Highest Conservation Priority – Big River Species

Highfin Carpsucker *Carpiodes velifer*

Robust Redhorse *Moxostoma robustum*

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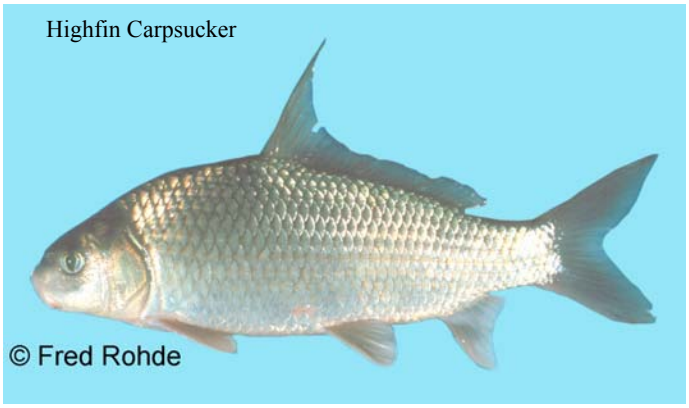
DESCRIPTION



Taxonomy and Basic Description

The highfin carpsucker is a member of the family Catostomidae, which is represented by eight genera and 25 species in the mid-Atlantic region (Rohde et al. 1994). This family is characterized by soft-rayed fins; a mouth located on the underside of the head, thick fleshy distensible lips, and paired fins attached low on the body (Rohde et al. 1994). The genus *Carpiodes* contains primitive, deep bodied, silver colored carpsuckers with a long dorsal fin (Jenkins and Burkhead 1994). The taxonomic status of the highfin carpsucker on the Atlantic slope is in question (Lee et al. 1980). Current work suggests that the fish is an undescribed species, similar to but distinct from the true highfin carpsucker of the Mississippi drainage. The highfin carpsucker resembles the quillback (*Carpiodes cyprinus)*, but the highfin carpsucker has a steeper forehead. Highfin carpsuckers range in length to 50 cm (19.7 inches) (Rohde et al. 1994).

The robust redhorse is a large, heavy-bodied sucker that can reach lengths greater than 70 cm (17.6 inches) and weights up to 8 kg (17.6 pounds). The robust redhorse has large molar-like pharyngeal teeth specialized for crushing hard bodied prey like native mussels. It resembles the river redhorse, *M. carinatum,* but has ten pelvic rays instead of nine (Rohde et al 1994). The fish is bronze on the back and sides and adults are faintly striped on the lower sides. Juveniles have intense red in the caudal fin, which becomes less obvious in adults. Breeding males develop prominent tubercles on the snout, head and anal and caudal fins (GADNR 1999).

After specimens of a large redhorse collected in Georgia and North Carolina in the 1980s and early 1990s were determined to be the fish described by Cope (1870) as *M. robustum*, major revisions of sucker taxonomy were initiated. Jenkins and Burkhead (in a footnote) applied the name *M. robustum* to the large rediscovered redhorse and called it robust redhorse. Smallfin

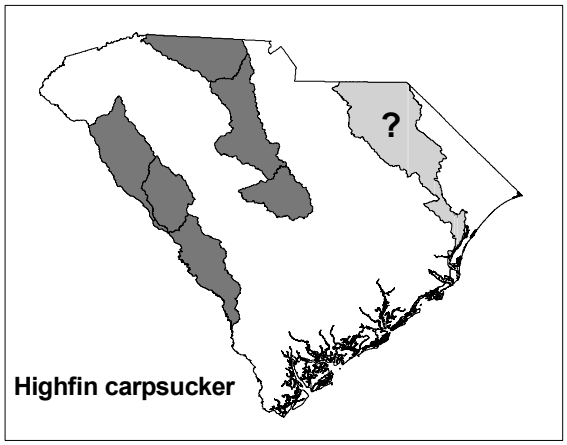
redhorse was moved to the newly elevated genus *Scartomyzon* and given the common name brassy jumprock. Its taxonomic status has still not been completely resolved (NatureServe 2004).

Status

The robust redhorse carries no legal status in South Carolina or North Carolina, but is listed as endangered in Georgia. It is considered critically imperiled (S1) in North Carolina and Georgia, which are the only other states where it occurs (NatureServe 2004). In a recent assessment of southeastern fishes, the robust redhorse was considered in danger of extinction throughout all or part of its range (Warren et al. 2000).

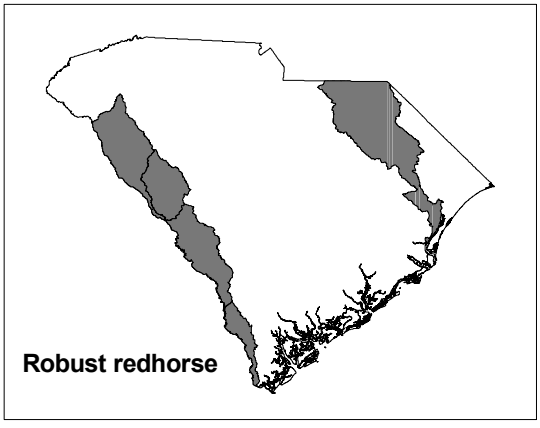
The highfin carpsucker is not listed in South Carolina; however it's limited distribution and questionable taxonomic status likely warrants listing in South Carolina.

POPULATION DISTRIBUTION AND SIZE



Distribution

The highfin carpsucker, in the broad sense, is distributed throughout the Lake Michigan drainage and Mississippi River basin from Pennsylvania south to Louisiana (NatureServe 2004). It also occurs on the Atlantic slope from the Cape Fear River to Savannah River drainages and Gulf slope drainages from Choctawhatchee River, Alabama and Florida to the Pearl River, Louisiana and Mississippi (Page and Burr 1991). The Atlantic slope and gulf slope populations likely differ at the species level from those of the Mississippi and Lake Michigan drainages. In South Carolina, the highfin carpsucker occurs in the Broad and Congaree Rivers in the upper Santee River basin and the Savannah River. Historically the highfin carpsucker also occurred in the Pee Dee River; however, that population may have been extirpated (H. Bart, pers. comm.).



Robust redhorse are now known to exist in the Ocmulgee and Oconee rivers (Georgia), the Savannah River (Georgia/South Carolina) and the Pee Dee River (North Carolina/South Carolina). In addition to wild populations, small stocked populations have been established by introducing fish in the Ocmulgee, Ogeechee and Broad Rivers in Georgia (RRCC 2004).

Population Size and Trend

Highfin carpsucker population size and trend is not well known. There appear to be healthy populations with recruitment in the Broad River, Congaree River and Savannah River. If the highfin carpsucker does still exist in the Pee Dee River, it would have to be considered a remnant population. Preservation of populations in the Santee River are extremely important to the global preservation of the species given declining populations in the Cape Fear River and Pee Dee River (W. Starnes, pers. comm.).

Robust redhorse population size in the Oconee River was originally estimated as approximately 1,000 to 3,000 adults in an 80 km (50 mile) section of river. Annual sampling currently suggests that the Oconee population may not be reproducing at levels sufficient to sustain the population. Further, this population is vulnerable to catastrophic events (NatureServe 2004). The latest population estimate for the Oconee River is fewer than 200 adults (J. Evans, GA DNR pers. comm., August, 2004).

The Savannah River appears to be supporting a substantial population of robust redhorse (RRCC 2004). However, no estimates of the size of the Savannah population have been made to date. Although, populations estimates for the Savannah River are currently ongoing (W. Starnes, pers. comm.).

Status surveys for robust redhorse in the Yadkin /Pee Dee drainage have identified what appears to be a remnant population. Over a five-year period, seven specimens have been collected; however, several of these specimens were considered to be juveniles when captured.

Wirgin et al. (2001) examined mitochondrial DNA (mtDNA) variation in *M. robustum* and concluded that the Oconee/Ocmulgee River and Savannah River populations should be treated as evolutionarily significant units. Based on a very limited sample size, mtDNA variation supports the idea that the Yadkin/Pee Dee populations may represent a third evolutionarily significant unit.

HABITAT AND NATURAL COMMUNITY REQUIREMENTS

The highfin carpsucker inhabits rivers in areas with moderate or swift current over sand or gravel substrate. Robust redhorse is known only from habitats in mainstream rivers where it has been collected in riffles, runs and pools. Adults are usually found in association with tree snags, often in deep water near shore. Spawning occurs in course gravel habitats (GADNR, 1999). Additionally, juvenile robust redhorse have been collected from various locations in Clarks Hill Reservoir (J. Strom Thurmond Reservoir). Fish stocked in the Broad River of Georgia have moved downstream into the reservoir and have survived quite well. These reservoir collections tend to indicate a tolerance of, or a preference for, lake habitat during a portion of the life cycle (RRCC 2000), though these habitats are not part of its natural riverine habitat.

CHALLENGES

Habitat loss and disruption of spawning migrations resulting from dams and impoundments; predation and competition by introduced nonnative species like buffalo, flathead catfish and blue

catfish; and significant deterioration of water quality due to sedimentation and pollution are believed to have contributed to the decline of the robust redhorse. Additionally, the limited range of known populations and low rates of recruitment to the adult population represent challenges to the species' future (RRCC 2004). Although it has a wider distribution, the highfin carpsucker shares the same challenges as the robust redhorse.

CONSERVATION ACCOMPLISHMENTS

The Robust Redhorse Conservation Committee (RRCC) was established in 1995 under a Memorandum of Understanding (MOU) between state and federal resource agencies, private industry and the conservation community to work proactively to recover the population across its historic range. The RRCC was formed in lieu of listing the species under the Endangered Species Act. Partners include thirteen signatory members to the MOU, two cooperating members under the MOU, and a variety of university research and resource management facilities as affiliate members.

A plan, entitled *Conservation Strategy for the Robust Redhorse* that provides overall conservation guidance to assure the continued survival of the species was adopted by the RRCC in 1998 and updated in 2003. It establishes short- and long-term conservation goals, describes the status and distribution of the species, discusses problems facing the species and presents conservation actions that should be implemented to accomplish short- and long-term goals (RRCC 2004). The recovery goal established by the RRCC is six self-sustaining populations of robust redhorse across its former range (Nichols 2003).

A total of 18,920 robust redhorse fingerlings (5 to 6 inches) were stocked into the Broad River by the SCDNR during fall 2004. Those fish were stocked below Neal Shoals and Parr Shoals Reservoirs. Stocking of robust redhorse into the Broad River will continue each year until a self–sustaining population is achieved (F. Sessions, SCDNR, pers. comm.).

CONSERVATION RECOMMENDATIONS

- Conduct surveys of South Carolina’s major drainages to determine the presence of both the robust redhorse and the highfin carpsucker.
- Determine habitat preference and utilization for various life stages for the robust redhorse and the highfin carpsucker.
- Characterize genetic relationships of existing wild populations for both the robust redhorse and the highfin carpsucker.
- Develop a greater understanding of life history for both the robust redhorse and the highfin carpsucker.
- Renew the MOU that formed the RRCC and continue working with partners to achieve the goals set forth in the conservation strategy developed by the RRCC for the robust redhorse.
- Identify, protect and enhance critical robust redhorse habitats.
- Reintroduce the robust redhorse to appropriate water bodies (Broad and Congaree Rivers) in South Carolina in order to establish self-sustaining populations.
- Consider species needs when participating in the environmental permit review process.

- Develop a Non-Game Fishes of South Carolina poster and other educational materials in order to raise public awareness of nongame species and their ecological importance to the natural history of South Carolina's aquatic habitats.

MEASURES OF SUCCESS

Determining the distribution, life history, habitat needs and southeastern population structure and trends would represent a measure of success for these species. Methods that protect water quality are also likely to protect most of these species. Establishment of a breeding population of robust redhorse in the Broad River would provide a measure of success to the stocking program for this species.