

Moderate Conservation Priority – Big River Species

Notchlip Redhorse *Moxostoma collapsum*

V-lip Redhorse *Moxostoma pappillosum*

White Catfish *Ameiurus catus*

Striped Bass *Morone saxatilis*

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DESCRIPTION

Taxonomy and Basic Description

The notchlip redhorse is a member of the family Catostomidae and belongs to the genus *Moxostoma*. *M. collapsum* was formerly downgraded to a race of *M. anisurum*, the silver redhorse (Jenkins 1970). Jenkins and Burkhead (1993)

reported that the Atlantic slope populations of *M. anisurum* appear to have a more elongate body form, smaller head parts and, perhaps, a tendency to occupy smaller streams than the Mississippi basin silver redhorse. Further, Warren et al. (2000) noted a forthcoming taxonomic rearrangement and recognized *M. collapsum* as a species distinct from *M. anisurum* (Nelson et al. 2004). Adult notchlip redhorse range in length from 350 to 450 mm (14 to 18 inches) and have a moderate to high-back form. These fish have a V-shaped lower lip with lip surfaces that are semipapillose. The dorsal fin has a slightly concave or straight margin and usually 14 or 15 dorsal rays. The upper tip of the caudal fin is often pointed with the lower tip usually rounded. The back is tan, brown or olive. The sides can be shiny silver, yellow, gold, copper or mixtures of these. Scale bases are a pale iridescent green. Pale red can be present in the dorsal and caudal fins with orange-red present in the lower fins (Jenkins and Burkhead 1993).



The V-lip redhorse is also a member of the family Catostomidae and belongs to the genus *Moxostoma*. Buth (1978) regarded the V-lip redhorse to be the most primitive species in the subgenus *Moxostoma*. The V-lip redhorse has been recently considered a sister species of the silver redhorse, *M. anisurum* (Jenkins and Burkhead 1993). Adult V-lip redhorse range in length from 230 to 325 mm (9 to 13 inches) and have an elongate body with slender form. These fish have a V-shaped lower lip with a finely

papillose lip surface. The dorsal fin is moderately concave and usually has 12 or 13 dorsal rays. The color of the back is tan-olive and often has a silver sheen. The sides are silver, gold or brassy, with dark scale bases. Faint red may be present at the edges of the caudal and anal fins. Paired fins are orange or pale red (Jenkins and Burkhead 1993).

The white catfish is a member of the family Ictaluridae and the genus *Ameiurus*, which contains medium-sized catfish. Five of the seven species of *Ameiurus* occur in South Carolina. This genus is characterized by a lack of scales, eight barbels, one stout spine supporting dorsal and pectoral fins, an upper jaw protruding over the lower, cardiform teeth on jaws and an adipose fin (Jenkins and Burkhead 1993).



The white catfish is bluish-gray to olive above and white on the belly with unmarked sides. The tail is slightly forked with rounded tips. Maximum length is 590 mm (23 inches), but white catfish are typically less than 500 mm (20 inches) long. The anal fin is convex with a ray count ranging between 19 and 23. White catfish feed on plants, insects and fish. Spawning occurs in late spring and early summer. These catfish are relatively long-lived, reaching a maximum of 14 years (Rohde et al. 1994; Jenkins and Burkhead 1993).



The striped bass is a member of the family Moronidae, which contains four North American species (Jenkins and Burkhead 1994) that are known as the temperate basses. The striped bass, commonly called “rockfish” or “lineside,” has a compressed moderately deep body

covered with ctenoid scales. Striped bass have an olive green back, a silvery flank with several thin dark lines and silvery white belly. Striped bass are a large robust fish attaining adult sizes of up to 2000 mm (78 inches), but most striped bass in freshwater systems are much smaller, measuring less than 1000 mm (39 inches).

Status

The notchlip redhorse is currently considered secure throughout its native range (Warren et al. 2000; NatureServe 2004); however, the secure designation was applied when notchlip redhorse was still considered a race of silver redhorse. With the elevation of notchlip redhorse to specific status, its limited range on the Atlantic Slope from Virginia to Georgia and population declines in several rivers such as the Neuse and Cape Fear Rivers, its status may be revised. Throughout its range, the notchlip redhorse is considered common to abundant (NatureServe 2004).

The V-lip redhorse is currently considered apparently secure (NatureServe 2004). Though it may be uncommon in certain areas like South Carolina, it is not considered rare. However, there is some concern about the long-term outlook for the species due to declines and other factors (NatureServe 2004).

The white catfish is considered to be currently stable by Warren et al. (2000) and common, widespread and abundant by Nature Serve (2004). It is considered stable throughout most of its native range although it is considered vulnerable in Alabama (NatureServe 2004). However,

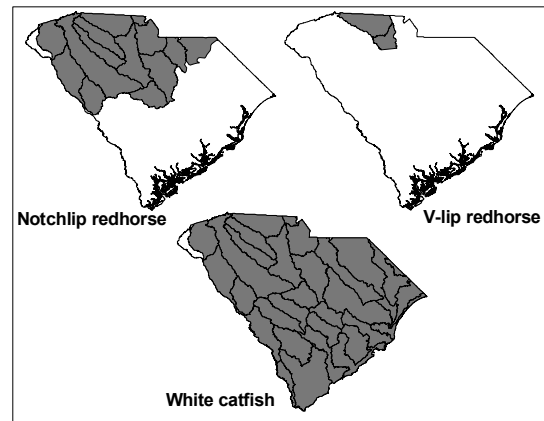
populations have greatly declined in the Neuse River, Cape Fear River, Pee Dee River (W. Starnes, pers. comm.) and Edisto River (W. McCord, pers. comm.) since the introductions of flathead catfish and blue catfish.

The striped bass is not listed in South Carolina and is currently considered stable (Warren et al. 2000) and secure or apparently secure (NatureServe 2000) throughout the majority of its native range. Although the species is currently appears stable, there are populations of concern in South Carolina. South Carolina is home to small reproductively isolated populations of striped bass that exhibit minimal anadromy and are generally restricted to their natal coastal rivers (Bulak et al. 2004). It is those small unique populations that warrant conservation concern in South Carolina.

POPULATION DISTRIBUTION AND SIZE

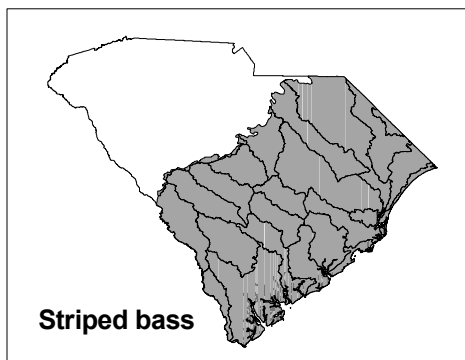
Distribution

The notchlip redhorse occurs on the Atlantic slope from Roanoke–Chowan drainage in Virginia to Altamaha River drainage, Georgia (NatureServe 2004). In South Carolina, the notchlip redhorse is found in the mainstem and larger tributaries of the Pee Dee, Santee and Savannah Rivers. It is generally restricted to the piedmont and upper coastal plain (SCDNR unpublished data).



The V-lip redhorse occurs on the Atlantic slope from Roanoke–Chowan drainage in Virginia to the Santee River drainage in South Carolina. In South Carolina, the species is restricted to the upper Broad River drainage, where it is rarely found (SCDNR unpublished data).

The white catfish is native to the major Atlantic slope drainages from Delaware to Florida. It is also found on the eastern Gulf slope in Alabama, Florida and Georgia. The white catfish has been introduced widely outside its native range. This species has been reported across the entire state of South Carolina (Nature Serve 2004), with few exceptions. White catfish are unlikely inhabitants of cold-water habitats of the northwestern portion of the state and are likely inhabitants of undocumented portions of the coastal plain and midlands of South Carolina (SCDNR unpublished data).



The striped bass's native range includes coastal rivers on the Atlantic Slope from the St. Lawrence River, Canada, to the St. Johns River, Florida, and in Gulf Slope drainages from western Florida to Lake Pontchartrain, Louisiana (NatureServe 2004). The striped bass has been introduced into rivers and reservoirs throughout the United States as it provides a valuable recreational fishery. The populations of conservation concern within South Carolina inhabit coastal rivers in the lower coastal plain including the

Savannah River, New River, Combahee River, Ashepoo River, Edisto River, Santee-Cooper Rivers, Black River, Lynches River, Pee Dee River, Little Pee Dee River and Waccamaw River.

Population Size and Trend

The notchlip redhorse is secure in North Carolina, although declining in the lower Neuse River, lower Cape Fear River, and lower Pee Dee River (W. Starnes, pers. comm.) and apparently secure in Virginia and Georgia. Population size and trend is under review in South Carolina (NatureServe 2004).

The V-lip redhorse is apparently secure in Virginia and North Carolina. In South Carolina, the abundance and trend of V-lip redhorse is under review. It is rarely found in South Carolina (SCDNR unpublished data).

White catfish populations in North Carolina and South Carolina coastal rivers have declined since the introduction of nonnative blue catfish and flathead catfish, (*Ictalurus furcatus* and *Pylodictis olivaris*, respectively) (W. Starnes, pers. comm.; SCDNR unpublished data).

Striped bass population trends within the coastal rivers are not well known. However, based on anecdotal evidence it appears that the coastal striped bass populations have declined. Coastal striped bass populations appear to be relatively small. A recent study of the Combahee River estimated the population of striped bass greater than 300 mm (12 inches) to be only 406 individuals (Bulak et al. 2004).

HABITAT AND NATURAL COMMUNITY REQUIREMENTS

The notchlip redhorse inhabits medium to large rivers of moderate gradient (NatureServe 2004). Within a stream, the notchlip redhorse is a pool-dweller. It can also be found in natural and artificial lakes (Jenkins and Burkhead 1994).

The V-lip redhorse inhabits rocky runs and silty to firm-bottomed pools within warm, medium-sized streams to large rivers of moderate or gentle gradient (Jenkins and Burkhead 1994). The V-lip redhorse is a benthic feeder and has been observed feeding in slow current, gravel-bottomed areas (NatureServe 2004).

White catfish inhabit warm ponds, reservoirs and medium to large rivers in freshwater and brackish water habitats (Jenkins and Burkhead 1994).

Striped bass inhabit medium to large rivers; they are also found in impoundments, where they have been introduced, but are often unable to complete their life cycle. They prefer to occupy areas with clean sandy bottoms, fine gravel and rock (NatureServe 2004). Adult striped bass have a thermal tolerance of 6 to 27° C (Merriman 1941), but seek temperatures between 18 to 25°C when available (Coutant and Carroll 1980; Crance 1984). During spawning, striped bass occupy shallow rocky and gravelly areas with strong turbulent water flow. Striped bass eggs are semibouyant; they drift and sink slowly requiring moderate current to keep the eggs from settling to the bottom and dying before they are hatched in one to three days (Scruggs 1955, Etnier and

Starnes 1993). Optimum water temperatures for successful striped bass egg hatching and survival is 17 to 18°C (Hassler et al. 1981).

CHALLENGES

Although the notchlip redhorse is currently stable throughout the majority of its range, habitat degradation such as deforestation and siltation represent a potential challenge to this species. The V-lip redhorse has a very limited distribution in South Carolina; any habitat loss or catastrophic pollution event in the upper Broad River drainage could lead to the extirpation of the species from South Carolina. Both species may experience impacts from exotic catfish species like blue and flathead catfish that likely prey on juvenile and adult redhorse (Guire et al. 1984; Bart et al. 1994); buffalo also adversely affect these species through competition (W. Starnes, pers. comm.).

Predation by and competition with introduced flathead catfish and blue catfish may negatively affect abundance of the white catfish and limit its distributions in portions of its range.

The major challenges to South Carolina's coastal striped bass populations include siltation, increased river water temperatures, hydrologic modification and over-exploitation. Clearing forests and riparian areas of coastal rivers and their tributaries have led to increased siltation and potentially warmer water temperatures. Warmer water temperatures may decrease the amount of summertime refuge habitat for striped bass and negatively impact reproduction. In the Combahee River, striped bass used areas with greater riparian overstory and associated cooler water temperatures as summer-time thermal refuges (Bjorogo et al. 2000). Current creel restrictions for coastal river striped bass (10 fish per day) may not be sufficient to protect these small striped bass populations, especially considering increased population growth in the area and the potential for greater harvest. Dams also negatively impact striped bass populations by disrupting migrations and altering thermal and hydrologic regimes. The presence of impoundments along the Savannah and Pee Dee Rivers may partially account for limited reproduction in those systems. Additionally, stocking nonendemic striped bass into coastal rivers may compromise the genetic integrity of these small isolated populations (Bulak et al. 2004).

CONSERVATION ACCOMPLISHMENTS

In order to protect the genetic integrity of small isolated striped bass populations, current South Carolina Department of Natural Resources (SCDNR) stocking policy allows only endemic stocks to be used to augment coastal river striped bass populations. Further, a ten-year moratorium on striped bass fishing in the lower Savannah River has allowed adult stocks to recover in that river; however, recruitment is still poor.

CONSERVATION RECOMMENDATIONS

- Determine statewide distribution and population status of the V-lip redhorse, the notchlip redhorse, the white catfish and the striped bass with statewide stream surveys.
- Describe life history and habitat requirements of the V-lip redhorse, the notchlip redhorse, the white catfish and the striped bass.

- Identify critical habitats and areas with healthy populations of the V-lip redhorse, the notch-lip redhorse, the white catfish and the striped bass. Protect these areas, once identified.
- Investigate the existence of the V-lip redhorse in the Pee Dee River.
- Identify and monitor key striped bass habitats like thermal refuges and spawning sites.
- Assess striped bass reproductive potential in the coastal rivers.
- Determine reasons for lack of striped bass recruitment in the Savannah and Pee Dee River Systems.
- Protect critical habitats from future development and further habitat degradation by following best management practices and protecting and purchasing riparian areas.
- Promote land stewardship practices through educational programs both within critical habitats with healthy populations and other areas that contain available habitat.
- Encourage responsible landuse planning.
- 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.
- Educate motor vehicle operators of the negative affects of crossing streams at multiple locations and using stream bottoms as trails.
- Avoid further spread of exotic catfish species like blue and flathead catfish by educating landowners, fishermen and the general public to the discontents of stocking non-native species.
- Augment coastal striped bass populations with endemic strains, as needed.

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. In the event that more protective BMPs are implemented, population studies of these fish could assist in determining the effectiveness of those measures. An increase in coastal striped bass populations within the state would also indicate that restoration and habitat protections were successful.