Fisheries Research Fact Sheet

A Historical Overview of the Lake Gaston Habitat Enhancement Project

July 2019

Lake Gaston is a 20,300-acre reservoir on the Roanoke River, located upstream of Roanoke Rapids Lake and downstream of Kerr Lake on the Virginia-North Carolina border (Figure 1). Lake Gaston is owned and operated by Dominion Energy. It was completed in 1963 and is used for hydropower production, flood control, water supply, and recreation. The lake has a maximum depth of 95 feet and a mean depth of 20 feet. Lake Gaston supports multiple sportfish populations, with Largemouth Bass, catfish, Striped Bass, and crappie being the most targeted species by anglers during a 2007–2008 creel survey at Lake Gaston.

Aquatic vegetation is an important component of productive fish and waterfowl habitats. Aquatic macrophytes also serve to anchor bottom sediments, stabilize underwater slopes, and remove suspended particles and nutrients from overlying waters. Invasive-exotic aquatic vegetation can displace native vegetation and has a tendency to spread quickly. Specifically, hydrilla (a federal and state noxious weed) skyrocketed in Lake Gaston since first appearing there in the 1980s (Figure 2). Surveys conducted by North Carolina State University in 1985 discovered 200 acres of Brazilian elodea and 12 acres of hydrilla. Hydrilla infestations 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 (Figure 3).

The Lake Gaston Weed Control Council is the primary governing body and is composed of three members from each of the five lake counties. The council was formed in December 1985 to formulate solutions to the Brazilian elodea problem in the reservoir. Since that time drawdowns, herbicides, and Grass Carp have been used to control invasive vegetation, primarily hydrilla, at Lake Gaston. The Weed Control Council created the Lake Gaston Task Force in 1991 to provide technical expertise and guidance in weed control. The Task Force included members from Dominion Power, N.C. Wildlife Resources Commission (Commission), Virginia Department of Game and Inland Fisheries, U.S. Army Corps of Engineers, North Carolina Division of Environmental Health, North Carolina Division of Water Resources, and North Carolina State University. This group has since evolved into the Technical Advisory Group (TAG), whose role is to meet at least once a year and develop strategies for long term adaptive management of aquatic vegetation at Lake Gaston. The Bass Anglers Sportsmen Society (B.A.S.S.) reacting to concerns of controlling hydrilla with Grass Carp convened a meeting of stakeholders in December 2004, known as the Stakeholders Board. The Stakeholders Board is composed of one voting member for each various interest group (homeowners, anglers, boaters, tourism and business councils, a power company, local, state, and federal government agencies). A key goal was to develop and maintain a healthy lake ecosystem based on a diverse plant community dominated by native species. The TAG advises the Stakeholders Board who in turn advises the Weed Control Council on how limited funds should be spent for managing vegetation in Lake Gaston.

A winter drawdown was conducted in 1987–1988 and was successful at controlling Brazilian elodea, yet had stimulatory effects on hydrilla tuber sprouting and likely contributed to a worsening of the hydrilla problem. Hydrilla infestations increased to 429 acres by 1991, and to over 3,000 acres from 1995 through 2006. Triploid Grass Carp were first stocked into Lake Gaston in 1995 and were stocked at relatively low levels (approximately 8 to 15 fish per acre of hydrilla) until 2011, when 18.5 fish per acre were stocked (Figure 4). Grass Carp stocking recommendations are based on a cohort model developed by the Commission and adjusted to the stocking rate per acre of hydrilla along with annual fish mortality rates. Stockings have remained at 18.5 fish/acre of hydrilla since 2011 and are based on fall surveys conducted by NC State University and numerous volunteers. This survey is critical to monitor results and plan for treatment options the following year. The most recent survey in the fall of 2018 showed hydrilla at less than 400 acres. Complete eradication of aquatic vegetation can increase shoreline erosion and have serious negative impacts on f have been established as founder colonies at numerous sites throughout the lake. Submersed plants needing protection from herbivores, such as eelgrass and pondweed, were planted within fenced exclosures at many of the sites (Figure 5).

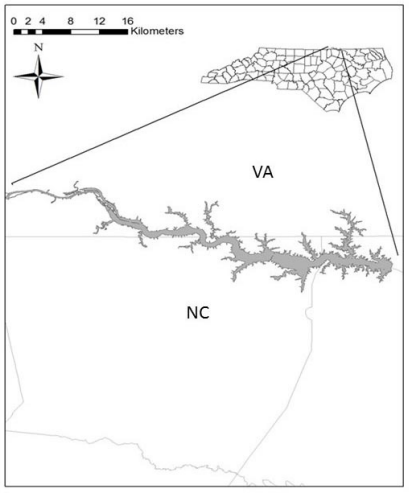

Figure 1. Map of Lake Gaston

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Objectives:

- Monitor changes in hydrilla acreage.
- Establish new founder colonies and monitor the success of native vegetation from these founder colonies.

Methods:

- Every spring and summer recommended herbicides are applied by a professional applicator.
- If needed, based on the cohort model, Grass Carp are stocked in the spring.
- Every summer (the Lake Gaston Association, the Commission, Virginia Department of Game and Inland Fisheries, and NC State University) build new fenced exclosures, maintain existing exclosures, and plant additional native aquatic vegetation.
- The fishery is monitored by the Commission on a routine basis.

Results:

- So far numerous exclosures have been built and native vegetation has been established throughout the shoreline areas of the lake.
- Monitoring shows that native aquatic vegetation is successful in most locations.
- Fisheries survey results indicate that abundance, relative weights, size structure, and recruitment have remained good to excellent for Largemouth Bass and crappie since surveys began at Lake Gaston, indicating that changes in habitat over the years have not impacted the fishery.

In Summary:

- Lake Gaston is currently demonstrating low levels of hydrilla and increasing levels of native vegetation, along with maintaining a healthy fishery.

What's next?:

- Continue the fall vegetation survey at Lake Gaston.
- Continue stocking Grass Carp at recommended rates.
- Continue to maintain the exclosures and native vegetation plantings.
- Continue to monitor the fishery at Lake Gaston.

For more information, please contact:

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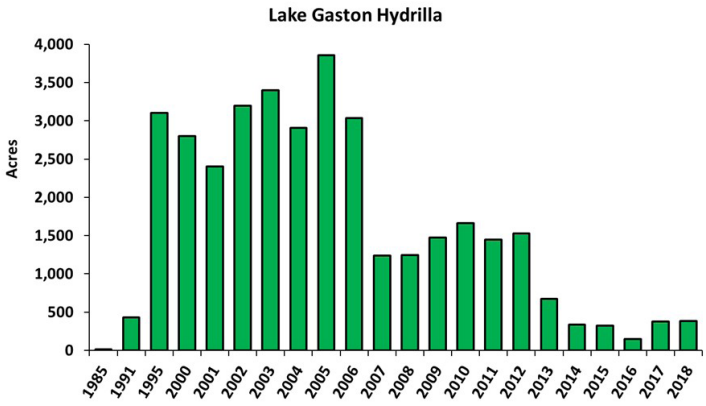

FIGURE 2.—Acres of hydrilla from 1985–2018 at Lake Gaston.

FIGURE 3.—Hydrilla engulfing a boat ramp at Lake Gaston.

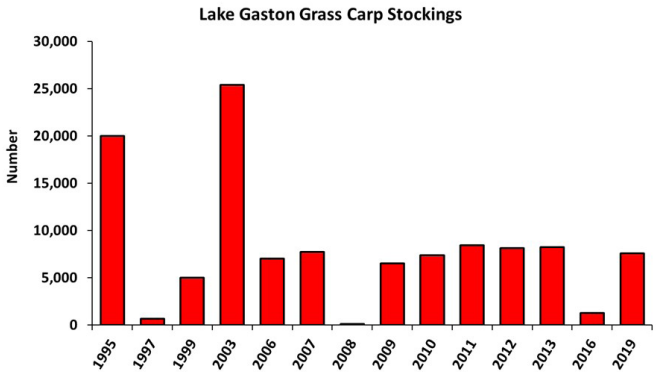

FIGURE 4.— Grass Carp stocked into Lake Gaston from 1995–2019. Note: stockings were not conducted annually.

FIGURE 5.—Example of a fenced exclosure to protect native vegetation at Lake Gaston.