

Kerr Lake Vegetation Survey

February 11, 2018

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.

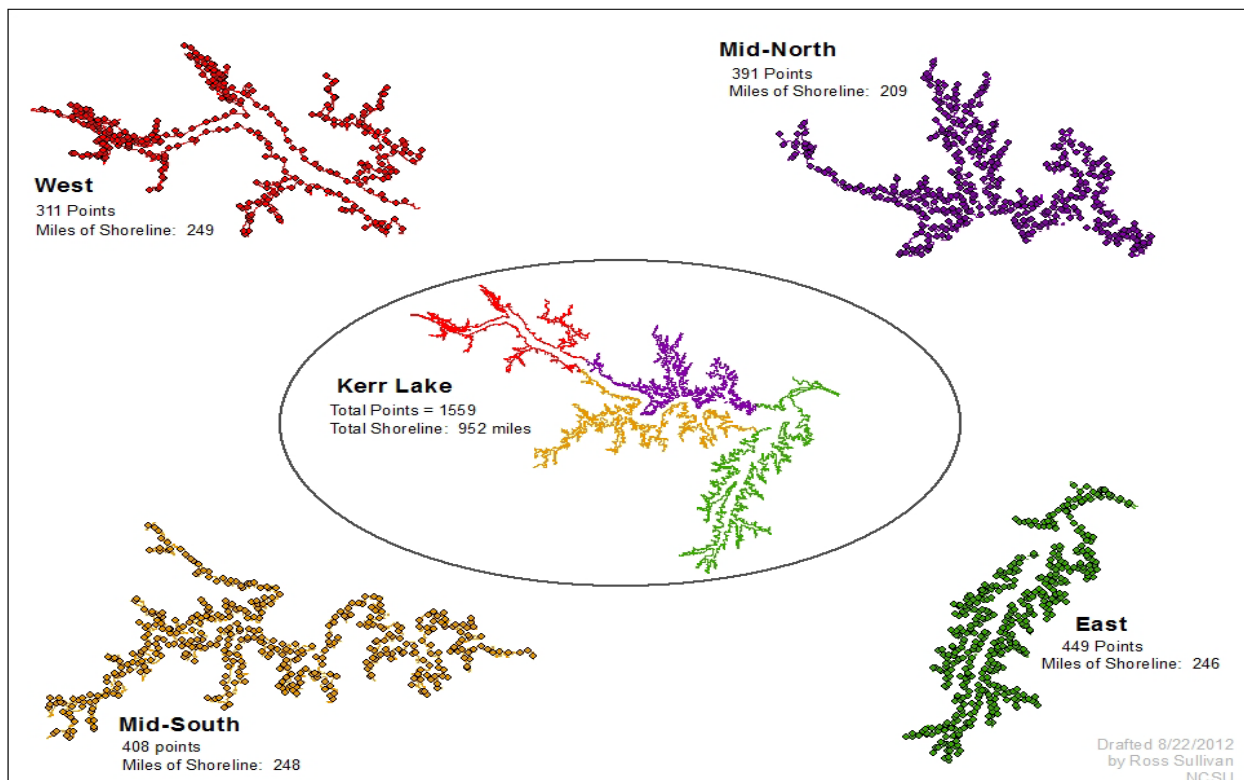
In the fall of 1992, hydrilla was documented in the North Bend Park portions of Kerr Lake. The first reports were of small patches in the back of one cove near a boat ramp. Because of the location (near the dam, and adjacent to Lake Gaston) it was thought that boats traveling between the two lakes had 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.

Methods

The survey began August 21, 2017 and was completed on November 11, 2017. During the survey timeframe, the lake elevation ranged between approximately 299 and 294 feet msl. During the survey time frame, low rain fall and falling lake levels proved a challenge. However, the survey was started on the western portion of the lake in 2017 (where we traditionally have more problems with shallow water) and we were able to complete the project. Shoreline use and lake digital map information was provided by USACE to be used in completing this survey.

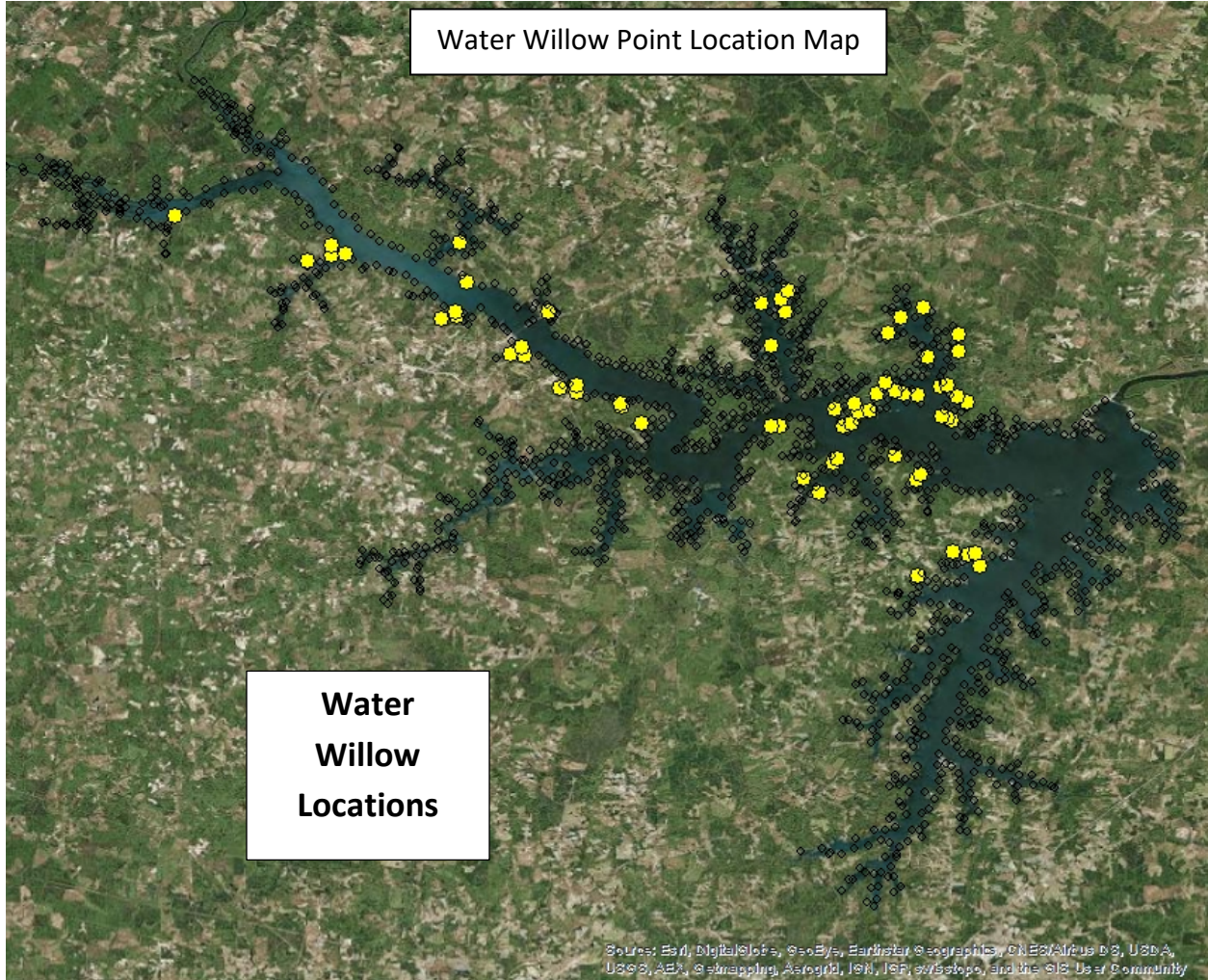
Beginning in 2012, a point intercept method was incorporated in order to more accurately determine species presence/absence and assist in determining Hydrilla spread. A total of 1559 points were placed at an approximately 0.5 mile interval around the shoreline based on USACE shoreline shape file. Some 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, 1298 were actually sampled for vegetation in 2017 (1245 in 2012, 1316 in 2013, 1336 in 2014, 1307 in 2015 1336 in 2016). 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

During the survey period, lake evaluations were continuously falling making navigation challenging. Sonar as in past years was adjusted to lake elevation 300 msl for accurate comparisons from year to year. In addition to rake toss sampling the shoreline was carefully examined to find plants that may have been exposed by falling water levels. As noted in previous reports, very few if any hydrilla plants are usually found in the range of elevation 298 - 296 the areas less than 2 foot in depth. The hydrilla typically found at depths greater than 6 foot should have been visible during the survey. However no submersed plants were found in any section of the lake. It is unknown as to how much if any weather influenced hydrilla and other plant growth in Kerr in 2017, other water bodies had similar populations as in previous years.

Water Willow Point Location Map



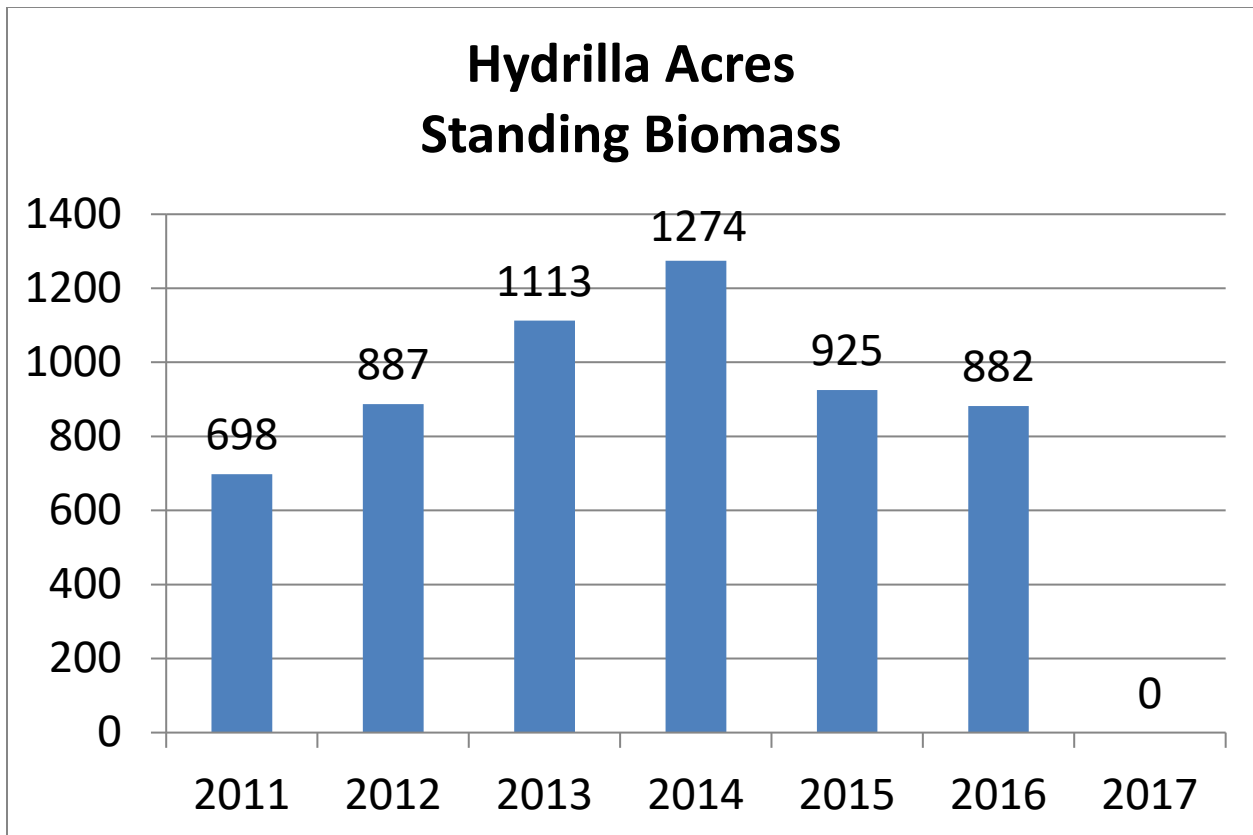
**Water
Willow
Locations**

Sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, Aero, Swapping, AeroGRID, IGN, IGF, e-Geomatics, and the GIS User Community

Notes from the 2016 survey:

1. Little Nutbush and Nutbush Creek proper have in previous years had large continuous areas of shoreline containing Hydrilla; the back of numerous coves had extensive populations as well as many small scattered populations. However in contrast to previous years no rooted or floating fragments of hydrilla were found.
2. With changing acreages of hydrilla, in order to more accurately describe the population, hydrilla acreage will be described as “Standing Biomass”.
NC Wildlife Resources also uses a term “Tuber Bank Acres” to determine stocking rates for grass carp. This measurement is the maximum acres of standing biomass within the past 7 years (estimating the expected life span of tubers in the sediment).
3. In 2016 we started trying to monitor water willow (*Justicia americana*) populations, continued monitoring of this desirable species will continue in future years. Expansion of this species was noted in 2017 and in cooperation with another Corps project; some new areas will be planted in 2018.

Based on the information obtained during the survey, no hydrilla was observed therefore acreage for 2017 is reported as 0 acres.



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.

Maintain grass carp (*Ctenopharyngodon idella*) populations based on stocking rates from Va and NC Wildlife officials. Current stocking rate for continued management is 1.5 fish / tuber bank acre. Tuber bank acre is defined as the maximum hydrilla acreage within the last 7 years. 2014 - 1274 acres X 1.5 fish = population of about 2000 fish as a minimum.

Contact herbicides may still be necessary in some areas with small isolated populations. These products should be applied by USACE approved applicators may be the best option for control in some areas. 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.