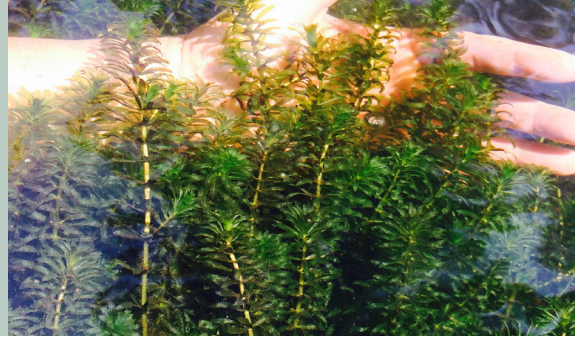
Fisheries Research Fact Sheet

Monitoring the Effects of Hydrilla Removal on Fish and Crayfish Communities in the Eno River

July 2017

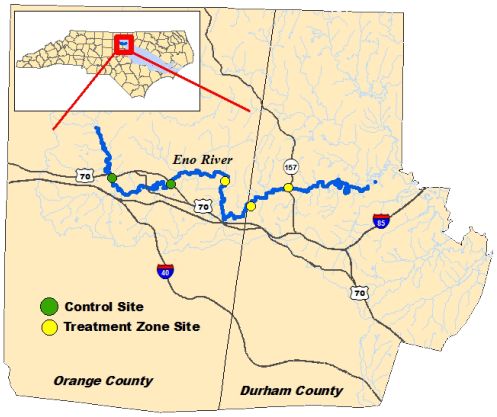


Hydrilla was first observed in the main stem of the Eno River in 2005.

The N.C. Wildlife Resources Commission is monitoring changes within the Eno River's fish and crayfish communities to gain a better understanding of how they are responding to the removal of hydrilla within the system. Hydrilla can negatively impact these aquatic communities by altering available habitat and outcompeting native aquatic plants.

Hydrilla, a federally and state-listed noxious weed, was first observed in the main stem of the Eno River in 2005 and has since infested over 20 miles of river in Orange and Durham counties. In 2013, the Eno River Hydrilla Management Task Force (http://nc-ipc.weebly.com/eno-river-hydrilla-project.html) was created and is a partnership between multiple government agencies, North Carolina State University, and non-profit organizations to address the growing concern over the infestation. The result of this collaboration was the installation of an herbicidal drip system that releases a low concentration of fluridone into the river during hydrilla's growing season, beginning in the spring and continuing into the early fall months.

Monitoring efforts that were conducted prior to the herbicide treatment will be compared to those conducted during the first three years of treatment. Variation within the fish and crayfish communities could indicate environmental changes, such as habitat availability, or changes in nutrient levels related to the removal of hydrilla from the system.



Sample site locations used to monitor the response of fish and crayfish communities in the Eno River to hydrilla removal. Insert shows the location of the Eno River (blue) in the upper Neuse River basin (light blue).

Project Objectives:

- Compare fish and crayfish communities from surveys conducted before and after the treatment of hydrilla in the Eno River to determine possible responses of these aquatic communities to the removal of hydrilla within the system.
- Monitor overall abundance and recruitment for fish and crayfish, as well as, the percentage of fish from different habitats and trophic level, and the condition of predators like Roanoke Bass.

The Roanoke Bass, a federally listed species of concern and popular sport fish, is found in the Eno River.

Methods:

- Fish and crayfish are collected once a year from five sample sites in the Eno River during May. Two control sites are located upstream of the herbicidal drip system and three sites are located within the treatment zone.
- Fish are collected using a barge electrofishing unit from sites that are approximately 1,000 feet in length. All fish are identified and counted, and a subset of fish are measured (length) and weighed before being released back into the river. Habitat and vegetation information is collected for each site.
- Crayfish are collected from 50 randomly selected quadrat samples in a 330-foot section of the river. Rocks are lifted and the water is agitated in a 3.25 ft^2 quadrate to sweep crayfish downstream into a block seine for collection. Crayfish are identified, counted and life stage is determined. Habitat and vegetation information also is collected.

NCWRC staff use randomized quadrat sampling to survey the crayfish community in the Eno River.

Results so Far:

- Between 2013 and 2015, before any efforts to treat the hydrilla were initiated, the NCWRC collected information on the fish and crayfish communities in the Eno River. All five sampling sites have a large diversity of fish species ranging from 21 to 27 species per site, including the Roanoke Bass, a federally listed species of concern. Catch rates for individual species vary from year to year, but some of the more common species found are Bluehead Chub, Redbreast Sunfish, Roanoke Darter and White Shiner. The total number of fish collected at a single site ranged from 1,337 to over 3,000 individuals. Crayfish species diversity ranged from one to four species per site and total numbers collected ranged from 48 per site to over 300 individuals.
- The herbicidal treatments in 2015-2016 have significantly decreased hydrilla density within the treatment zone.

NCWRC staff use a barge electrofishing unit to sample the fish community in the Eno River.

What's next?:

- Continued monitoring of fish and crayfish communities until 2018 to assess any immediate responses within these aquatic communities to the removal of hydrilla within the herbicide treatment zone.
- Evaluate the need for long-term monitoring of these communities in response to continued herbicide treatments.

For more information, contact:

Jessica Baumann, District 3 Fisheries Biologist 1
919-218-1434 jessica.baumann@ncwildlife.org