

AQUATIC PLANT MANAGEMENT PLAN
FOR
U.S. ARMY CORPS OF ENGINEERS, SAVANNAH DISTRICT
WATER RESOURCES PROJECTS
SOUTH CAROLINA AND GEORGIA

Appendix A

CY 2015 Update

Annual Aquatic Plant Treatment Plan

and

Summary of Previous Year's
Management Program

Aquatic Plant Treatment Plan CY 2015

New Savannah Bluff Lock and Dam

Periodic observations will be conducted to determine plant species, abundance, and distribution during the summer of 2015. Aquatic plants may be treated in the vicinity of the New Savannah Bluff Lock and Dam (NSBLD) using an appropriate plant specific herbicide whenever plant abundance has the potential to impact the operations of this facility. The Savannah District does not have the authority to perform aquatic plant management treatments beyond the boundaries of the NSBLD. Herbicide applications immediately upstream of the NSBLD will not reduce the water hyacinths' continued impacts to the boat ramp, courtesy dock, and buoy line since the source of the infestation extends well upstream of the area. As an alternative to herbicide applications, personnel from the J. Strom Thurmond Power Plant may alter flow rates over the spillway gates to remove the accumulation of water hyacinth or the upstream buoy line may be modified or temporarily removed to prevent the accumulation of water hyacinth on the buoy line.

J. Strom Thurmond Lake

The lake level remained at or near normal pool elevation much of the 2014 growing season. Plant growth varied greatly from area to area. In most areas, the hydrilla seldom exceeded three feet in height and was not problematic during the peak of the recreation season.

Total funding for all Thurmond Lake programs has been substantially reduced for fiscal year 2015. The J. Strom Thurmond Project staff will monitor hydrilla growth beginning in May. By mid to late July, treatment needs will be identified and prioritized. It is anticipated that funding may only be available to treat major Corps boat ramps if they are substantially impacted by nuisance aquatic vegetation. The treatment plans will be coordinated with the GADNR, SCDNR, local agencies, and affected outgrantees prior to implementation.

Treatment priorities will be established in accordance with the Aquatic Plant Management plan for U.S. Army Corps of Engineers, Savannah District Water Resources Project, South Carolina and Georgia (APMP). The APMP is available on the Thurmond Project website:

<http://www.sas.usace.army.mil/Portals/61/docs/lakes/thurmond/AquaticPlan.pdf> .

Either Reward with K-TEA or Komeen with Reward will be applied dependant upon site location, desired level of control, and cost per acre. It is anticipated that only one herbicide application per area will be made in CY 15.

Approximately 200 water hyacinth plants were found in the Clarks Hill Park area of J. Strom Thurmond Lake during September 2008. The plants were removed by hand from the reservoir. No water hyacinth plants have been found since 2008. The lower

portion of J. Strom Thurmond Lake from Little River, GA to the dam will be monitored for water hyacinth throughout the 2015 growing season. Plants will be removed and disposed of or treated with appropriate aquatic plant herbicides depending upon the extent of infestation. Treatment(s), if necessary, will be coordinated with the GADNR, SCDNR, local agencies, and affected outgrantees prior to implementation.

In 2010, approximately 32 acres of water primrose (*Ludwigia spp.*) and 10 acres of alligatorweed (*Alternanthera philoxeroides*) were discovered growing in the Little River, SC and Dry Fork Creek portions of the lake. In 2011, an additional 62.2 acres of alligator weed was found in Little River, SC and 5.1 acres Big Creek, GA. These plants have continued to expand their distribution within Little River, SC. Plant growth will be monitored in 2015. No herbicide applications are anticipated unless these plants impact public recreation areas.

A large population (approximately 600-acres) of slender pondweed (*Potamogeton pusillus*) was present in the Savannah River headwaters of J. Strom Thurmond Lake (RBR tailwater) in 2008 and again in 2012. The abundance of this plant appears to be in direct response to drought conditions and falling water levels in J. Strom Thurmond Lake. The plant proved to be problematic for pumped storage operations at Richard B. Russell Dam in 2012. In response, 251 acres of slender pondweed were treated in July and August, 2012 with Reward and Komeen. Surveys will be conducted during the 2015 growing season and herbicide applications may be made if appropriate. Selection of appropriate chemicals, acreage treated, and the timing of treatments will be determined by assessing the distribution and abundance of the plants.

Adjoining property owners and other agencies may treat nuisance aquatic vegetation in accordance with the APMP.

In September 2013, the University of Georgia, at the request of the Corps, completed a user survey titled "Investigating Stakeholder Perceptions of Aquatic Plant Management on J. Strom Thurmond Lake". Survey's primary goal was to sample five user groups (fishing license holders, state waterfowl stamp holders, registered boaters, campground visitors, and shoreline permit holders) from surrounding Georgia and South Carolina counties to evaluate their knowledge of Avian Vasculopathy (AVM) and opinions regarding potential management actions to control nuisance aquatic vegetation, mainly hydrilla. Complete results of the survey are available on the Thurmond Project website:

http://www.sas.usace.army.mil/Portals/61/docs/lakes/thurmond/UGA%20Perception%20Survey_Final%20Report.pdf. Generally, users were supportive of stocking grass carp to control hydrilla. Intentions are to develop a separate plan to reduce the impacts of AVM to bald eagles and waterfowl. Funding has been requested in FY 15 to initiate an Environmental Assessment of proposed actions, however, it has not been approved.

Richard B. Russell Lake

Hydrilla was first discovered in Richard B. Russell Lake in the McCalla peninsula area during summer 2002 but has not reoccurred at this location since this time. Approximately one-acre of hydrilla was discovered in Bond Creek, a tributary of the Savannah River arm of Richard B. Russell Lake, in January, 2007 and was again found in 2009. This area has been surveyed annually since 2007, but the hydrilla has not increased in distribution or abundance. No hydrilla was detected in RBR Lake in 2010, 2011, 2012, 2013 or 2014. Brazilian elodea has consistently been detected in the same areas of Richard B. Russell Lake for the past 5-years and the abundance and distribution of this plant appears to be very stable. Approximately 5-10 acres of Brazilian elodea is still present in the Savannah River within 1 to 5 miles downstream of Hartwell Dam. Boat surveys will be conducted periodically throughout the summer and fall of 2015 to determine plant distribution and abundance. Most rangers at the Richard B. Russell Project have been trained to identify and report aquatic plants of concern that would be expected to occur in this area. No treatment is currently planned for 2015.

Hartwell Lake

Aquatic plants have not become abundant in Hartwell Lake. Therefore, no treatment program is planned for CY 15. However, there is concern that hydrilla will be moved from J. Strom Thurmond Lake or Keowee Lake into Hartwell Lake. In an effort to identify the spread of hydrilla as early as possible, boat surveys will be conducted periodically throughout the summer and fall. Most rangers at the Hartwell Project have been trained to identify and report aquatic plants of concern that would be expected to occur in this area. Additionally, the Lake Hartwell Association membership has agreed to report any aquatic vegetation observed.

If hydrilla is located in Hartwell Lake, it is the intent of the Corps of Engineers to treat all known hydrilla infestations during CY 15 using herbicides to minimize the spread of hydrilla within the impoundment. However, if significant infestations are located before scheduled treatment, all treatment areas will be prioritized based on criteria established in the APMP.

Unanticipated taste and odor issues believed related to a high density of blue-green algae in the Twenty-Six Mile Creek tributary of Hartwell Lake resulted in the need for Anderson Regional Joint Water System (ARJWS) to treat approximately 160 acres in the vicinity of the ARJWS water intake. This treatment was permitted in accordance with the APMP and was conducted by a licensed applicator in September 2014. Both Algimycin and Phycomycin were used in portions of the treatment area. ARJWS has retained the services of aquatic plant management consultants to closely monitor the density of blue-green algae in the vicinity of their intake in Spring and Summer 2015. According to ARJWS, treatments will be conducted in 2015 if necessary to combat taste and odor issues, and the appropriate permits will be considered under the APMP at the time of application.

Aquatic Plant Management Activity Summary CY 2014

New Savannah Bluff Lock and Dam (NSLBD)

Aquatic plant populations in the upstream embayment were monitored periodically throughout the growing season. The following aquatic plants were identified: elephant ear, water hyacinth, elodea, fanwort, pickerelweed, and cattail. As a result of higher river flows, these plants did not impact operations at the NSBLD.

J. Strom Thurmond Project

The growth rate and distribution of hydrilla was monitored from May through October. Plant growth varied greatly from area to area. In most areas with, the hydrilla seldom exceeded three feet in height and was not problematic during the main recreation season. During October and November, use at some Country boat ramps was impacted by hydrilla. Funds were not available in CY 14 to perform any herbicide applications.

Two permits were issued to adjoining property owners to treat hydrilla (2 ac.) around their docks. All herbicide applications were made by a licensed applicator using herbicides approved for the treatment of aquatic plants.

In October and early November of 2010, an extensive boat survey of the lake was conducted with assistance from Georgia Department of Natural Resources, South Carolina Department of Natural Resources, and Warnell School of Forestry and Natural Resources, University of Georgia. The lake was divided into 9 separate survey routes and sample points were established every 1,760 feet (1/3 mile) along the entire lake shoreline and included selected islands. These points were surveyed for the presence or absence of hydrilla. The survey teams used a two-sided metal garden rake with a rope to drag the lake bottom perpendicular to the shoreline to a depth of approximately 20 feet. If hydrilla was detected visually, the use of the rake was not required. Plant density estimates were produced by surveying 77 transects perpendicular to the shoreline at randomly selected survey points where hydrilla was detected during the rake sampling. These density samples were collected using a BioSonics DT-X Echosounder with a 420 khz digital transducer. BioSonics Visual Acquisition software was used to analyze the echograms and estimate plant density at each sample point. Findings were mapped in ArcView using 1-foot bathymetry data acquired from Navionics, Inc.

Hydrilla was present along 641 miles of shoreline. The majority of plant growth occurred in water depths less than 15 feet. On average, hydrilla was found to occupy 44% of the available habitat where it is present. The 2010 survey results are as follows:

*	Project Total	Georgia	South Carolina
Estimated Hydrilla Coverage	4,959 acres	3,392 acres	1,567 acres
Potential Acreage where Hydrilla is Present	11,271 acres	7,708 acres	3,563 acres
Potential Acreage where Hydrilla is Absent	7,579 acres	5,219 acres	2,360 acres
Not Surveyed (shallow areas not accessible by boat, unmarked shoals or un-surveyed islands)	1,939 acres	1,242 acres	697 acres
Total Available Acreage (330' msl to 315' msl)	20,790 acres	14,170 acres	6,620 acres

*All acreage estimates were determined by estimating the area between elevations 330' msl and 315' msl using 1-foot contour bathymetry data

During the 2011 growing season, a limited survey of areas near known hydrilla populations was conducted to determine the presence or absence of new hydrilla growth. Additional plant populations were found along 12.2 miles of shoreline in South Carolina and 6.8 Georgia. Areas where hydrilla had been detected previously were not resurveyed in 2011. Due to the low lake level, a survey to determine the extent of hydrilla migration was not conducted in 2012. A survey was not conducted in 2013 due to high lake level and the abundance of decaying terrestrial vegetation. During the 2014 growing season, a limited survey of areas near known hydrilla populations was conducted to determine the presence or absence of new hydrilla growth. Additional plant populations were found along 6.11 miles of shoreline in South Carolina.

Maps showing the known locations of hydrilla infestations are on file at the J. Strom Thurmond Lake Operations Project Manager's Office. A map is also posted on the J. Strom Thurmond Project website:
http://www.sas.usace.army.mil/Portals/61/siteimages/Lakes/thurmond/Hydrilla_Dist_2014.pdf

In 2010, approximately 32 acres of water primrose (*Ludwigia spp.*) and 10 acres of alligatorweed (*Alternanthera philoxeroides*) were discovered growing in the Little River, SC and Dry Fork Creek portions of the lake. In 2011, an additional 62.2 acres of alligator weed was found in Little River, SC and 5.1 acres Big Creek, GA. These plants have continued to expand their distribution within Little River, SC. Plant growth did not impact public recreation area uses.

In 2014, slender pondweed (*Potamogeton pusillus*) which was present in 2012 in the Savannah River headwaters of J. Strom Thurmond Lake (RBR tailwater) was not problematic. Therefore, no treatments were necessary.

Richard B. Russell Project

Periodic boat surveys of the lake were performed throughout the growing season. Sparse patches of Brazilian Elodea (*Egeria densa*) were present on the Savannah River 1 to 5 miles below Hartwell Dam. No hydrilla was detected in Richard B. Russell Lake during the 2014 growing season. Aquatic plant growth has not reached nuisance levels requiring treatment.

Hartwell Project

Periodic boat surveys of the lake were performed throughout the growing season. The distribution and abundance of water primrose in Eighteen Mile Creek does not appear to have increased relative to previous years.

Taste and odor issues were reported at multiple municipal water intakes in Hartwell Lake during late Summer and Fall of 2013 and the Spring and Summer of 2014. In response to these drinking water issues, Anderson Regional Joint Water System (ARJWS) treated approximately 160 acres in the vicinity of their water intake located on the Twenty-Six Mile Creek tributary of Hartwell Lake. This treatment was permitted in accordance with the APMP and was conducted by a licensed applicator in September 2014. Both Algimycin and Phycomycin were used in portions of the treatment area.