

# Kerr Lake Vegetation Survey

October 2013

Report submitted by NC State University

## Background

Hydrilla (*Hydrilla verticillata*) is a non-native invasive submersed aquatic plant. This plant was first documented in Wake County, North Carolina in 1980. Initial infestations were confined to small ponds and lakes, however, by 1988 it had spread into Lake Gaston. The plant continued to spread across North Carolina and increased acreage in both the North Carolina and Virginia portions of Lake Gaston into the 1990's.

In the fall of 1992, hydrilla was documented in the North Bend Park portions of Kerr Lake. The first reports were of small patches in the back of one cove near a boat ramp. Because of the location (near the dam, and adjacent to Lake Gaston) it was thought that boats traveling between the two lakes had been the primary method of dispersion. Following surveys in this area, additional small patches (approximately 8 A total) were discovered in 1993. Other portions of Kerr Lake were not surveyed, however, some boat ramps in the NC portion of the lake were examined and no Hydrilla found. Treatments of the known locations of Hydrilla were started in 1993, using a contact herbicide Aquathol-K (endothall) plus a sinking agent Nalquatic. Based on information from NCDNR Aquatic Weed Control Program records the treatments were successful and only conducted in 1993 and 1994. In July 1996 after reports of weed problems in the Satterwhite Point area, a survey of that area was conducted. Several locations were found to contain Chara and Brittle Naiad (*Najas minor*). No additional information on surveys or treatments was found.

In the summer of 2009, there were reports of problematic Hydrilla infestations in the North Carolina portions of Kerr Lake. Additional reports in 2010 gave indication of an increasing problem in these areas. Paul McKenzie, (Vance County, NC Cooperative Extension Agent) sent several samples to NC State University for positive identification and organized a survey of the North Carolina portions of Kerr Lake mainly in the areas of Nutbush and Little Nutbush Creeks. A group of local volunteers and representatives of various governmental agencies participated and found Hydrilla in many of the areas surveyed. Reports from others indicated that hydrilla may be more widespread and actual locations and acreages were unknown. A full lake survey was conducted in the fall of 2011 indicating 698 A of Hydrilla.

After meeting with representatives of the USACE, NCWRC, and VDGIF, and others it was decided that a thorough survey of Kerr Lake was needed and NC State University was contracted to conduct the survey.

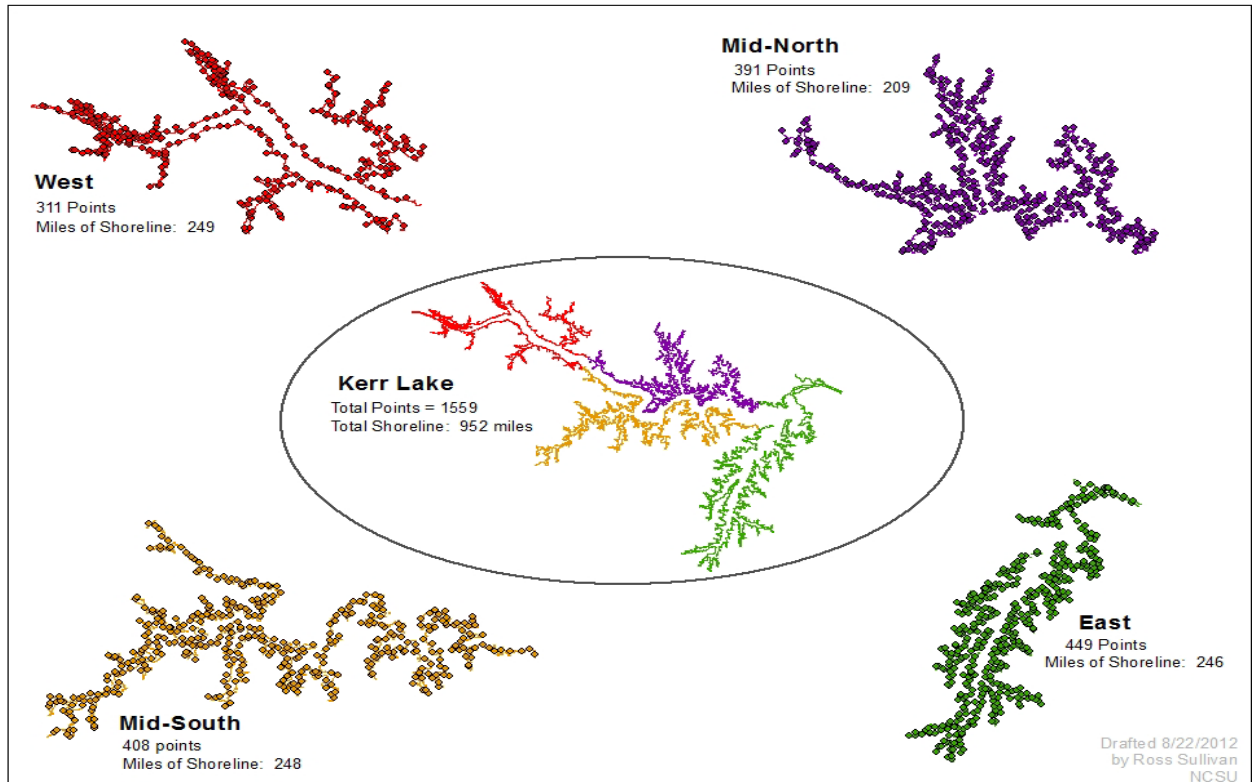
On October 31, 2013 approximately 13,000 triploid grass carp were put into the Nutbush and Little Nutbush areas based on the high occurrence of Hydrilla in these areas.

## **Methods**

The survey began September 17, 2013 and was completed on October 29, 2013. During the survey timeframe, the lake elevation ranged between approximately 297 and 298 feet msl. Shoreline use and lake digital map information was provided by USACE to be used in completing this survey.

Beginning in 2012, a point intercept method was incorporated in order to more accurately determine species presence/absence and assist in determining Hydrilla spread. A total of 1559 points were placed at an approximately 0.5 mile interval around the shoreline based on USACE shoreline shape file. Some of these points occurred in areas that were not accessible for various reasons including low water, behind culverts, below dam structure. Of the predetermined points, 1245 were actually sampled for vegetation in 2012 (1316 in 2013). The sample method included visual observation of area and 2 rake tosses at each point (or as close as possible to actual point). In addition, Sonar (same method as 2011) was used in areas where Hydrilla was found, along with hand drawn maps and notes. In addition, rake samples were

taken at two points around all boat ramps.



## Results

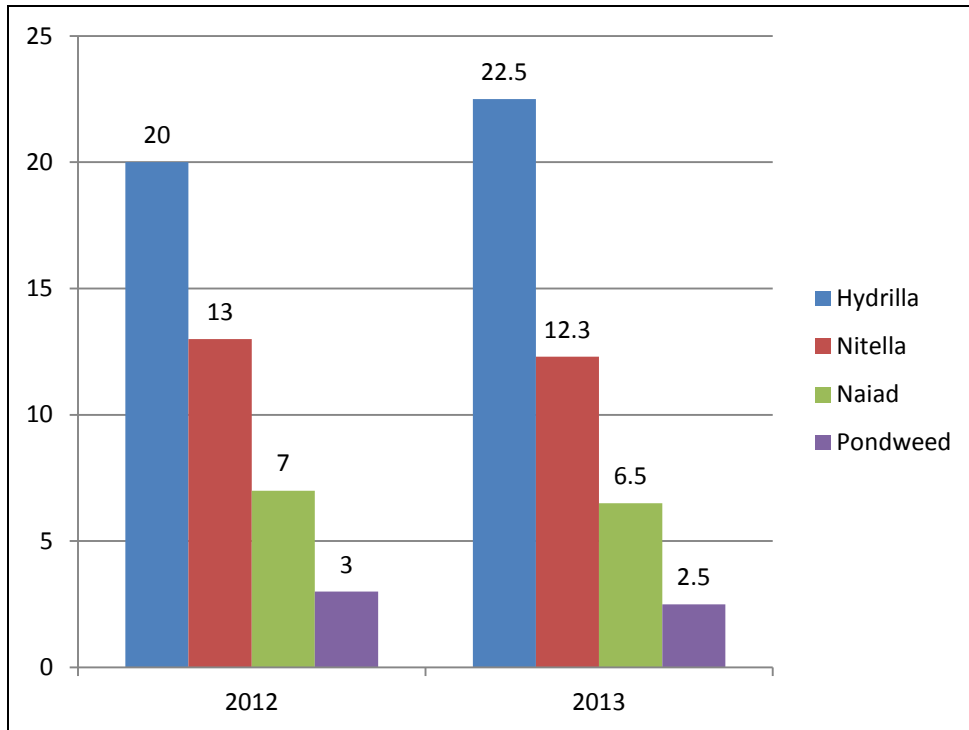
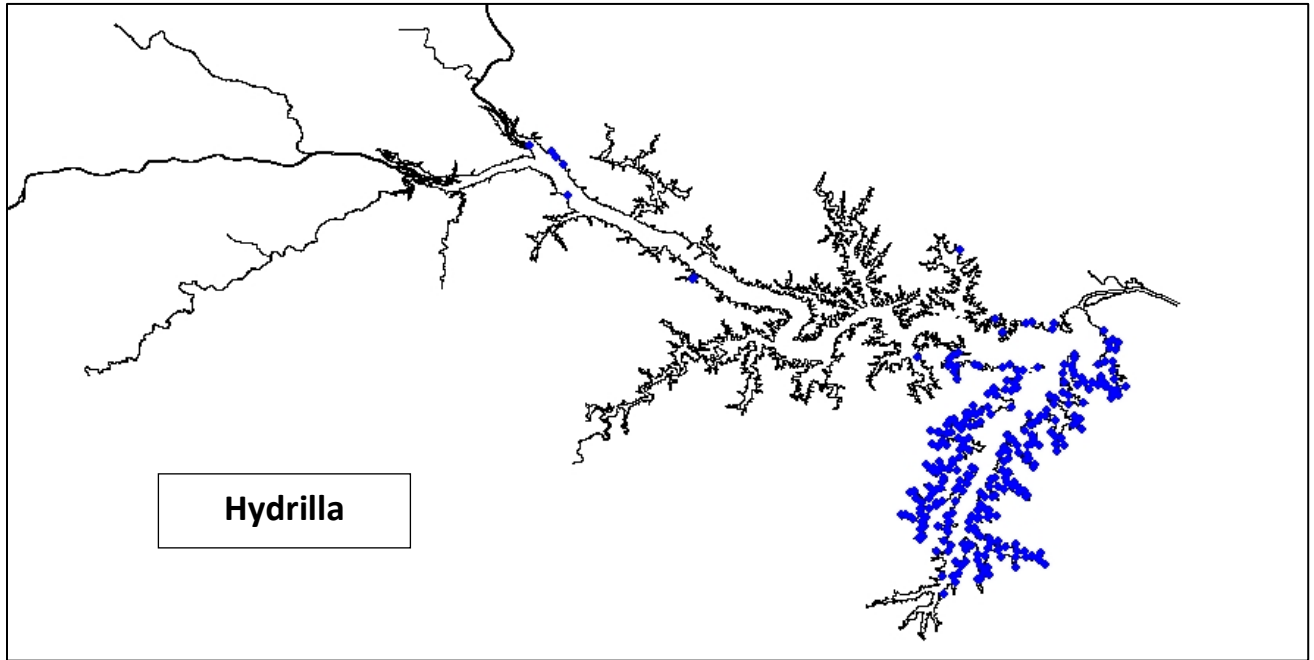
Over a 30+ day period, Hydrilla was observed as low growing, small clusters of plants as well as topped out surface mats in various locations throughout the survey. Hydrilla was the most frequent plant observed in areas where dense plant beds were present. Several other plant species were found in significant quantities in many locations throughout the lake. Native submersed plants included *Chara sp./Nitella sp.* (macroalgae), *Potamogeton diversifolius* (variable leaf pondweed), *Potamogeton pectinatus* (sago pondweed), *Najas guadalupensis* (southern naiad). Several locations also had *Najas minor* (brittle naiad) a non-native invasive species.

Because the SONAR unit defined areas of submersed plants without species identification, hand drawn maps were used to determine areas of Hydrilla infestations. The information was transferred from the maps into ArcGIS software and this information was converted to shapefiles and used to determine acreage. The information was then compared to the processed data from Contour Innovations and slight corrections made based on both sources.

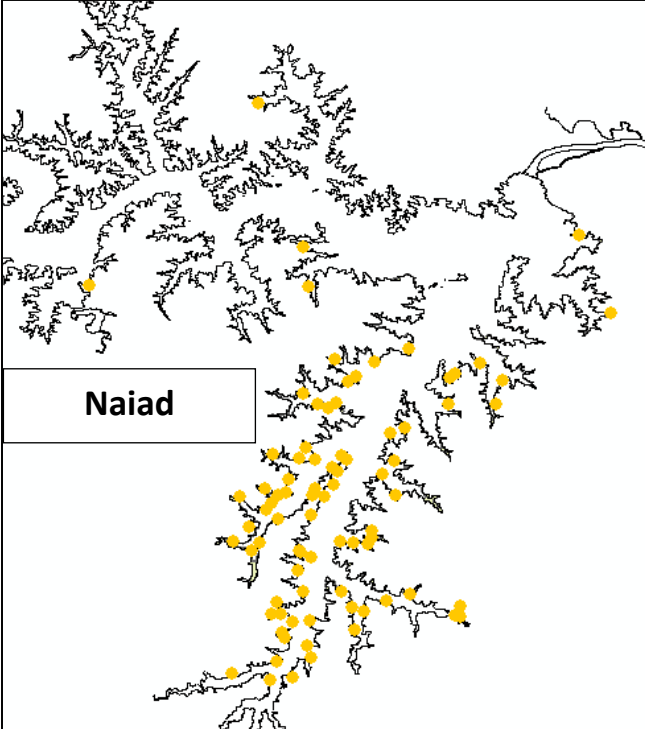
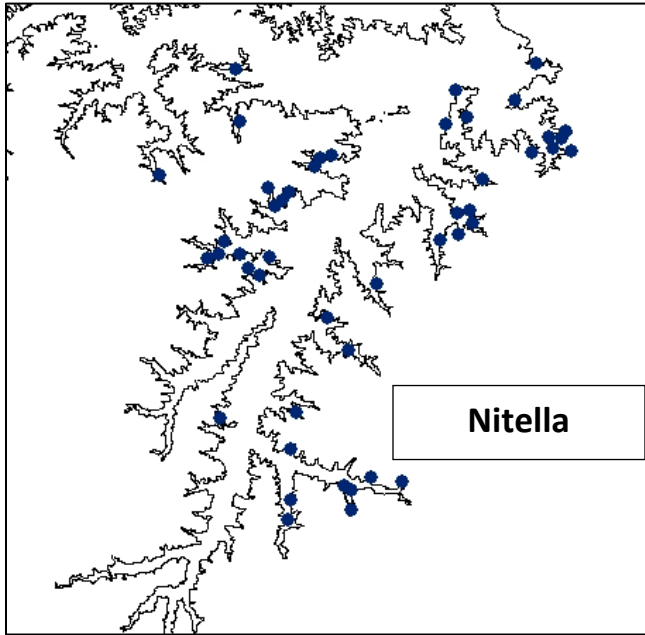
*A CD of the shapefile information is included.*

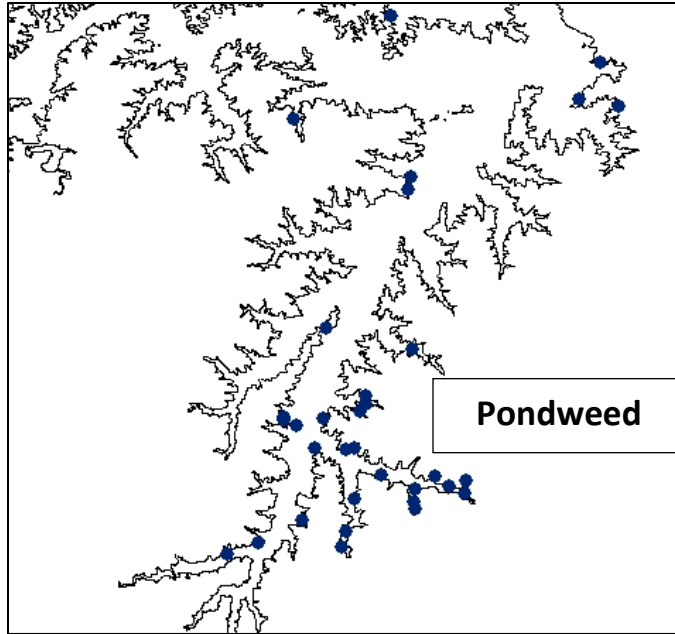
During the survey process it was noted that most of the Hydrilla infestations occurred in areas of high human use including State Parks, boat ramps, commercial marinas, and in areas of higher populations of people based on number of docks. As in 2011 large areas of undeveloped shoreline west of Nutbush Creek were found to contain almost no Hydrilla. It was noted in 2013 that Hydrilla has begun to spread west and north outside the Nutbush Creek area. One point on the North side in Eastland Creek had a small infestation (less than 0.4 acre) around several boat docks. It may have been transported to this area by boat props that had traveled into infested areas. Higher than usual water levels allowed more points to be surveyed in 2013, than in previous years. Areas around Stanton View contained significant acreages of Hydrilla similar to that seen in 2011. For the most part Hydrilla in this area was low growing and not as dense as that seen in the lower sections of the lake.

Hydrilla Point Location Map



Percent Plant Abundance by Species (based on 1245 points in 2012 and 1345 points in 2013)





### **Hydrilla Infestations in 2013:**

1. Little Nutbush Creek continues to have the largest continuous areas of shoreline containing Hydrilla; the back of numerous coves had extensive populations as well as many small scattered populations.
2. Nutbush Creek has several large populations of Hydrilla, but also large areas with Chara/Nitella and Naiads (esp. *Najas minor*).
3. North Bend Park the site of the original infestations has several small populations.
4. Isolated spots are beginning to be found further west than in previous years. These are small separated colonies that may allow additional spread into new areas.
5. Several areas where Hydrilla was documented in 2011 including: Staunton View ramp area, Clarksville Marina, and scattered locations along the south shore west of Clarksville bridges, had low growing sparse populations in 2013.
6. One fragment of curly leaf pondweed (*Potamogeton crispus*) was found in the Dan River section of the lake. This species is problematic in most areas where it occurs. Continued monitoring and surveys further up river may be needed.

Based on the information obtained during the survey, our estimated total acreage of Hydrilla in Kerr Lake is 1,115.3 acres, located mainly in Nutbush Creek and Little Nutbush Creek. Of the 228 acre increase in 2013, approximately 214 acres in the western part of the lake near the Staunton View area account for most of the difference. Hydrilla populations in this area have been noted in previous years and density will be extremely dependant on water level and flow in future years.



## Recommendations

Additional whole lake surveys should be conducted to determine spread and document impacts on public use areas and native plant populations. Frequency of these whole lake surveys could be based on random point surveys conducted annually.

Grass carp (*Ctenopharyngodon idella*) would be the cheapest management option for full lake hydrilla control. Normal stocking rates would be 15 fish / hydrilla vegetated acre. However, submersed native plants may also be controlled.

Contact herbicides applied by USACE approved applicators may be the best option for control in some areas. Certain sections of the currently infested North Carolina portion of the lake may be suitable for systemic herbicides, but water flow will limit their use. Any herbicide applications should be made by these approved applicators and reports containing acres treated, herbicides used and rates, evaluation of biomass reduction (treatment effectiveness), and other information should be made to the USACE for future determinations of treatments.

Signs should be placed at all boat ramp/marina locations to help limit unintentional spread in Kerr and to other water bodies. Information should also be provided to State Park visitors and others to aid in public awareness of invasive species.

Information should also be provided to private individuals with "lake front" property, and/or docks. This information could provide instructions for chemical treatments and proper identification of native and non-native plant species. In addition, a reporting system to track new infestations should be implemented. These individuals should be encouraged to rake out or otherwise remove floating mats in the fall to slow spread.

Public funds (unknown sources) should be used to treat in areas around public facilities including swimming areas and boat ramps. Repeat applications may be needed and applicators should be required to follow-up in order to reduce tuber formation.