

Preserving a North Carolina Fishing Tradition

*N.C. Wildlife Resources Commission field staff
monitor striped bass migration in the Roanoke
River to ensure the fishery's future*

written by Josh Leventhal & photographed by Melissa McGaw



A 1947 article in *Wildlife in North Carolina* entitled, “The Rock Are Here,” described the scene as fishermen awaited the arrival of the striped bass spawning migration along the Roanoke River in Weldon. It’s a tradition that has played out year after year in the town appropriately dubbed “The Rockfish Capital of the World.”

“For Weldon, each spring is the locale of a fishing festival the like of which is seen nowhere else on earth,” the article read. “The time is a period of about a month during April and May when the striped bass, or rockfish, pour up into the Roanoke River to spawn. During those magical days, fishermen are out on the river day and night after the game, tasty target.”

The N.C. Wildlife Resources Commission is working to preserve this tradition for current and future generations of anglers amid a significant decline in the Albemarle Sound-Roanoke River striped bass population. The population is jointly managed by the Commission and N.C. Division of Marine Fisheries (DMF). Studies conducted by both agencies have shown that the population is overfished and that overfishing is occurring, meaning that there are too few spawning adults to maintain a healthy population and there is too high a

Previous: Commission biologists Chris Smith (top) and Jeremy McCargo (bottom) are busy hauling in striped bass during an electrofishing survey on the Roanoke River last spring. Right: Department of Marine Fisheries biologist Tyler Koch weighs a striped bass collected by Commission staff on the Roanoke River.

level of mortality for a sustainable harvest of the fish.

Population decline has created a need to reduce harvest and shorten the striped bass season to allow the population to recover. In 2021, the season in the Roanoke River was reduced from its normal two months to a two-week season divided between the upper river near Weldon and the lower river near Williamston. Despite the shortened season, anglers more than doubled the Roanoke River Management Area's 12,804-pound harvest quota. In 2022, the season will be limited once again in an attempt to ensure anglers do not surpass the harvest quota.

Shortening the season is a decision rooted in data collected from hours of survey and sampling work each spring. History has shown that the strategy works when there have been previous declines in striped bass populations and that the reduced harvest will lead to a long-term recovery of the population.

"We have seen highs and lows in the Albemarle-Roanoke striped bass population over the last 50 years," said Jeremy McCargo, the Commission's anadromous research coordinator. "Because we are currently at a low level of abundance, we needed to reduce harvest in the Roanoke River and Albemarle Sound fisheries by nearly 60% of the estimated amount in 2017 to end overfishing and allow the population to rebuild. With such a low harvest quota, the season for harvest in the Roanoke River needs to be short, but we still want to provide access to the fishery for those who want to keep a few fish."

Get to Know Stripers

The Commission's website (ncwildlife.org) provides detailed information about the striped bass. According to the species profile, striped bass are anadromous fish that



spend most of their lives in saltwater but migrate into freshwater rivers to spawn. The Roanoke River is the major striped bass spawning river in North Carolina.

Each spring, adult striped bass swim from the Atlantic Ocean and Albemarle Sound into the Roanoke River to spawn. After spawning, the semi-buoyant fertilized eggs must drift in the water for two or three days before they hatch. After hatching, young striped bass are carried by currents to nursery areas in the lower Roanoke River and western Albemarle Sound.

Stripers spawned in the Roanoke River generally spend two to four years of their lives maturing in the Albemarle Sound before returning to spawn in the Roanoke

River. Older, larger fish are more likely to migrate to the Atlantic Ocean between spawning events. Because they can live over 20 years, adult stripers may migrate many times from the Atlantic Ocean through the Albemarle Sound and to the Roanoke River to spawn during their lifespan.

Their popularity as a sport fish and as a commercial species has led them to be overfished in their history. A severe decline of the population in the late 1970s and 1980s led to strict regulations and water flow management that helped the species rebound.

The Albemarle Sound-Roanoke River striped bass are jointly managed by the Commission and DMF in collaboration with the Atlantic States Marine Fisheries

"The Commission has been conducting surveys of migrating striped bass in the Roanoke River each spring since 1991."

Commission, which is the managing body for migratory striped bass along the Atlantic Coast. The Commission is responsible for the Roanoke River Management Area and DMF is responsible for the Albemarle Sound Management Area. The Commission has been conducting surveys of migrating striped bass in the Roanoke River each spring since 1991.

Commission biologists conduct electrofishing surveys at six different locations along the Roanoke River one day a week from early April to late May. Each fish captured during the survey is netted and placed in an oxygenated live well until it can be measured and weighed and have its sex determined, if possible. Scales are taken from various fish to be used for determining age. DMF staff insert tags in the abdomen of fish before they are released back into the river. Commission staff also conduct creel surveys beginning in early March through the end of the season to determine harvest rates along the river.

A Fishery Under Pressure

A significant decline in striped bass adults and recruitment of juveniles in the Albemarle-Roanoke fishery has been revealed through a recent stock assessment. The assessment examined data from the Juvenile Abundance Index and gillnet surveys conducted by DMF in the Albemarle Sound along with Commission electrofishing surveys in the Roanoke River. The information is analyzed to determine the pounds of adult female fish returning to the spawning grounds, fishing mortality rates and an overall stock status determination. Data indicate that the fishery is overfished and that overfishing is occurring.

A few examples of the data from the study include:

The Juvenile Abundance Index shows the reproduction and recruitment for each

year. The index indicates several strong years in the 1990s and a peak of roughly 60 juvenile fish per net haul in 1999–2000. However, a steady decline beginning in 2014 has led to very little recruitment of juvenile striped bass in the Roanoke River since 2017.

A similar trend was discovered in the Roanoke River Electrofishing Index, with a steadily increasing abundance of adults throughout the 1990s and into the early 2000s before a decline began from which the fishery has yet to recover.

"We saw an expansion of the population throughout the '90s and large abundances in the 2000s followed by a decline in the late 2000s and 2010s to where we are now at the end of the time series," McCargo said.

That same pattern was also found in samplings of older (age 9-plus) fish, which are critical to producing large numbers of juveniles. Electrofishing surveys on the Roanoke River throughout the 1990s revealed few older fish as the population recovered from overfishing in the 1980s. A spike in the population of older fish occurred in the 2000s followed by a steady decline beginning in roughly 2008. "In the last few years we have seen very few if any of the [older] females in the population," McCargo said.

The stock assessment also provides estimates of spawning stock biomass or the pounds of females in the spawning population. The target for the number of females in the population is at least 350,000 pounds



Top to bottom: A tag is inserted into the abdomen of a striped bass after it is measured for length. The tag is checked for correct placement and the unique tag number is confirmed. Scales are removed from the top of the striped bass, placed in small envelopes and later used to determine the age of the fish.



Top: Chris Smith hands fish to Commission Conservation Technician Barry Midgette for transportation to Watha State Fish Hatchery. Bottom: Smith nets fish from the electrofishing boat to move to the DMF work-up boat for tagging.

with a minimum threshold of 267,000 pounds required to maintain a healthy fishery. From 2007 to 2017, the spawning stock biomass was below that threshold and target, indicating that the population was overfished and the abundance of females was too low to maintain a healthy population. Similarly, fishing mortality rates have been above the threshold for maintaining a healthy population since 2004, indicating that overfishing is occurring and fish are being removed too quickly from the population.

“The management measure we can use to respond to [overfishing] is to reduce harvest,” McCargo said, leading to DMF’s decision to reduce last year’s total allowable landings (or harvest quota) for the entire Albemarle-Roanoke recreational and commercial fishery to 51,216 pounds. That number was split between the commercial and recreational fisheries, with Roanoke River and Albemarle Sound management areas each receiving a recreational quota of 12,804 pounds. The Albemarle Sound commercial fishery quota was 25,608 pounds.

“In the Roanoke, we really condensed the season, so there were a lot of anglers out. The weather was nice and water flows were adequate,” McCargo said, noting that the season was timed based on the results of previous creel surveys. “They actually did

about twice of what the average harvest per day had been over the last 10 years.”

Regulating water flow in the Roanoke River is one of the biggest challenges to maintaining a healthy striped bass population. Too much flow will wash away the eggs before they can hatch; too little will send them into the sediment at the bottom of the river. Flows are also critical to the timing of when newly hatched stripers are delivered to the estuary in western Albemarle Sound.

There are three successive dams along the river. Dominion Energy manages the Roanoke Rapids and Gaston dams while the Army Corps of Engineers manages the John H. Kerr dam. Both entities provide beneficial flows for striped bass spawning in the spring according to their operating requirements. Unfortunately, recent high flood events have occurred over the past few years due to excessive rains. This flooding has been detrimental to survival of striped bass eggs and juveniles.

Ideal flows in the river would be roughly between 5,000 and 10,000 cubic feet per second during the spawning season in the spring. That streamflow was met in 2005, which also produced a great year for striped bass spawning and recruitment. Recent poor spawning years can be connected to heavy rainfall that caused

“The management measure we can use to respond to [overfishing] is to reduce harvest.”

high water levels in the river. In 2013, there were several flooding events in the spring where the flow was above the threshold for 35 of 41 days. Subsequently, almost no juvenile fish were observed that year. In 2017 through 2020, significant flooding events in excess of 20,000 cubic feet per second occurred in the spring spawning season.

“Overharvest of adult striped bass along with recent less-than-ideal spawning conditions have resulted in overfishing,” McCargo said. “A lot of high water events and high harvest events that result in overfishing.”

Moving Forward

The Commission approved a temporary rule change reducing the number of fish that can be kept per day from two to one with an additional reduction in season length.

“The reduction in the number of fish that can be kept per day is necessary to avoid exceeding the harvest quota again in this popular fishery,” McCargo said at the time. “We are optimistic that the reductions

in the harvest of spawning fish in the Roanoke River as well as in the Albemarle Sound will result in higher numbers of adult striped bass returning to spawn in the Roanoke River.”

Past strict regulations on the Roanoke River reversed declines in striped bass populations. The fishery was declared “recovered” in 1997 following significant declines in the population throughout the 1980s and early ‘90s caused by overfishing and poor water flow.

“Once we put restrictive measures in place in the ‘80s, we had the best recruitment we had seen there in years,” McCargo said. “Then those fish need to grow to maturity, which can take another three years. So, we could be looking at a five to 10-year recovery period...It can be a pretty quick rebound once we get some better recruitment.” ♦

Josh Leventhal is the editor of Wildlife in North Carolina. He can be contacted at josh.leventhal@ncwildlife.org.



Above: Juvenile striped bass like this one have been in short supply in the Roanoke River in recent years. Bottom left: Chris Smith displays a large striped bass collected on the Roanoke River. Bottom right: Recently retired coastal fishery supervisor Chad Thomas measures an angler’s striped bass while conducting a creel survey at Weldon.

