Fisheries Research Fact Sheet

An Overview of the Shearon Harris Reservoir Habitat Enhancement Project

November 2020

Shearon Harris Reservoir (Harris Lake) is a 4,151-acre impoundment in the upper Cape Fear River Basin, located approximately 20 miles southwest of Raleigh, NC (Figure 1). The primary function of the reservoir is a cooling source for the Duke Energy Progress nuclear powered electric generating facility; however, its close proximity to a highly urbanized area also makes it a popular destination for anglers. Anglers can access the reservoir using two N.C. Wildlife Resources Commission (Commission)-owned boat ramps.

Harris Lake supports multiple sportfish populations, with an angler creel survey showing Largemouth Bass, followed by crappie, as the most popular species sought by anglers. It was ranked number one in the Southeast and 4th in the nation in 2017 by Bassmaster magazine for best bass lakes in America and has been in the top 10 in the Southeast since 2017. Largemouth Bass catch rates during Commission sampling are above average for a Piedmont reservoir. It also has an excellent crappie fishery with catch rates above average during Commission sampling. The undeveloped shorelines provide a large amount of available fish habitat for anglers.

Harris Lake has diverse aquatic habitat, including rock outcroppings, flats, roadbeds and aquatic vegetation. Hydrilla, classified as a federal and state noxious weed, is present in the reservoir (Figure 2). Hydrilla was first reported in Harris Reservoir in 1988 and by the mid-1990s became the dominant submerged aquatic plant species in the reservoir covering over 1,000 acres. A September 2018 survey by the N.C. Division of Water Resources found 232 acres of standing Hydrilla in the lake. Officials do not know the exact cause for the decline in Hydrilla prior to any management.

The sale and possession of Hydrilla are prohibited in the United States and in North Carolina. Hydrilla infestations can lead to several undesirable events, including the loss of municipal and recreational use of waters and habitat alterations. Advanced infestations decrease the available volume of water, inhibit recreational activities, and have the potential to foul water withdrawal intakes, along with outcompeting native vegetation. Docks and boat slips can become unusable during the summer and fall months when surrounded with dense Hydrilla growth. While Hydrilla was not causing operational problems at Harris Lake, due to the central location of Harris Lake and the close proximity to the Cape Fear River, the lake is deemed as a source of Hydrilla and warrants high priority for Hydrilla management.

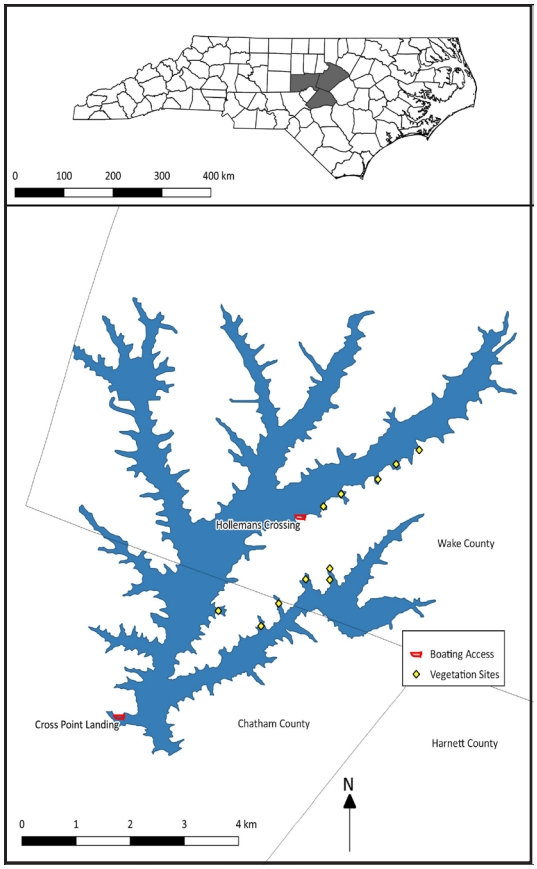

Figure 1. Map of Harris Lake showing the two boat ramps and native vegetation sites

Figure 2. Hydrilla underwater (David J Moorhead, University of Georgia Bugwood)

The N.C. Division of Environmental Quality's Aquatic Weed Program and Duke Energy began stocking sterile Grass Carp in Harris Lake to control Hydrilla, with 1,400 fish stocked in December 2018 and 2,600 fish stocked in May 2019. An October 2019 vegetation survey did not find any Hydrilla. In spite of the negative impacts, Hydrilla created habitat that was utilized by fish and other aquatic animals. In 2018, the Commission proposed a multi-year habitat enhancement project to help offset the loss of habitat.

Lyngbya, a benthic cyanobacteria, is also present in the reservoir and was estimated to cover approximately 150 acres in 2015, 180 acres in 2018 and 5.5 acres in 2019 (Figure 3). Lyngbya is aesthetically displeasing and forms dense benthic and surface mats. It also produces toxins that can cause skin irritation. Some beneficial native aquatic vegetation, such as pickerelweed, have been shown to compete with Lyngbya.

Figure 3: Lyngbya (Mark A. Heilman)

Project Objective:

- To develop and implement a 5-year aquatic habitat enhancement plan in Harris Lake that mitigates habitat losses from stocking sterile Grass Carp by establishing beneficial native aquatic vegetation and installing natural and artificial habitat in order to maintain a balanced and popular fishery.

Methods:

- Develop a 5-year Habitat Enhancement Plan with input from the public and partners on the type and placement of habitat throughout the lake through public meetings and outreach. By 2023, deploy approximately 30 acres of artificial and natural structure (400 to 700 fish attractors) at numerous sites throughout the lake, including establishing three fishing coves with shallow water habitat.
- Establish founder colonies of native aquatic vegetation totaling approximately one acre. Some founder colonies will be enclosed with fencing (Figures 4 and 4a) to protect them from herbivores, such as turtles, muskrats and sterile Grass Carp.
- Fell 20 trees into the water and cable them to the shoreline.

Figure 4: Example of a fenced exclosure to protect beneficial vegetation from herbivores (NCWRC)

Figure 4a: Close-up view of a fenced exclosure to protect beneficial vegetation from herbivores (NCWRC)

Results:

- A Habitat Enhancement Plan was developed in 2018. All fish attractor sites and areas to restore aquatic vegetation were identified by the public. The plan is updated annually based on additional public input and work completed each year and can be found at: ncwildlife.org/HarrisLakeHabitatPlan

Results (continued):

Figure 5: Example of fish attractors being placed into Harris Lake (NCWRC)

- In 2018, 50 artificial fish attractors resembling tree habitat (Figure 5) were placed at various locations around the lake. In 2019, 273 additional fish attractors were placed at 57 areas selected by anglers. There are now approximately 350 fish attractors deployed at 68 sites, all of which are marked with GPS coordinates and can be found at: ncpaws.org/wrcmaps/WRCFishAttractors.
- Additionally, fish attractors placed in water shallower than 12 feet are marked with buoys.
- Fish attractor sites contain numerous fish attractors grouped together in a relatively close configuration, with plans to expand most of these sites into larger reef type areas, along with establishing new sites, in 2020 and 2021.
- In addition to the artificial fish attractor sites, approximately 11 sites in 2018, 26 sites in 2019 and 51 sites in 2020 have been planted with native aquatic vegetation such as water willow, maidencane, pickerelweed, arrowhead, soft-stem bulrush, white water lily, spatterdock, watershield, eelgrass and pondweed. Plants needing protection from herbivores, such as eelgrass and pondweed, were planted within exclosures at many of the sites.
- In March 2020, the Commission received a $30,000 grant from the Reservoir Fish Habitat Partnership (friendsofreservoirs.com) to enhance fish habitat on Harris Lake and upgrade the Commission's aquatic plant nursery. Habitat work will intensify until the grant ends in September 2021.

In Summary:

- Research has shown that removal of Hydrilla does not change overall population levels, abundance or size structure of Largemouth Bass, yet changes their behavior and ultimately how they are fished for. This project is attempting to mitigate the loss of one type of habitat with another and provide beneficial habitat without the undesirable consequences of Hydrilla.

What's Next:

- Continue expanding and intensifying habitat work over the next several years and create three shallow water habitat fishing coves.
- Continue to gather input from the public to strategically place artificial habitat and optimize habitat enhancement work.
- Continue to evaluate relative abundance, size distribution, and age and growth data in the Largemouth Bass and crappie fisheries to monitor any trends that could indicate a change in what is now an outstanding fishery for both species.

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