



# Roanoke River American Shad Spawning Stock Survey

January 2018

Since 2000, the N.C. Wildlife Resources Commission (NCWRC) has conducted annual spring electrofishing surveys of American Shad in the Roanoke River near Gaston, NC. American Shad are anadromous fish, spending the majority of their adult lives at sea and migrating up coastal rivers in the spring to spawn, typically returning to the spawning grounds when they reach 2 to 3 years of age. Historically, American Shad were abundant and supported exceptional commercial and recreational fisheries in the Roanoke River. Spawning habitat loss, fragmentation caused by the construction of dams, overharvest, and other factors have contributed to the decline of American Shad populations along the Atlantic Coast.

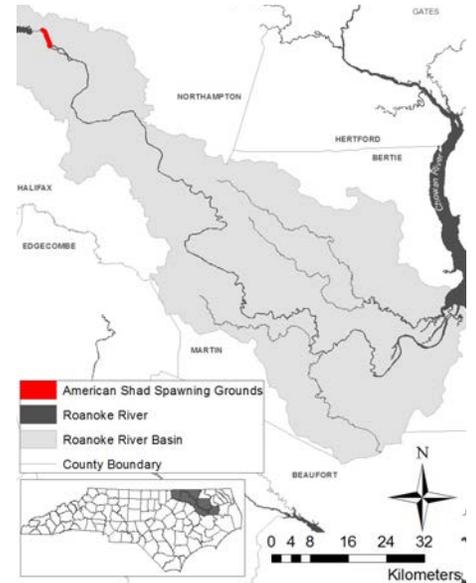
Due to the ecological importance of American Shad in the Roanoke River as well as providing opportunities for recreational fisheries, the NCWRC has put tremendous effort into monitoring and restoring American Shad populations in this system. Since the inception of a hatchery-based stocking program developed by NCWRC in 1998, nearly 76 million fry have been stocked into the Roanoke River Basin. To conserve the spawning stock during restoration efforts while still allowing harvest, the creel limit for American Shad was reduced to one fish per day in 2008. NCWRC boat electrofishing surveys begin in March as water temperatures approach 45°F and end when American Shad spawning appears complete, usually in early June. Optimal spawning temperatures for American shad range between 60°F and 68°F. Population characteristics including size distribution, age structure, and sex ratio of the spawning stock are summarized and detailed in a final report.

## Project Objectives:

- Document changes in population characteristics of American Shad on the Roanoke River spawning grounds to evaluate stocking practices and effectiveness of regulations.
- Monitor long-term changes in American Shad relative abundance (CPUE: number of fish collected per hour of electrofishing effort), sex ratio, size structure, and age structure.

## Methods:

- American Shad were collected weekly near the Gaston Boating Access Area (Northampton County) between March 2 and June 1, 2017.
- Each week, seven shoreline sites and two mid channel sites were surveyed using a boat mounted electrofishing unit. American Shad were netted as encountered and held in an oxygenated live well until the site was completed.



*American Shad spawning stock survey area on the Roanoke River*



*Katy Potoka, District 1 Fisheries Biologist with a female American Shad collected near the NCWRC Gaston Boating Access Area*



*Large female American Shad collected from the Roanoke River*



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- All fish were measured for total length, weighed, and sex was determined. Otoliths (ear bones) were obtained from a sample of both females and males to determine age.
- Fin clips were collected and submitted for genetic testing to determine if fish were of hatchery origin.
- Water quality was measured at each site, including: water temperature, dissolved oxygen, and salinity.

## Initial Results:

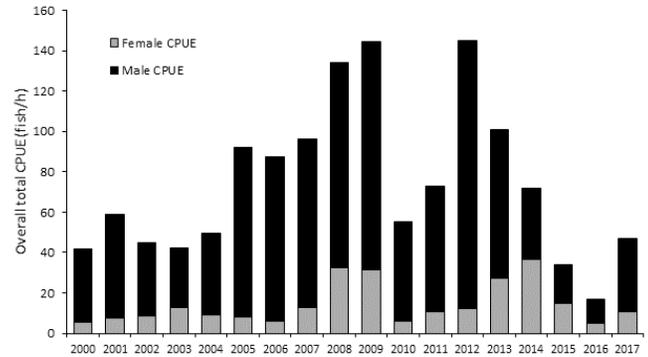
- In 2017, a total of 516 American Shad were collected during weekly surveys, and overall catch per unit effort was 46 fish per hour of boat electrofishing. The overall CPUE in 2017 was higher than in 2015 (34 fish/h) and 2016 (17 fish/h).
- American Shad were collected on the spawning grounds when water temperature ranged between 48°F and 72°F. Peak weekly CPUE occurred on April 20th with an average water temperature of 66°F.
- The overall male to female ratio was approximately 3.5:1; with a total of 401 males and 115 females collected.
- Female American Shad ranged in length from 17 to 22 inches with a maximum weight of 3.5 lb., while male American Shad ranged from 15 to 20 inches in length and had a maximum weight of 2.6 lb.
- American Shad ages ranged 3–6 years for males and 4–7 years for females.

## What's next?:

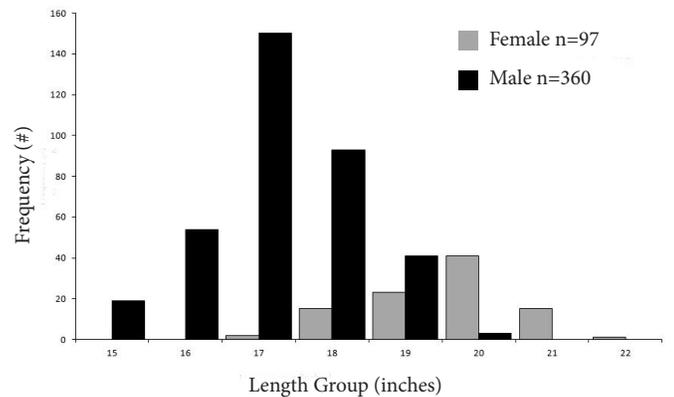
- American Shad spawning ground survey data from 2016 and 2017 will be presented in a more detailed formal report in 2018. This report will also evaluate the contribution of hatchery fish in the population.
- The spawning ground survey data is included in an annual report to the Atlantic States Marine Fisheries Commission and is utilized, in partnership with the North Carolina Division of Marine Fisheries, during the development of the American Shad Sustainable Fisheries Management Plan.
- NCWRC will continue to monitor spawning populations of American Shad each spring on the Roanoke River. Restoration will focus on enhancement of the spawning population while providing opportunities for recreational anglers.

## For more information, please contact:

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CPUE: Catch rates (electrofishing CPUE) of American Shad collected from the Roanoke River 2000–2017.



Length Frequency: Sizes of male and female American Shad collected from the Roanoke River during the spring of 2017.



## How You Can Help

Your purchase of fishing tackle, fishing licenses and motorboat fuel helps support fisheries work conducted by N.C. Wildlife Resources Commission fisheries biologists through the Sport Fish Restoration Program administered by the U.S. Fish and Wildlife Service.

