Bridle Shiner

Notropis bifrenatus

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DESCRIPTION

Taxonomy and Basic Description

The Bridle Shiner is a member of the cyprinid family (minnows) and currently resides in the genus *Notropis*. With 71 species, *Notropis* is the second largest genus of freshwater fishes in North America (Rohde et al 1994). Bridle Shiners are relatively small, reaching a maximum total length of about 60 mm (2.3 in.). A prominent black lateral stripe extends from the tip of the snout to the tail fin. The back is straw-colored while the sides of the fish are silver with blue-green iridescence. Breeding males develop light yellow to bright yellow-gold color on the lower sides of their bodies and faint yellow fins (Jenkins and Burkhead 1994).

Status

The Bridle Shiner has received legal status as a fish of special concern in both South Carolina and North Carolina. In North Carolina, the Bridle Shiner is considered critically imperiled (S1) and is currently not ranked in South Carolina (SNR) (NatureServe 2013). It carries no federal status but is listed as imperiled (S2) or possibly extinct (SH) in 6of the 15 states that comprise its historic range (NatureServe 2013). In a recent assessment of North American fishes, the Bridle Shiner was identified as a species vulnerable to imperilment (Jelks et al. 2008). Globally, the Bridle Shiner is considered vulnerable (G3) (NatureServe 2013).

POPULATION SIZE AND DISTRIBUTION

The Bridle Shiner has a widespread but spotty distribution. Globally, it occurs in the Atlantic drainages of Eastern North America from western Lake Ontario east to Maine and south to South Carolina. Within South Carolina, the only known population occurs in Lake Marion (F. Rohde, pers. comm.).

The Bridle Shiner populations are severely fragmented with gaps in excess of 200 km (124.3 mi.) between known localities. Furthermore, these populations are declining throughout the species' range (NatureServe 2013). Once common in Pennsylvania (Cooper 1983), its distribution has been reduced to a single extant population (Criswell1998). The Bridle Shiner is rare or declining in Massachusetts (Chandler et al. 1998), Connecticut, Delaware, Maine, New York, North Carolina, Rhode Island, South Carolina, and Vermont (Shervinskie 1998). In Virginia, the Bridle Shiner is somewhat successful in the James River drainage but is likely extirpated from four other drainages (Jenkins and Burkhead 1994). The Bridle Shiner was not collected at any randomly selected wadeable stream sites in the South Carolina Stream Assessment (2006-2011).

HABITAT OR NATURAL COMMUNITY REQUIREMENTS

The Bridle Shiner inhabits the quiet areas of warmwater streams, swamps, and lakes with clear or slightly stained—but not turbid—water. This species is most often associated with abundant aquatic vegetation as these areas are used for feeding and breeding. It is generally found over sand, mud, or gravel substrates. The Bridle Shiner can be found in tidal and slightly brackish water in the southern portion of its range (Burkhead and Jenkins 1991). In South Carolina, it is only found in the shallow lacustrine areas of Lake Marion (F. Rohde, pers. comm.).

CHALLENGES

The Bridle Shiner, along with many other fishes, is adversely affected by habitat alterations. Increased water turbidity may hamper its ability to feed by sight. Additionally, increased turbidity may inhibit the growth of submerged aquatic vegetation that is essential for Bridle Shiner feeding, reproduction, and cover (Jenkins and Burkhead 1994). Agricultural runoff may also negatively impact its habitat (Burkhead and Jenkins 1991). In South Carolina, limited distribution of this species makes it extremely vulnerable to imperilment.

CONSERVATION ACCOMPLISHMENTS

Bridle Shiner populations are currently protected as part of the Santee Wildlife Refuge.

Educational materials have been developed in order to raise public awareness of nongame species and their ecological importance to the natural history of South Carolina's aquatic habitats, including:

- The Reel Art program creates a topic for secondary school students and judges the artists' submissions (e.g. a list of the Piedmont Fishes of SC to select from as subjects for drawing or painting).
- We compiled information and photographs for the development of nongame fish description web pages which are currently in development.
- We developed the Blackwater River Guide and interactive Powerpoint.
    - http://www.dnr.sc.gov/education/pdf/BlackwaterInteractivePoster.pdf
    - http://www.dnr.sc.gov/education/pdf/BlackwaterRivEdGuide.pdf
- We developed and printed the Fish Species of Concern Coloring Book (2009).
    - http://www.dnr.sc.gov/aquaticed/pdf/SCFishesofConcernColoringBook.pdf

CONSERVATION RECOMMENDATIONS

- Describe the life history and habitat requirements for Bridle Shiner.
- Determine the statewide distribution and population status for Bridle Shiner with targeted surveys.
- Survey Lake Marion and its tributary streams to identify the presence of additional Bridle Shiner populations and verify its existence in Lake Marion.
- Conduct genetic assessments to determine the appropriate taxonomy for Bridle Shiners.
- Explore reasons for the decline of Bridle Shiners in South Carolina.

- Protect critical habitats for Bridle Shiner from future development and further habitat degradation by following Best Management Practices (BMPs) and protecting and purchasing riparian areas.
- Promote land stewardship practices through educational programs both within critical habitats with healthy populations and in other areas that contain available habitat for Bridle Shiner.
- Encourage responsible land use planning.
- Consider this species' needs when participating in the environmental permit review process.
- Continue to develop educational materials in order to raise public awareness of nongame fish species and their ecological importance to the natural history of South Carolina's aquatic habitats.
- Educate off-road motor vehicle operators on the negative effects of crossing streams at multiple locations and using stream bottoms as trails.

MEASURES OF SUCCESS

Determining the distribution, life history, habitat needs, and Southeastern population structure and trends would represent a measure of success for this species. Methods that protect water quality are also likely to protect this species and others. In the event that more protective BMPs are implemented, population studies of these fish could assist in determining the effectiveness of those measures.

LITERATURE CITED

Burkhead, N.M. and R.E. Jenkins. 1991. Fishes. Pp 321-409 *In*: Virginia's Endangered Species: Proceedings of a Symposium, K. Terwilliger (coordinator). McDonald and Woodward Publishing Company. Blacksburg, Virginia.

Chandler, Mark, L. S. Kaufman, and Karsten Hartel. 1998. "Proposal to the Massachusetts Division of Fisheries and Wildlife to Add." *Delete, or Change the Classification of Species Listed Under the Massachusetts Endangered Species Act: Bridle Shiner* (1998).

Cooper, Edwin L. 1983. *Fishes of Pennsylvania and the Northeastern United States*. PSU Press, University Park, PA. 243 pp.

Criswell, R.W. 1998. Status of the bridle shiner *Notropis bifrenatus* (Cope) and ironclad shiner *Notropis chalybaetus* (Cope) in Pennsylvania. Unpublished report to the Pennsylvania Game and Fish Boat Commission. Bellefonte, PA.

Jelks, H.L., S.J. Walsh, N. M. Burkhead, S. Contreras-Balderas, E. Díaz-Pardo, D.A. Hendrickson, J. Lyons, N.E. Mandrak, F. McCormick, J.S. Nelson, S.P. Platania, B.A. Porter, C.B. Renaud, J.J. Schmitter-Soto, E.B. Taylor, and M.L. Warren, Jr. 2008. Conservation status of imperiled North American freshwater and diadromous Fishes. Fisheries 33 (5):372-407.

Jenkins, R.E., and N.M. Burkhead. 1993. Freshwater Fishes of Virginia. American Fisheries Society. Bethesda, Maryland. 1079 pp.

NatureServe. 2013. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: March 26, 2013).

Rohde, F.C., R.G., Arndt, D.G. Lindquist and J.F. Parnell. 1994. Freshwater Fishes of the Carolinas, Virginia, Maryland, and Delaware. The University of North Carolina Press. Chapel Hill, North Carolina. 222 pp.

Shervinskie, T. 1998. Marshalls Creek (501E) Stream Survey Report. Unpublished report to the Pennsylvania Fish and Boat Commission, Division of Environmental Services.