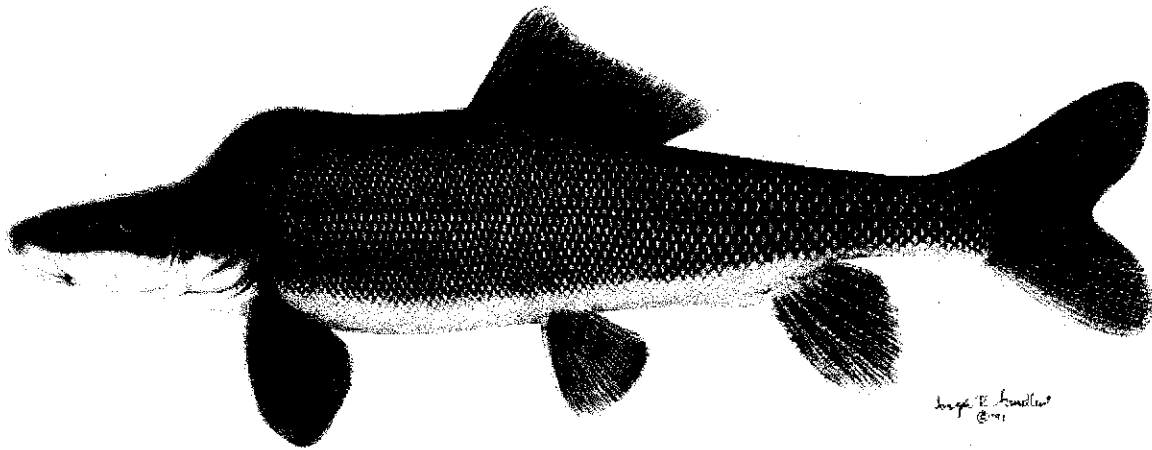


# **EXHIBIT 7**

**RAZORBACK SUCKER**  
*(Xyrauchen texanus)*  
**RECOVERY GOALS**



**RAZORBACK SUCKER (*Xyrauchen texanus*)**

**RECOVERY GOALS**  
**Amendment and Supplement to the Razorback Sucker Recovery Plan**

**U.S. Fish and Wildlife Service**  
**Mountain-Prairie Region (6)**  
**Denver, Colorado**

Approved: \_\_\_\_\_

*Ralph Q. Mergens*

Regional Director, Region 6, U.S. Fish and Wildlife Service

Date: \_\_\_\_\_

8/1/02

## EXECUTIVE SUMMARY

This document amends and supplements the Razorback Sucker Recovery Plan of 1998. The purpose of this document is to describe site-specific management actions/tasks; provide objective, measurable recovery criteria; and provide an estimate of time to achieve recovery of the endangered razorback sucker (*Xyrauchen texanus*), according to Section 4(f)(1) of the Endangered Species Act of 1973, as amended. Recovery or conservation programs that include the razorback sucker will direct research, management, and monitoring activities and determine costs associated with recovery.

**Current Species Status:** The razorback sucker is listed as endangered under the Endangered Species Act of 1973, as amended. The species is endemic to the Colorado River Basin of the southwestern United States. Adults attain a maximum size of about 1 m total length (TL) and 5–6 kg in weight. Remaining wild populations are in serious jeopardy. Razorback sucker are currently found in small numbers in the Green River, upper Colorado River, and San Juan River subbasins; lower Colorado River between Lake Havasu and Davis Dam; reservoirs of Lakes Mead and Mohave; in small tributaries of the Gila River subbasin (Verde River, Salt River, and Fossil Creek); and in local areas under intensive management such as Cibola High Levee Pond, Achii Hanyo Native Fish Facility, and Parker Strip.

**Habitat Requirements and Limiting Factors:** Historically, razorback sucker were widely distributed in warm-water reaches of larger rivers of the Colorado River Basin from Mexico to Wyoming. Habitats required by adults in rivers include deep runs, eddies, backwaters, and flooded off-channel environments in spring; runs and pools often in shallow water associated with submerged sandbars in summer; and low-velocity runs, pools, and eddies in winter. Spring migrations of adult razorback sucker were associated with spawning in historic accounts, and a variety of local and long-distance movements and habitat-use patterns have been documented. Spawning in rivers occurs over bars of cobble, gravel, and sand substrates during spring runoff at widely ranging flows and water temperatures (typically greater than 14°C). Spawning also occurs in reservoirs over rocky shoals and shorelines. Young require nursery environments with quiet, warm, shallow water such as tributary mouths, backwaters, or inundated floodplain habitats in rivers, and coves or shorelines in reservoirs. Threats to the species include streamflow regulation, habitat modification, competition with and predation by nonnative fish species, and pesticides and pollutants.

**Recovery Objective:** Downlisting and Delisting.

**Recovery Criteria:** Objective, measurable criteria for recovery of razorback sucker in the Colorado River Basin are presented for each of two recovery units (i.e., the upper basin, including the Green River, upper Colorado River, and San Juan River subbasins; and the lower basin, including the mainstem and its tributaries from Glen Canyon Dam downstream to the southerly International Boundary with Mexico) because of different recovery or conservation programs and to address unique threats and site-specific management actions/tasks necessary to minimize or remove those threats. Recovery of the species is considered necessary in both the

upper and lower basins because of the present status of populations and existing information on razorback sucker biology. Self-sustaining populations will need to be established through augmentation. Without viable wild populations, there are many uncertainties associated with recovery of razorback sucker. The razorback sucker was listed prior to the 1996 distinct population segment (DPS) policy, and the U.S. Fish and Wildlife Service (Service) may conduct an evaluation to designate DPSs in a future rule-making process. These recovery goals are based on the best available scientific information, and are structured to attain a balance between reasonably achievable criteria and ensuring the viability of the species beyond delisting. These recovery criteria will need to be reevaluated and revised after self-sustaining populations are established and there is improved understanding of razorback sucker biology.

Downlisting can occur if, over a 5-year period: (1) genetically and demographically viable, self-sustaining populations are maintained in the Green River subbasin and EITHER in the upper Colorado River subbasin or the San Juan River subbasin such that — (a) the trend in adult (age 4+;  $\geq 400$  mm TL) point estimates for each of the two populations does not decline significantly, and (b) mean estimated recruitment of age-3 (300–399 mm TL) naturally produced fish equals or exceeds mean annual adult mortality for each of the two populations, and (c) each point estimate for each of the two populations exceeds 5,800 adults (5,800 is the estimated minimum viable population [MVP] needed to ensure long-term genetic and demographic viability); and (2) a genetic refuge is maintained in Lake Mohave of the lower basin recovery unit; and (3) two genetically and demographically viable, self-sustaining populations are maintained in the lower basin recovery unit (e.g., mainstem and/or tributaries) such that — (a) the trend in adult point estimates for each population does not decline significantly, and (b) mean estimated recruitment of age-3 naturally produced fish equals or exceeds mean annual adult mortality for each population, and (c) each point estimate for each population exceeds 5,800 adults; and (4) when certain site-specific management tasks to minimize or remove threats have been identified, developed, and implemented.

Delisting can occur if, over a 3-year period beyond downlisting: (1) genetically and demographically viable, self-sustaining populations are maintained in the Green River subbasin and EITHER in the upper Colorado River subbasin or the San Juan River subbasin such that — (a) the trend in adult point estimates for each of the two populations does not decline significantly, and (b) mean estimated recruitment of age-3 naturally produced fish equals or exceeds mean annual adult mortality for each of the two populations, and (c) each point estimate for each of the two populations exceeds 5,800 adults; and (2) a genetic refuge is maintained in Lake Mohave; and (3) two genetically and demographically viable, self-sustaining populations are maintained in the lower basin recovery unit such that — (a) the trend in adult point estimates for each population does not decline significantly, and (b) mean estimated recruitment of age-3 naturally produced fish equals or exceeds mean annual adult mortality for each population, and (c) each point estimate for each population exceeds 5,800 adults; and (4) when certain site-specific management tasks to minimize or remove threats have been finalized and implemented, and necessary levels of protection are attained.

Conservation plans will go into effect at delisting to provide for long-term management and protection of the species, and to provide reasonable assurances that recovered razorback sucker

populations will be maintained without the need for relisting. Elements of those plans could include (but are not limited to) provision of flows for maintenance of habitat conditions required for all life stages, regulation and/or control of nonnative fishes, minimization of the risk of hazardous-materials spills, and monitoring of populations and habitats. Signed agreements among State agencies, Federal agencies, American Indian tribes, and other interested parties must be in place to implement the conservation plans before delisting can occur.

**Management Actions Needed:**

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).

**Estimated Time to Achieve Recovery:** Extant populations of razorback sucker are small with little or no recruitment. Therefore, use of hatchery fish (progeny of cultured brood stock) will be necessary to establish new populations or augment existing populations. Time to achieve recovery of the razorback sucker cannot be accurately estimated until self-sustaining populations are established through augmentation and habitat enhancement. The rate at which populations become established will depend on survival of stocked fish in the wild, integration of stocked fish with wild stocks, reproductive success, and recruitment. Response of the species to ongoing management activities will need to be assessed through monitoring, and strategies for recovery and estimates of time to achieve recovery will be reevaluated periodically. Based on current information and associated uncertainties, it is estimated that self-sustaining populations of razorback sucker will become established over the next 15 years. During this time, population dynamics and responses to management actions will be evaluated.

For razorback sucker populations to be self-sustaining, adults must reproduce and recruitment of young fish into the adult population must occur at a rate to maintain the population at a minimum

of 5,800 adults. When this occurs, the definition of a “self-sustaining” population is met, and the “clock” starts on the downlisting and delisting process.

Once self-sustaining populations have been established, reliable population estimates, based on a multiple mark-recapture model, are needed for all populations over a 5-year monitoring period for downlisting and over a 3-year monitoring period beyond downlisting in order to achieve delisting. The accuracy and precision of each point estimate will be assessed by the Service in cooperation with the respective recovery or conservation programs, and in consultation with investigators conducting the point estimates and with qualified statisticians and population ecologists. Self-sustaining populations and first reliable point estimates for all populations are expected by 2015. If those estimates are acceptable to the Service and all recovery criteria are met, downlisting could be proposed in 2020 and delisting could be proposed in 2023.