

**A Five Year Plan for Operational Establishment of Native Aquatic Vegetation in  
Lake Gaston**

A Proposed Partnership with:

Lake Gaston Weed Control Council

Presented by:

North Carolina State University Aquatic Weed Management Program

and

North Carolina Wildlife Resources Commission

## Project Proposal

Title: A Five Year Plan for Operational Establishment of Native Aquatic Vegetation in Lake Gaston

Need: Hydrilla *H. verticillata*, an invasive aquatic plant, is established throughout Lake Gaston and is currently being managed using herbicides and grass carp. The existing Aquatic Plant Management Plan calls for maintaining 300 acres of hydrilla for fish and wildlife habitat. Current funding levels are inadequate to manage hydrilla in all areas of the lake. Native aquatic vegetation communities can compete with hydrilla and provide habitat for fish and other wildlife.

Objective: To improve physical habitat for sport fishes by diversifying and expanding the native aquatic macrophyte communities while helping to prevent the spread of nuisance exotic plants.

Expected Results and Benefits: We hope to improve physical habitat for sport fish and wildlife and suppress hydrilla growth in areas traditionally unmanaged with herbicides or its reestablishment in areas where it has been eradicated.

Approach: It is requested that the Lake Gaston Weed Control Council (LGWCC) partners with the North Carolina State University Extension Service (NCSU) and the North Carolina Wildlife Resources Commission (Commission) to develop and implement a long-term (5-year) native aquatic re-vegetation plan for Lake Gaston. The lake wide plan will build upon the U. S. Army Corps of Engineers' previous re-vegetation efforts and include assessment protocols to determine the project's success. Implementation will rely heavily on volunteers to build exclosures and harvest and plant aquatic vegetation.

Location: Lake Gaston, North Carolina and Virginia.

Estimated Total Project Cost: \$150,717

LGWCC Cost: **\$54,000**

### Introduction

Native aquatic plants provide valuable fish and wildlife habitat, serve as a food source for waterfowl and other aquatic wildlife, improve water clarity and quality, and help prevent spread of nuisance exotic plants and reduce rates of shoreline erosion and sediment re-suspension. These desirable qualities make worthwhile efforts to establish native aquatic plants in our water resources.

Lake Gaston currently relies on an adaptive and integrated pest management strategy for the control of invasive aquatic vegetation species. A legacy infestation of hydrilla over the past few decades has been managed with annual herbicide treatments and the long-term stocking of grass carp. Adequately funded, these methods provide a means to control hydrilla and suppress its expansion, especially in newly infested water bodies. Due to the prolific nature of hydrilla and the regeneration of the plant from subterranean turions, it is necessary to manage a legacy infestation over multiple, continuous years in order to reduce hydrilla biomass in the long-term. All portions of Lake Gaston's littoral zone have been subject to hydrilla establishment and current management strategies continue to strain local and state budgets. These budgets limit the ability, specifically of herbicide treatments, to be administered on a lake-wide scale over the time span needed for long-term progress. The funding sources currently available for hydrilla control in Lake Gaston are stressed by current economic constraints as well as increased incidence of hydrilla elsewhere at the state level.

The eradication of hydrilla in Lake Gaston is unlikely through the current level of available funding. There is a need for a management approach that aims to suppress excessive hydrilla growth, especially in areas not designated for priority chemical control. Native aquatic plant restoration is considered a beneficial addition to currently existing management procedures.

In Lake Gaston, re-vegetation demonstrations have been underway since 2006. The demonstrations have shown the viability of vegetation founder colonies using a large number of exclosures. Several submersed and floating leaf plants have shown high survival rates in areas of the lake not traditionally designated for herbicide treatment, specifically the use of systemic Fluridone. American pondweed, Illinois pondweed, American lotus, white waterlily, watershield, spatterdock, wild celery, and coontail have all shown near 100% survival in some field demonstration exclosures. Spread outside of existing exclosures has been variable, but may be attributed to a lack of maintenance and constant monitoring. Some species have spread quite well outside of exclosures to nearly 30 times original colony size. The addition of emergent species in 2008 also saw considerable survival (100% in many cases) for arrowhead, lizard's tail, pickerelweed, soft rush, softstem bulrush, squarestem spikerush and water willow. Furthermore, this work has been shown to suppress hydrilla within demonstration sites, especially when floating leaf species are present.

The next step for re-vegetation in Lake Gaston is transitioning existing demonstration plantings into an operational re-vegetation program for the Lake. Therefore, we propose a partnership with NCSU, LGWCC and the Commission to implement such an operational re-vegetation plan on Lake Gaston as part of the existing aquatic plant management plan.

### **Methods**

The following steps outlined below are necessary to complete the five year project.

- Describe current state of past demonstration plantings and native species lake-wide
- Develop a list of resilient species based on past demonstrations and literature
- Identify areas for continued re-vegetation throughout the lake (plant protection areas, low development, low priority for chemical control)
- Identify and create a clean source for plant material either nearby or within Lake Gaston
- Expand existing aquatic plant colonies beyond current exclosures
- Implement founder colonies in applicable portions of the lake
- Develop a monitoring protocol to assess the planting success and its effects on hydrilla and habitat improvement
- Implement re-vegetation plan using founder colonies with fenced exclosures over the next five years.

The LGWCC would purchase materials needed to build and mark exclosures, purchase plant material if needed and assist in finding volunteers to help with the effort. The Commission would provide staff time and equipment to help develop the re-vegetation plan, assist with building exclosures, harvest and plant founder colonies and assess the success of the project. The NCSU's Lake Gaston Coordinator position, funded by LGWCC, will help develop the re-vegetation plan, coordinate volunteers, help build exclosures, harvest and plant founder colonies and assess the success of the project.

## Project Costs

The total project costs for all five years are estimated to be \$150,717 with \$88,282 in-kind from NCWRC and \$8,435 from NCSU (Table 1). The total requested amount to be funded by the **Lake Gaston Weed Control Council** is **\$54,000** split over *FIVE* years.

## Project Timeline

The proposed re-vegetation work is anticipated to occur over a period of five years. Assessment will occur on an annual basis and be summarized in a report to the Lake Gaston TAG and Weed Control Council.

Year 1 –

- Assess current state of existing enclosures and native vegetation lake-wide
- Develop a re-vegetation plan that includes a species list for continued re-vegetation, identifies sources of plants within Lake Gaston and priority areas to re-establish vegetation and a monitoring protocol to determine project success.
- Expand existing enclosure colonies beyond current areas

Years 2,3,4 –

- Implement operational re-vegetation in sites identified in year 1
- Assess year (x) expansions
- Develop a plan for self-sustainability of large sites

Year 5 –

- Implement operational re-vegetation in sites identified in year 1
- Assess all new and existing plantings
- Ensure sustainability of all existing sites through identification of volunteers
- Develop final report for Lake Gaston TAG and Weed Control Council

## Conclusion

Operational re-vegetation of Lake Gaston will provide a hydrilla minimization solution for areas not traditionally targeted through other active hydrilla management, such as herbicides. Not only will re-vegetation suppress hydrilla growth in traditionally unmanaged areas, but it will provide crucial aquatic habitat in a water body with few other native species present and lack of a widespread native seed bank. A diverse native plant community will provide the habitat complexity needed to support a wide variety of aquatic species. Improvements to recreational fishing and aesthetic value are also expected in these remote areas without impacting other forms of recreation (boating, skiing, etc.) traditionally impacted by hydrilla.

TABLE 1.—Estimated costs associated with the re-vegetation project in Lake Gaston, 2014–2019.

Fiscal Year	Activity and Materials	Cost (\$)		
		Commission	LGWCC	NCSU
2014-2015	Assess Existing Conditions and Plan Development	4,558		
	Building Exclosures and Planting	9,886		1,687
	Planting Assessment	3,286		
	Materials for Fence Exclosures		10,600	
	Travel / Boats / Miscellaneous Supplies	3,593		
2015-2016	Building Exclosures and Planting	9,886		1,687
	Planting Assessment	3,286		
	Materials for Fence Exclosures		10,700	
	Travel / Boats / Miscellaneous Supplies	3,568		
2016-2017	Building Exclosures and Planting	9,886		1,687
	Planting Assessment	3,286		
	Materials for Fence Exclosures		10,800	
	Travel / Boats / Miscellaneous Supplies	3,568		
2017-2018	Building Exclosures and Planting	9,886		1,687
	Planting Assessment	3,286		
	Materials for Fence Exclosures		10,900	
	Travel / Boats / Miscellaneous Supplies	3,568		
2018-2019	Building Exclosures and Planting	9,886		1,687
	Planting Assessment	3,286		
	Materials for Fence Exclosures		11,000	
	Travel / Boats / Miscellaneous Supplies	3,568		
Total Cost:		\$88,282	\$54,000	\$8,435
TOTAL PROJECT COST:		\$150,717		