U.S. Fish and Wildlife Service

Cape Fear Shiner (Notropis mekistocholas)

Status: Endangered (with designated Critical Habitat)

Description: The Cape Fear shiner (*Notropis mekistocholas*) was first described as a new species in 1971. It is a small (approximately 2 inches long), yellowish minnow with a black band along the sides of its body. The shiner's fins are yellow and somewhat pointed. It has a black upper lip, and the lower lip bears a thin black bar along its margin. The Cape Fear shiner is known to consume plant and animal material. However, unlike most other minnows in the genus Notropis, the Cape Fear shiner's digestive tract is modified primarily for a plant diet by having an elongated, convoluted intestine.

Cape Fear Shiner (photo by Richard Biggins)

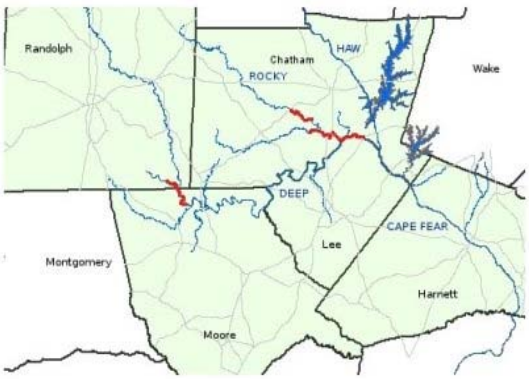
Habitat: The Cape Fear shiner is generally associated with gravel, cobble, and boulder substrates, and has been observed in slow pools, riffles, and slow runs. These areas occasionally support water willow (*Justicia americana*), which may be used as cover or protection from predators (e.g. flathead catfish (*Pylodictis olivaris*), bass (*Micropterus spp.*) and crappie (*Pomoxis spp.*)). The Cape Fear shiner can be found swimming in schools of other minnow species but is never the most abundant species. During the spawning season, May through July, the Cape Fear shiner adults move to slower flowing pools to lay eggs on the rocky substrate. Juveniles are often found in slack water, among large rock outcrops of the midstream, and in flooded side channels and pools. Cape Fear shiners are sexually mature after their first year, and are known to live up to 6 years in captivity. only consider the number of available breeding individuals.

Distribution of the Cape Fear shiner

Distribution and Range: The Cape Fear shiner is endemic to the upper Cape Fear River Basin in the Central Piedmont of North Carolina. The species is known from tributaries and mainstreams of the Deep, Haw and Rocky Rivers in Chatham, Harnett, Lee, Moore and Randolph counties. Only five populations of the shiner are thought to exist. A population is designated when groups are separated by natural barriers or manmade obstructions such as dams. Two of the five remaining populations are very small and unstable and therefore at risk of extirpation. The precise number of shiners in each population is not known, but effective population sizes in the other three populations are estimated to be between 1500 and 3000 individuals. However, effective population sizes only consider the number of available breeding individuals.

Listing: The Cape Fear shiner was listed as Endangered with Critical Habitat on September 25, 1987 under the provisions of the Endangered Species Act of 1973 (as amended). In the last few decades, the shiner has undergone a reduction in range, population sizes and populations. At the time of listing only three populations where known; these areas were designated as critical habitat.

Critical Habitat: Critical habitat is defined under the Endangered Species Act as the specific areas within the geographical area occupied by a species which have physical or biological features essential to the conservation of the species and that may require special management considerations or protection, or specific areas outside the geographical area occupied by a species but for which those areas are essential for the conservation of the species.



Red areas denote designated Critical Habitat for the Cape Fear shiner.

Designated Critical Habitat Areas:

1. Chatham County, NC. Approximately 4.1 miles of the Rocky River from North Carolina State Highway 902 Bridge downstream to Chatham County Road 1010 Bridge;
2. Chatham and Lee Counties, NC. Approximately 0.5 river mile of Bear Creek, from Chatham County Road 2156 Bridge downstream to the Rocky River, then downstream in the Rocky River (approximately 4.2 river miles) to the Deep River, then downstream in the Deep River (approximately 2.6 river miles) to a point 0.3 river mile below the Moncure, North Carolina, U.S. Geological Survey Gaging Station; and,
3. Randolph and Moore Counties, NC. Approximately 1.5 miles of Fork Creek, from a point 0.1 river mile upstream of Randolph County Road 2873 Bridge downstream to the Deep River then downstream approximately 4.1 river miles of the Deep River in Randolph and Moore Counties, North Carolina, to a point 2.5 river miles below Moore County Road 1456 Bridge.

Rocky River (Photo by David Rabon)

Primary constituent elements are physical and biological features of the designated critical habitat essential to the conservation of the species. The constituent elements for the Cape Fear shiner include clean streams with gravel, cobble, and boulder substrates with pools, riffles, shallow runs and slack water areas with large rock outcrops and side channels and pools with water of good quality with relatively low silt loads.

Threats: The main threats to Cape Fear shiner populations at the time of listing were a lack of basic biological information on the species such as life history information, how they may respond to stream channel modification, and changes to the stream flow. Dam construction in the Cape Fear River system has probably had the most serious impact on the species by inundating the shiner's rocky riverine habitat.

Today, the Cape Fear shiner is faced with many of the same threats that it faced at the time of listing. Segmentation or separation of small populations by dams and loss of riverine habitat to impoundments are major concerns. Deteriorating water quality at some previously occupied sites make those sites unsuitable to Cape Fear shiners today. In addition to known problems from population fragmentation, potential threats to the species and its habitat could come from such activities as changes in stream flow, runoff from agriculture and communities, road construction, impoundments, wastewater discharge, and other development projects in the watershed. Preventing further habitat deterioration and restoring degraded habitats can help ensure the future of the Cape Fear shiner.

Management and Protection: Ongoing research into the habitat requirements, population genetics, captive propagation, pollutant sensitivity, and life history parameters of the Cape Fear shiner is allowing biologists and managers to make better decisions regarding the species' management and conservation. Currently, captive and wild populations of Cape Fear shiner are being studied to learn more about the specie's behavior, biology, and ecology.

Education is also an important part of management. The North Carolina Zoological Park partnered with the Service in researching the Cape Fear shiner's life history. An added benefit of their involvement is an exhibit of Cape Fear shiners in the Zoo's North Carolina Streamside complex. These Cape Fear shiners are accessible for public viewing along with information presented on their status and conservation.

In 2005, the largest dam removal project ever in North Carolina, and the second largest in the United States, took place on the Deep River in the central piedmont region. This removal helped restore habitat for the Cape Fear Shiner. (photo courtesy of Restoration Systems)

Why Protect the Cape Fear shiner: Extinction is a natural process. Normally, new species develop through a process known as speciation at about the same rate they go extinct. However, because of air and water pollution, over-hunting, extensive deforestation, the loss of wetlands, and other human-impacts, extinctions are now occurring at a rate that far exceeds speciation. These actions are reducing the biodiversity on Earth.

The reduction of biodiversity reduces the ecological integrity of our environment. All living organisms perform a function in our environment and are dependent on the functions of other organisms. In turn, there is interconnectedness among species including us in the environment. In addition, Cape Fear shiners can act as indicators of a stream's chemical and physical quality and overall health. This is important because some of the streams where the shiner occurs are used for our own water supply.

What You Can Do to Help Protect the Cape Fear Shiner:

- Support land use planning that overtly maintains vegetated riparian buffers and water quality.
- Plant and maintain native vegetation along streams and creeks. These "vegetated buffers" prevent the erosion of soil and sediments into the water after heavy rains, keeping the stream clear and clean.
- Be careful when using and disposing toxic substances such as motor oil, pesticides, fertilizers, and other chemicals near creeks and streams.
- Always follow the instructions for chemical use, and properly dispose of any remaining material and the container.
- Keep livestock out of rivers and streams. Livestock can damage the stream banks by eating the bank vegetation and by causing erosion of the bank. Livestock and their waste can also pollute the water.
- Watch for fish kills, illegal dumping of waste, unusual water color or smell, and other changes in the river's condition. Report environmental emergencies (e.g., fish kills, oil or chemical spills) affecting water resources to the North Carolina Division of Emergency Management by calling 1-800-858-0368.

For More Information on the Cape Fear Shiner contact David Rabon in the Raleigh Field Office at david_rabon@fws.gov or (919) 856-4520 (ext. 16)