

Variable Spike

Elliptio icterina complex

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DESCRIPTION

Taxonomy and Basic Description

This is a large widespread complex including many species that were synonymized by Johnson (1970). The former synonyms of *E. icterina*, *E. hepatica*, *E. lugubris*, and *E. raveneli*, are currently recognized by some but not all taxonomists. The taxonomy of all species in this complex is somewhat uncertain, so they will be treated together here. The variable spike has an oblong, subelliptical, or subrhomboid shaped shell with a prominent posterior ridge. The exterior surface is smooth, shiny, and greenish yellow to tawny brown, and the interior surface is white and often silvery (Bogan and Alderman 2004).



Status

As currently classified, the variable spike is one of the more common freshwater mussel species. However, because populations of multiple species appear to be combined under one name, the distributions of these separate species are likely to be more restricted. Further, some of the synonymized species may actually be rare. NatureServe (2005) currently identifies the variable spike as having a global ranking of apparently stable but of questionable taxonomy (G4Q). This species is not ranked in South Carolina. Members of the *Elliptio icterina* complex that may be separate species are currently ranked as follows: *Elliptio hepatica* is vulnerable to imperiled globally (G2G3); *Elliptio raveneli* is vulnerable to apparently stable globally (G3G4); and *Elliptio lugubris* is critically imperiled to imperiled globally (G1G2).

POPULATION DISTRIBUTION AND SIZE

The variable spike appears to be widespread within South Carolina. It is difficult to determine the historic distribution of this species because several previously recognized species have been grouped together. Also, several species were once grouped as *Elliptio icterina* and are now recognized as separate species. Therefore old records of species occurrence are difficult to interpret.

HABITAT AND NATURAL COMMUNITY REQUIREMENTS

The variable spike has been found in a variety of habitats including both slow flowing streams and swamps and faster flowing streams and rivers. It can be found in both clear and tannic water, and is found on a variety of substrates, including sand, gravel, bedrock, mud, and detritus (T. Savidge, pers. comm., e-mail message January 25, 2005).

CHALLENGES

Preliminary genetic and morphological investigation suggests that this species complex may contain several species (Johnson 1970; A. Bogan, pers. comm. 2005); some of these may be common while others may be rare. Observations suggest that species in this complex may be sensitive to channel modification, pollution, and low oxygen conditions, but we do not know how the relative sensitivity of this species to these challenges compares to other species. Some members of the complex appear to be more tolerant of moderate amounts of siltation since they have been found in fairly silty habitats (Taxonomic Expertise Committee 2004). All of the general challenges to mussels might apply to species in this complex, although we do not know how specific actions affect this species.

CONSERVATION ACCOMPLISHMENTS

There are no significant conservation accomplishments for the variable spike complex at this time.

CONSERVATION RECOMMENDATIONS

- Conduct genetic analyses across the range of the variable spike complex to try to determine the relationship between species that may be in this complex, and attempt to identify morphological characters that can be used to distinguish between the species.
- If multiple species are determined to be in the complex, conduct extensive studies to determine the ranges and habitat requirements of each as well as their sensitivity to land use and aquatic pollutants.
- Protect critical habitats for the variable 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 other areas that contain available habitat for the variable spike.
- Encourage responsible land use planning.
- Consider species needs when participating in the environmental permit review process.

MEASURES OF SUCCESS

Resolving taxonomic issues regarding the variable spike complex will be the primary measure of success.