

Carolina Darter*Etheostoma collis*

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**DESCRIPTION****Taxonomy and Basic Description**

The Carolina Darter is a member of the perch family, Percidae. It is classified in the subgenus *Hololepis*, which contains 3 species in South Carolina (Rohde et al. 1994). At one point it was incorrectly called the Saluda Darter. The Carolina Darter is a resident of the Yadkin, Pee Dee, and Catawba drainages in North and South Carolina (Cloutman 1979). Carolina Darters reach a length of 60 mm (2.4 in.) (Rohde et al. 1994). The fish has a small head and mouth with a highly arched, incomplete lateral line (Kuehne and Barbour 1983). The brown-spotted sides are marked with a median dark stripe that breaks into blotches on the peduncle (Eddy and Underhill 1979). A primary basicaudal spot has two spots of lesser intensity above and below (Rohde et al. 1994). Breeding males do not develop bright colors but may have breeding tubercles on the pelvic fin spine and rays as well as on all anal fin rays (Kuehne and Barbour 1983).

Status

The Carolina Darter has received legal status as a federal species of concern and a species of concern in South Carolina. It was identified as a species vulnerable to imperilment in a recent assessment of southeastern freshwater fishes (Warren et al. 2000). The species is considered vulnerable (S3) in North Carolina, imperiled (S2) in Virginia, and is currently not ranked (SNR) in South Carolina (NatureServe 2013). It was also considered vulnerable in a recent assessment of North American freshwater fishes (Jelks et al. 2008). The Carolina Darter is considered vulnerable (G3) globally (NatureServe 2013).

POPULATION SIZE AND DISTRIBUTION

The Carolina Darter exists only in the Piedmont region from south-central Virginia through North Carolina into north-central South Carolina. The range in South Carolina is restricted to the Santee River Basin (Rohde et al. 2009). This species is known from a few dozen localities in Virginia, North Carolina, and South Carolina but has not been collected from several of those locations in recent surveys (NatureServe 2013). Jenkins and Burkhead (1994) reported 6 to 8 locations for this species in Virginia, but some of these are believed to be extirpated. Based on South Carolina Stream Assessment (2006-2011) data, the mean statewide density estimate for the Carolina Darter in wadeable streams was 0.16 (95% confidence interval: 0.06 – 0.27) per 100 m².

HABITAT OR NATURAL COMMUNITY REQUIREMENTS

The Carolina Darter inhabits small- to moderate-sized streams in areas of low current velocity. Habitat substrates preferred by this species are usually characterized by mud, sand, and sometimes bedrock. This darter seems to be tolerant of fine sediments covering the substrate it inhabits (Kuehne and Barbour 1983; Rohde et al. 1994).

CHALLENGES

Geographic isolation of the Carolina Darter makes it extremely vulnerable to development, pollution and habitat alterations. Due to the precarious status throughout its range, any environmental threat should be a concern to the species' well being. Conservation efforts within South Carolina are critical to the global conservation of this species.

CONSERVATION ACCOMPLISHMENTS

South Carolina Stream Assessment data have facilitated the calculation of standardized abundance (density) estimates for this species at multiple spatial strata including statewide, river basin, level-IV ecoregion, and "ecobasin" (ecoregion x river basin). These estimates, for the first time, provide an objective measure of current population status that will serve as a baseline for following future population trends and gauging the effectiveness of conservation actions.

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

- Use South Carolina Stream Assessment decision-support GIS modeling tools to identify levels and spatial distributions of critical habitat factors to sustain the species in geographic areas of interest.
- Use South Carolina Stream Assessment decision-support GIS modeling tools to identify priority regions and watersheds at greatest risk of decline in stream integrity.
- 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 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 species and their ecological importance to the natural history of South Carolina's aquatic habitats.
- Educate motor vehicle operators of the negative effects of crossing streams at multiple locations and using stream bottoms as trails.

MEASURES OF SUCCESS

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

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