, 2007, 1999)
[Forest Service Sensitive, USDA, FS Region 3 1988, A-S National Forest 2000]
P, Determined Endangered in Mexico (NORMA Oficial Mexicana NOM-059-SEMARNAT-2010)
[Listed Endangered, Secretaría de Medio Ambiente 2000, 1994]
Group 2 (NNDFW, NESL 1994, 2001, 2008)

MANAGEMENT FACTORS:

Threats: climate change and drought; altered flow hydrology and cold tailwater releases from reservoirs; dams and diversions; hybridization; inbreeding and lack of genetic diversity; predation by and competition with nonnative fishes; pollution; possibly parasites.

Management needs: ameliorate effects of reservoirs and nonnative fish species in razorback waters; monitor status of populations; complex lotic and lentic habitat; suitable water temperature and quality; variable flow regimes; habitat connectivity; multiple interconnected, naturally recruiting, and resilient populations; genetic and ecological diversity.

PROTECTIVE MEASURES TAKEN: The razorback sucker was listed (USFWS October 23, 1991) as an endangered species in 19991 with critical habitat designated in 1994. The species was proposed to be reclassified to Threatened in 2021 due to substantial improvements in species status since listing (USDI, FWS 2021). Critical habitat in Arizona includes: the Colorado River and its 100 year flood plain from the confluence with the Paria River to Davis Dam including Lakes Mead and Mohave to full pool elevation, from Parker Dam to Imperial Dam including Imperial Reservoir to the full pool elevation or 100 year flood plain whichever is greater, the Gila River and its 100 year flood plain from the AZ-NM border to Coolidge Dam including San Carlos Reservoir to the full pool elevation, the Salt River and its 100 year flood plain from State Route 77 bridge to Roosevelt Diversion Dam, the Verde River and its 100 year flood plain from Forest Service boundary (Prescott National Forest in the vicinity of Perkinsville) to Horseshoe Dam, including Horseshoe Lake to full pool elevation. A Razorback Sucker Recovery Plan was completed in 1998, and recovery goals that amended and supplemented the 1998 plan were approved in 2002 (USFWS 1998, USFWS 2002). Downlisting criteria require genetically and demographically viable, self-sustaining razorback sucker populations in the Green River subbasin and either the Colorado River subbasin or the San Juan River subbasin, a genetic refuge in Lake Mohave, and two genetically and demographically viable, self-sustaining populations in the lower basin. Delisting requires population improvements for three consecutive years post-downlisting (USFWS 2018). The 2012 5-year review indicated that recovery goals should be updated with new information (USFWS 2012). Routine monitoring of existing populations, as well as artificial propagation and reintroduction programs are in progress.

In Arizona, the Glen Canyon Dam Adaptive Management Program coordinates research and monitoring activities aimed at protection of natural resources of the Colorado River through the Grand Canyon. The Lower Colorado River Multi-Species Conservation Program is a partnership of federal and non-federal stakeholders to balance use of lower Colorado River water resources and conservation of native species and habitats in compliance with the Endangered Species Act through a Habitat Conservation Plan. Other conservation entities include the Gila River Basin Conservation Program, the Salt River Project's Horseshoe-Bartlett Habitat Conservation Plan, the Lake Mohave Native Fish Workgroup, and the Lake Mead Razorback Sucker Workgroup.

SUGGESTED PROJECTS: As identified and implemented by management programs: 1. Reestablish populations with hatchery-produced fish. 2. Identify and maintain genetic variability of razorback sucker in Lake Mohave. 3. Provide and legally protect habitat

(including flow regimes necessary to restore and maintain required environmental conditions) necessary to provide adequate habitat and sufficient range for all life stages to support recovered populations. 4. Provide passage over barriers within occupied habitat to allow unimpeded movement and, potentially, range expansion. 5. Investigate options for providing appropriate water temperatures in the Gunnison River. 6. Minimize entrainment of subadults and adults at diversion/out-take structures. 7. Ensure adequate protection from overutilization. 8. Ensure adequate protection from diseases and parasites. 9. Regulate nonnative fish releases and escapement into the main river, floodplain, and tributaries. 10. Control problematic nonnative fishes as needed. 11. Minimize the risk of hazardous-materials spills in critical habitat. 12. Remediate water-quality problems. 13. Minimize the threat of hybridization with white sucker. 14. Provide for the long-term management and protection of populations and their habitats beyond delisting (i.e., conservation plans) (USFWS 2018).

LAND MANAGEMENT/OWNERSHIP: BIA - San Carlos Reservation; BLM - Yuma Field Office; FWS - Bill Williams, Cibola, and Havasu National Wildlife Refuges; NPS - Glen Canyon and Lake Mead National Recreation Areas; USFS - Apache-Sitgreaves, Coconino, Prescott, and Tonto National Forests; Lake Havasu State Park; La Paz County Park; TNC - Hassayampa River Preserve; Private.

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ADDITIONAL INFORMATION:

Razorback suckers were an important food fish for modern populations along the Colorado River. Commercial fisheries existed as recently as 1949 (Minckley, 1973). Early maturity and longevity is characteristic of fish species that do not successfully recruit every year. Historically razorbacks may have only had successful spawning when conditions were just right.

The species name *texanus* is based on a misunderstanding that the earliest specimens erroneously originated from the Colorado River in Texas (Marsh et al. 2015).

Revised: 1994-09-12 (AWM)
1994-09-20 (MHH)
1995-01-29 (KLY)
2001-10-22 (SMS)
2002-12-09 (RHB)
2020-09-16 (KSL)
2023-01-09 (MBL)

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