

## Brother Spike

### *Elliptio fraterna*

Contributor (2005): Jennifer Price (SCDNR)

Reviewed and Edited (2012): William Poly (SCDNR)

#### DESCRIPTION

##### Taxonomy and Basic Description

The shell of the Brother Spike is elongate, rather thin, and subrhomboid; the anterior end is regularly rounded, the posterior end blunt, the ventral margin is mostly straight, and the dorsal margin straight or slightly curved. There is a well-developed posterior dorsal ridge that becomes double near the posterior margin. The outer surface of the shell is smooth and shiny, reddish-brown to yellowish, often with fine green rays that become obscured with age. The inner surface varies from white to pink, salmon, and purple. The Brother Spike reaches 65 mm (2.6 in.) in length (Bogan and Alderman 2004, 2008).



from Bogan and Alderman (2008)

##### Status

The Brother Spike is listed as a state endangered species in South Carolina and is declining in abundance and distribution. It is assigned a rank of critically imperiled (S1) in both South Carolina and Georgia. This species has a global rank of critically imperiled (G1) (NatureServe 2011). Recently, the Brother Spike was included on a list of 404 species being petitioned for consideration as candidates for federal protection (USFWS 2011).

##### POPULATION SIZE AND DISTRIBUTION

This species appears to be endemic to the Savannah River Basin and has been found in South Carolina and Georgia. It seems to have disappeared from many former locations in the Savannah (Taxonomic Expertise Committee 2004).



##### HABITAT AND NATURAL COMMUNITY REQUIREMENTS

The Brother Spike tends to occur most often in large rivers but has also been found in Turkey Creek in South Carolina in the Savannah River Basin (Taxonomic Expertise Committee 2004). It is reported to inhabit sand bars in swift flowing sections of streams and rivers (Johnson 1970).

##### CHALLENGES

All of the general challenges to mussels are likely to apply to the Brother Spike, although it is unknown how the challenges affect this species. Observations suggest that this species is sensitive to channel modification, pollution, sedimentation, and low oxygen conditions, but the relative sensitivity of this species to these threats compared to other species is unknown.

#### CONSERVATION ACCOMPLISHMENTS

The Brother Spike has been listed as an endangered species in South Carolina.

#### CONSERVATION RECOMMENDATIONS

- Conduct genetic analyses to determine the relationship between the Brother Spike and *Elliptio congarea*.
- Conduct surveys to determine the current range and status of the Brother Spike.
- Protect critical habitats for the Brother Spike 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 in other areas that contain available habitat for the Brother Spike.
- Encourage responsible land use planning.
- Consider this species' needs when participating in the environmental permit review process.
- Educate off-road motor vehicle operators of the negative effects of crossing streams at multiple locations and using stream bottoms as trails.
- Conduct further research to determine the degree of sensitivity of the Brother Spike to various point and non-point sources of pollution and land use impacts.

#### MEASURES OF SUCCESS

Resolving taxonomic questions regarding the relationship between the Brother Spike and *Elliptio congarea* will be one measure of success. Determining the extent of its distribution will be another. Persistence of identified populations and an increase in population where they are currently very rare will be considered indicative of success.

#### LITERATURE CITED

Bogan, A.E. and J.M. Alderman. 2004. Workbook and key to the freshwater bivalves of South Carolina. i-ii + 1-64 pp. + 5 pls.

Bogan, A.E. and J.M. Alderman. 2008. Workbook and key to the freshwater bivalves of South Carolina (Revised Second Edition). i-ii + 1-66 pp. + 5 pls.

Johnson, R.I. 1970. The systematics and zoogeography of the Unionidae (Mollusca: Bivalvia) of the southern Atlantic Slope Region. Bulletin of the Museum of Comparative Zoology. 140(6):263-449.

NatureServe. 2011. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>.

United States Fish and Wildlife Service (USFWS). 2011. Endangered and threatened wildlife and plants; partial 90-day finding on a petition to list 404 species in the southeastern United States as endangered or threatened with critical habitat. *Federal Register* 76: 59836–59862.