Ohio Shrimp

Macrobrachium ohione

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DESCRIPTION

Taxonomy and Basic Description

The Ohio shrimp, *Macrobrachium ohione* (Smith), is a member of the family Palaemonidae, characterized by having the first two pairs of legs chelate, the second pair larger than first, and the carpus of the second leg not subdivided. The Ohio shrimp is characterized by having a hepatic spine present and second pereopods enlarged and greatly elongated. The rostrum is curved, has up to 13 teeth but has a toothless daggerlike tip. The Ohio shrimp may grow up to 10 cm (4 inches) long. The color is pale gray flecked with small blue spots (Williams 1984).

Status

The population of Ohio shrimp in South Carolina is not listed as being threatened or endangered; however, in parts of its range, the Ohio shrimp is listed as rare and of long-term concern (Missouri Natural Heritage Program 2004). In some parts of its range, such as Louisiana, the population is abundant enough to provide a fishery.

POPULATION DISTRIBUTION AND SIZE

This river shrimp occurs in lower salinity and tidal freshwater areas in South Carolina. Its full range extends from North Carolina into Florida. The Ohio shrimp was once common in the Mississippi river below St. Louis, where commercial fisheries for this species previously existed near Chester and Cairo, Illinois. However, Ohio shrimp have declined dramatically in the Mississippi, most likely due to channelization of the river (Barko and Hrabik 2004). The size of the population in South Carolina is unknown.

HABITAT AND NATURAL COMMUNITY REQUIREMENTS

Ohio shrimp apparently prefer low velocity water (Conaway and Hrabik 1997); however, open side channels, a preferred habitat of Ohio shrimp, have flow during normal river elevations (Barko and Herzog 2003). Ohio shrimp prefer borders of the main channel, especially when the borders are flooded and plant and animal material are available for foraging (Truesdale and Mermilliod 1979). Ohio Shrimp have been reported to have greater abundance in areas with suspended particulate matter, which may be a predator avoidance response. Ohio shrimp occupy low visibility physical habitats that are also occupied by predatory fishes, such as flathead catfish, a species that is not native to South Carolina (Barko and Herzog 2003). Little is known about the life history of the Ohio shrimp in South Carolina. In other areas, it has been reported to receive reproductive cues from spring floods and uses flooded terrestrial habitat for reproduction (Hobbs 2001).

According to Ortman (1902), the genus *Macrobrachium* has probably only recently evolved migratory behavior into fresh water. Biological characteristics indicative of this relatively recent adaptation include high hemolymph osmo-ionic concentrations, tolerance of high salinities, dependence on saline water for larval development with many larval stages and migratory behavior (McNamara 1987).

CHALLENGES

Ohio Shrimp may have declined as a result of waterway channelization and habitat loss in parts of its range. Changes in river physiography that fragment main channel borders and isolate side channels during moderate to low river elevation can reduce Ohio shrimp populations (Logsdon 1993; Hobbs 2001; Barko and Herzog 2003). In parts of its range, reduced connectivity with the floodplain, because of levees, closing structures and wing dikes, has also contributed to Ohio shrimp declines.

For many years, wetlands were frequently filled, drained, polluted or used for dumping grounds. In the past two decades, 84 percent of wetlands losses have occurred in the southeastern United States (SCDHEC 1998). The losses in South Carolina do not appear to be as extensive as in other states. Officials estimate that South Carolina has lost about 27 percent of its wetlands since the mid-1700s (Dahl 1990). About 90 percent of the state's wetlands are freshwater, which is the habitat type utilized by the Ohio shrimp. Freshwater wetlands occur throughout South Carolina, but are most abundant in the central and lower areas of the state. Freshwater marshes are most prevalent along the lower portions of the Waccamaw, Pee Dee, Santee, Cooper, Edisto and Savannah rivers.

Despite recent legislation, national progress on improving protection for wetlands has not occurred as quickly as needed, and wetlands losses have continued. This is because the mitigation process does not require that the "taker" replace the lost wetland with a wetland of equal quality. This type of mitigation results in "replaced" wetlands that do not necessarily have the same hydrologic features or wetland functions as the lost wetland. Often, a "taken" wetland will be within a system of hydrologic flow that cleanses water and supports abundant wildlife, while the replaced wetland does not perform the same ecosystem functions (E. Ciuzio, SCDNR, pers. comm. March, 2005).

CONSERVATION ACCOMPLISHMENTS

In recent times, Americans have become aware of the importance and value of wetland resources, which has led to legislative protection and restoration proposals across the country. The benchmark act, The North American Wetland Conservation Act of 1989 (NAWCA) established a "no net loss" policy for wetlands. That means any wetlands lost through anthropogenic activities, such as filling for development, must be matched by restoration, expansion or replacement of an equal amount of wetlands. Despite the limitations of NAWCA, this law has helped to slow the loss of wetlands in the United States, thus protecting habitat for Ohio shrimp.

CONSERVATION RECOMMENDATIONS

- Examine the ecological role of Ohio shrimp in riverine systems in South Carolina.
- Establish baseline data on population size, distribution and habitat requirements of Ohio shrimp in South Carolina waters.
- Examine how anthropogenic river modifications and reduced floodplain connectivity may impact Ohio shrimp as well as other riverine species.
- Protect tidal freshwater habitats in South Carolina from development and modifications to natural freshwater flow regimes by partnering with the appropriate permitting agency to provide better technical information about the potential negative effects of development on aquatic ecosystems.
- Encourage citizens to donate wetland areas to a land trust that will protect it in perpetuity.
- Partner with the United State Army Corps of Engineers to restore natural hydrologic regimes where possible and reduce further modifications.
- Consider water flow impacts on Ohio shrimp when renewing licenses for river dams.
- Institute and implement a process of statewide or regional wetland mitigation banking with the goal of planning restoration projects such that “mitigation” wetlands function more like the ones they are meant to replace.

MEASUREMENT OF SUCCESS

By monitoring populations of Ohio shrimp, along with other tidal freshwater species, annual and seasonal trends in abundance can be detected. By working proactively, SCDNR will be able to manage a stable population of Ohio shrimp as well as other species that utilize the same habitat. The measurement of success will be “no net loss” of high quality wetlands.

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