

High Conservation Priority – Blue Ridge and Piedmont Species

Carolina Fantail Darter *Etheostoma flabellare brevispina*

Smoky Sculpin *Cottus bairdii* complex

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DESCRIPTION

Taxonomy and Basic Description

The Carolina fantail darter is a member of the family Percidae. This diverse family contains approximately 150 species of darters, all of which are found in rivers, lakes, swamps and springs of North America (Kuehne and Barbour 1983). The Carolina fantail darter belongs to the genus *Etheostoma*, the largest genus of North American fishes. The Carolina fantail darter is the only South Carolina representative of the subgenus *Catonotus*. The subspecies *E. f. brevispina*, identified from Virginia, North Carolina and South Carolina has been named “Carolina” fantail darter (Warren et al. 2000). Blanton (2001) hypothesized possible species level differentiation of *E. f. brevispina* due to marked differences in morphology and pigmentation. The adult fantail darter ranges from 45 to 95 mm (1.8 to 3.7 inches) in total length (Jenkins and Burkhead 1993). As is typical of other members of the subgenus *Catonotus*, the Carolina fantail darter has a deep caudal peduncle, frenum, closely set pelvic fins and broadly joined gill membranes. Additionally, this fish is characterized by a spiny dorsal fin comprised of seven spines with enlarged tips. The Carolina fantail darter usually has seven dark bars on the side against light body coloration (Page and Burr 1991; Rohde et al. 1994).



The smoky sculpin is a member of the family Cottidae, which is a large family of mostly northern-hemisphere marine fishes found around the world. The genus *Cottus* is strictly confined to freshwaters of North America and Eurasia (Robins 1961, Page and Burr 1991). The taxonomy of the genus is uncertain at present. The name “smoky” sculpin has been used to reference the *C. bairdii*-like form occurring in South

Carolina, which may be a subspecies or potential new species; however, the formal description has not yet been published (Jenkins and Burkhead 1993, Warren et al. 2000). The *C. bairdii* complex is widespread, occurring in the eastern half of North America from arctic Canada southward where cool streams and rocky substrates are present, as well as in western North America on both sides of the continental divide. The adult smoky sculpin ranges in total length from 58 to 114 mm (2.3 to 4.5 inches). As is typical of other members of the genus *Cottus*, the smoky sculpin has a large head and mouth, two dorsal fins (the first is spiny and the second is soft-rayed) and three reduced preopercular spines. This sculpin has a complete lateral line, or

nearly so, and well-developed palatine teeth. Red marginal and black basal bands in the spinous dorsal fin are found on males. Pigmentation is highly variable, with body background color ranging from coppery brown to slate gray, approaching black in nuptial males, with dark brown to black mottling on sides and back (Robins 1961; Page and Burr 1991; Jenkins and Burkhead 1993).

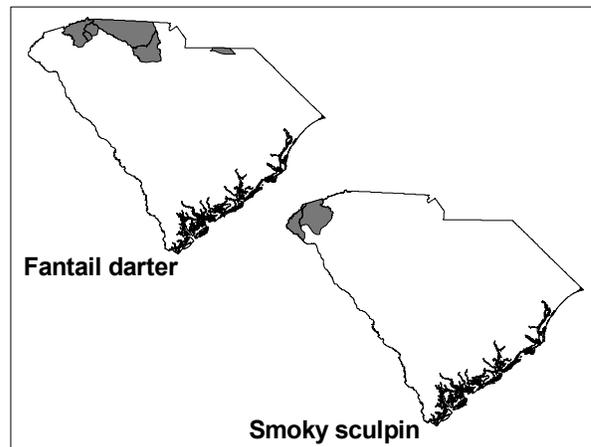
Status

The Carolina fantail darter is considered globally secure but critically imperiled (S1) in South Carolina (NatureServe 2004). Warren et al. (2000) listed the global status of Carolina fantail darter as currently stable within its range. The South Carolina Department of Natural Resources (SCDNR) lists the Carolina fantail darter as a species of special concern. The smoky sculpin is not listed in South Carolina. Warren et al. (2000) listed the global status of smoky sculpin as currently stable within its range.

POPULATION DISTRIBUTION AND SIZE

Distribution

The fantail darter is widely distributed as a complex of closely related forms that are in need of taxonomic resolution, with some variants perhaps warranting species status (Blanton 2001). It is found from the Carolinas northward to Great Lakes tributaries from New York to Minnesota and south in the Mississippi basin to the Ozarks and northern Alabama. The Carolina fantail darter form is endemic to the piedmont and Blue Ridge sections of the upper Pee Dee and Santee River drainages in South Carolina (Warren et al. 2000).



The smoky sculpin is endemic to the southern portion of the Blue Ridge physiographic region (Warren et al. 2000). In South Carolina, it is found in the extreme upper Savannah River drainage, primarily in the Blue Ridge ecoregion; however, peripheral populations extend down onto the inner Piedmont in a few locations. The Savannah populations are thought to have colonized the basin due to stream capture of Tennessee drainages (Jenkins et al. 1971). Outside of South Carolina, the species occurs in the Blue Ridge portions of north Georgia, east Tennessee, and western North Carolina (Jenkins and Burkhead 1993).

Population Size and Trend

The fantail darter complex is widespread and common in eastern North America, and the *brevispina* form is considered secure in North Carolina. Little is known of population size or trends in South Carolina, although the species can be commonly collected in the upper Broad River basin (SCDNR unpublished data). Kings Creek in York County, South Carolina and its tributaries contain healthy Carolina fantail darter populations (SCDNR unpublished data).

The smoky sculpin in South Carolina is only found in the extreme upper Savannah River drainage, primarily the Chattooga River and tributaries. Populations in the Chattooga are locally abundant and appear to be currently stable based on yearly fish population sampling (SCDNR unpublished data), and future population viability is likely, particularly in light of the protected status afforded the Chattooga as a Wild & Scenic River.

HABITAT AND NATURAL COMMUNITY REQUIREMENTS

The Carolina fantail darter inhabits gravel or rubble riffles in creeks and small- to medium-sized rivers where stronger currents exist. Rocky substrates are important to its benthic feeding habits and spawning behavior.

The smoky sculpin inhabits clear, cold to cool headwaters, creeks, springs and small montane rivers of high to moderate gradient. Substrates are rubble and gravel, which are important to its benthic feeding habits and crevice spawning behavior.

CHALLENGES

The Carolina fantail darter and the smoky sculpin are currently stable throughout their range. The limited distribution of these species within South Carolina makes them vulnerable to impacts from land development, deforestation, loss of riparian cover, siltation and hydrologic alterations (channelization and impoundment construction). Because of their limited distribution within South Carolina, such habitat alteration could extirpate them from the state, although this appears a more likely threat to the fantail darter than to the sculpin. This is because the area of core sculpin abundance is a protected area, the Wild & Scenic Chattooga River.

CONSERVATION ACCOMPLISHMENTS

The core area of smoky sculpin abundance is protected by the Wild and Scenic Chattooga River.

CONSERVATION RECOMMENDATIONS

- Identify additional populations of Carolina fantail darters and smoky sculpins and determine the status of known populations through targeted surveys. Conduct landscape level surveys to identify critical habitats and areas with healthy populations.
- Describe life history and habitat requirements for both Carolina fantail darters and smoky sculpins.
- Conduct genetic studies of the Carolina fantail darter to resolve taxonomic questions regarding differentiation of Santee and Pee Dee populations and to resolve taxonomic question regarding differentiation of Savannah populations of the smoky sculpin.
- Identify and protect areas with healthy populations and intact critical habitat for both the Carolina fantail darter and the smoky sculpin.
- Promote land stewardship practices through educational programs both within critical habitats with healthy populations and other areas that contain available habitat.
- Consider species needs when participating in the environmental permit review process.
- Encourage responsible landuse planning.

- Develop a Non-Game Fishes of South Carolina poster and other 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.

MEASURES OF SUCCESS

Determining the distribution, life history, habitat needs and southeastern population structure and trends would represent a measure of success for these species. Methods that protect water quality are also likely to protect most of these species. Genetic resolution of the status of the both species will allow for more specific management protocols.