Moderate Conservation Priority – Coastal Plain Species

Bluefin Killifish *Lucania goodei*
Banded Killifish *Fundulus diaphanus*
Pugnose Minnow *Opsopoeodus emiliae*
Mud Sunfish *Acantharchus pomotis*

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DESCRIPTION

Taxonomy and Basic Description

The bluefin killifish is a member of the family *Fundulidae* (topminows). The fundulids occupy a variety of freshwater and brackish water habitats. As the name topminnow suggests, the members of this family are adapted to life near the surface with excellent vision and eyes that are oriented upward. The bluefin killifish reaches a length of 49 mm (1.9 inches). This species looks similar to members of *Fundulus* but with a more laterally compressed body. There is a black stripe on the side from the snout to the base of the tail. The body is grayish white. The dorsal and anal fins of males contain a significant amount of blue and are edged with black; fins of females are clear (Rohde et al. 1994).

The banded killifish is a member of the large genus *Fundulus*, in the family Fundulidae (topminnows). Two subspecies are recognized, *F. d. diaphanus* and *F. d. menona*. The banded killifish reaches a length of 130 mm (5.1 inches). The fundulids are commonly used as bait (Jenkins and Burkhead 1993) and are important for mosquito control (Rosen 1973). Hobbyists also keep many members of the family in aquaria. The banded killifish is distinguished from others in the genus by a more elongate body, longer and more flattened snout, small scales and numerous narrow bars. Bars are darker than the background color in females and silvery in males (Rohde 1994 et al.).

Two subspecies of pugnose minnow are recognized, *O. e. peninsularis* and *O. e. emiliae*. This is a delicate-looking minnow with a maximum length of about 5 cm (2 inches). It has a distinctive small mouth that is nearly vertical and a blunt snout. Head on, the mouth resembles an inverted U. The scales of the back and sides are edged in black, creating a crosshatched pattern. Overall coloration is dusky yellow, silvery on the belly and with a black stripe on the side from head to base of the tail (Rohde 1994 et al.).

The mud sunfish is a small secretive member of the family Centrarchidae and the only member of the *Acantharchus* genus. The 30 species of this family include the sunfishes, crappies and black basses and represent the second largest fish family indigenous to North America (Jenkins and Burkhead 1993). The mud sunfish is a chucky centrarchid with large eyes and mouth and a rounded caudal fin. It is olive green in color with 3 to 6 dark brown stripes on its side (Rohde et al. 1994). It is the only sunfish with cycloid scales (Rohde et al. 1994). Adult mud sunfish reach total lengths of about 218 mm (8.5 inches).

Status

The bluefin killifish is listed as a species of special concern in North Carolina and South Carolina and listed as unusual in Georgia. The bluefin killifish is considered critically imperiled (S1) in South Carolina, Georgia, Alabama and North Carolina (NatureServe 2004). In Florida, the only other state where it occurs, its status is under review, but is reported as common to abundant (NatureServe 2004).

The banded killifish is listed as a fish of special concern in South Carolina, but considered secure or apparently secure throughout most of its range (NatureServe 2004). It is classified as critically imperiled (S1) in locations on the fringes of its range, including South Carolina, Illinois, South Dakota, Manitoba and Newfoundland (NatureServe 2004).

The pugnose minnow has a large range in the lowlands extending from the southeastern U.S. to the southern Great Lakes region. It is common, although sometimes spotty throughout most of its range, but is becoming less common in some areas (NatureServe 2004).

The mud sunfish is currently considered stable throughout its range (Warren et al. 2000). However, it is considered at least vulnerable to imperilment in five (Delaware, Florida, Georgia, Maryland and Virginia) of the ten states where it occurs. It is presumably extirpated from New York and possibly extirpated from Pennsylvania (NatureServe 2004). It is unranked in South Carolina and apparently secure in North Carolina and New Jersey (NatureServe 2004).

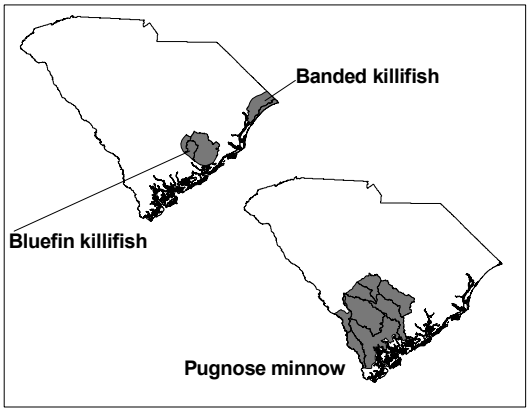
POPULATION DISTRIBUTION AND SIZE

Distribution

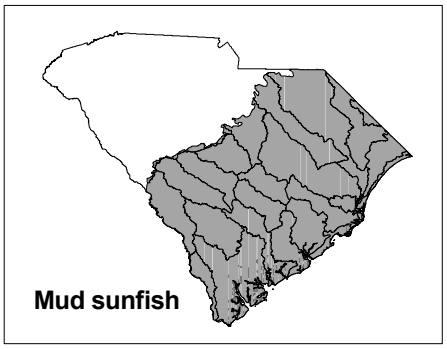
The bluefin killifish is mostly confined to peninsular Florida but is also found in western Florida to the lower Choctawhatchee River drainage and north in coastal Georgia to the Ogeechee River drainage. It is found in the Chipola River drainage in southeastern Alabama, in the Wilmington area of North Carolina and in Cooper River and Four Hole Swamp, South Carolina. Rohde et al.

(1994) suggested it might have been introduced into North and South Carolina, as its range in those states is small and isolated.

The banded killifish is widely distributed in Atlantic slope drainages from the Pee Dee River, South Carolina, north to Maritime Provinces and Newfoundland; St. Lawrence– Great Lakes and Mississippi River basins from Quebec to Manitoba; south to southern Pennsylvania, northern Illinois, and northeastern Nebraska (Page and Burr 1991). The subspecies, *F. d. diaphanus* dominates in Atlantic slope drainages and *F. d. menona* in the remainder of its range, with the exception of the St. Lawrence and Lake Erie drainages, where the two subspecies integrate. In South Carolina, the banded killifish occurs only in the Waccamaw and Sampit Rivers (SCDNR unpublished data).



The pugnose minnow occurs from the Nueces River drainage in southern Texas to the Edisto River drainage in South Carolina and north in the Mississippi River and Great Lakes basins to southeastern Kansas, southeastern Minnesota, Wisconsin, Michigan, southern Ontario, Ohio and West Virginia. The subspecies *O. e. peninsularis* occurs in the Florida peninsula and *O. e. emiliae* in the remainder of its range, except areas of intergradation in southern Georgia and northeastern Florida west to Ochlockonee river (Page and Burr 1991; Lee et al. 1980). In South Carolina, the pugnose minnow occurs only in a small area, from the Edisto River southward (Rohde et al. 1994).



The mud sunfish is widely distributed but uncommon within the coastal plain from New York to northern Florida. It also occurs in the Gulf Coastal Plain in northern Florida and southern Georgia from the Suwannee River to Saint Marks River (NatureServe 2004). In South Carolina, it is primarily restricted to the coastal plain below the fall line in the Savannah, ACE, Santee and Pee Dee River drainages.

Population Size and Trend

The bluefin killifish is common in Florida but apparently only occurs in small numbers outside of Florida (NatureServe 2004). The banded killifish is common to abundant throughout much of its range. In South Carolina, it is classified as critically imperiled because of its limited distribution. The pugnose minnow is common to rare, depending on location; it has been greatly reduced in numbers and even extirpated in some parts of its range (Rohde et al. 1994). Mud sunfish population size and trend is not well known in South Carolina, in part due its secretive nature and nocturnal behavior. Based on anecdotal reports from biologists, it appears that this fish is not a common as it once was.

HABITAT AND NATURAL COMMUNITY REQUIREMENTS

The bluefin killifish inhabits heavily vegetated ponds, lakes, sloughs, ditches and areas of little or no current in streams, such as pools or backwaters. It is frequently associated with spring habitats and may occur in waters with moderate salinity (up to 10.3 ppt) (NatureServe 2004). In the Cooper River, South Carolina it is found in abandoned rice fields that have breached dikes and are contiguous with the river.

The banded killifish thrives in a wide range of salinities, from fresh water to estuaries with salinity as high as 20 ppt. It inhabits quiet waters of lakes, ponds and sluggish streams, usually over a sand, gravel or detritus-covered bottom where there are patches of submerged aquatic plants. Banded killifish also frequently occur in estuarine waters. Schools of these fish tend to stay in shallows in summer (NatureServe 2004).

The pugnose minnow is usually found in lowlands in clear to turbid, sluggish, often weedy waters of lakes, reservoirs, sloughs, swamps and streams of all sizes. It prefers areas with a soft mud bottom (NatureServe 2004).

The mud sunfish inhabits darkly stained, often acidic, and heavily vegetated coastal plain streams, ponds, lakes and swamps (Jenkins and Burkhead 1993, Rohde et al. 1994). In streams, it prefers sluggish pools and backwaters and occupies areas with silt, mud and detritus substrates.

CHALLENGES

None of these fish are threatened globally, but the limited distribution of banded killifish, bluefin killifish and pugnose minnow in South Carolina is cause for concern. The perceived decrease in mud sunfish abundance also warrants concern. Challenges to these species are similar to those for other aquatic fauna and include alterations in channel morphology and flow, point and nonpoint source pollution and sedimentation.

CONSERVATION ACCOMPLISHMENTS

There are currently no conservation accomplishments known at this time for these species.

CONSERVATION RECOMMENDATIONS

- Determine statewide distribution, population status, life history and habitat requirements of the bluefin killifish, the banded killifish, the pugnose minnow and the mud sunfish with statewide stream surveys.
- Identify lotic and lentic habitats with healthy populations and intact critical habitat in the Cooper River and Four Hole Swamp Watershed for bluefin killifish and the Waccamaw and Sampit River systems for banded killifish. Protect these areas, once identified.
- Conduct genetic evaluation of bluefin killifish to determine whether South Carolina populations are distinct from populations in Florida.
- Determine the causes for the decline or potential extirpation of pugnose minnow in South Carolina.

- 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 landuse planning.
- Consider species needs when participating in the environmental permit review process.
- 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.
- Educate motor vehicle operators of the negative affects 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 these species. Methods that protect water quality are also likely to protect most of these species. In the event that more protective BMPs are implemented, population studies of these fish could assist in determining the effectiveness of those measures.