

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

Appendix A

CY 2016 Update

Annual Aquatic Plant Treatment Plan

and

Summary of Previous Year's
Management Program

Aquatic Plant Treatment Plan CY 2016

New Savannah Bluff Lock and Dam

Periodic observations will be conducted to determine plant species, abundance, and distribution during the summer of 2016. 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 and 2015 growing seasons. 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 2016. 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 dependent 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 2016.

Existing populations of slender pondweed (*Potamogeton pusillus*), water primrose (*Ludwigia spp.*) and alligatorweed (*Alternanthera philoxeroides*) will continue to be monitored in 2016. No herbicide applications are anticipated unless these plants impact public recreation areas or operations to the pump storage at Richard B. Russell Dam. Selection of appropriate chemicals, acreage treated, and the timing of treatments will be determined by assessing the distribution and abundance of the plants. The treatment plans will be coordinated with the GADNR, SCDNR, local agencies, and affected outgrantees prior to implementation.

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

The Avian Vacuolar Myelinopathy Plan (AVMP) and associated Environmental Assessment being finalized in 2016 are not intended to replace the APMP. The AVMP outlines procedures to reduce or eliminate impacts of AVM specifically on J. Strom Thurmond Lake.

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. 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 2016.

Hartwell Lake

Aquatic plants have not become abundant in Hartwell Lake. Therefore, no treatment program is planned for CY 16. 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 16 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.

Taste and odor issues 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 perform several treatment actions in the vicinity of their water intake in 2014 and 2015. 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 2016. According to ARJWS, treatments will be conducted in 2016 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 2015

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 December, use at some County boat ramps was impacted by hydrilla. Funds were not available in CY 15 to perform any herbicide applications.

Three permits were issued to adjoining property owners to treat hydrilla (5.5 ac.) and two permits were issued to treat water primrose (2.5 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, and again in September and early October of 2015, extensive boat surveys of the lake were 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 along the entire lake shoreline and included selected islands and shoals. 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 15 to 20 feet. Plant density estimates were produced by surveying transects perpendicular to the shoreline at randomly selected survey points where hydrilla was detected during the rake sampling. During the 2010 survey, these density samples were collected using a BioSonics DT-X Echosounder. BioSonics. Visual Acquisition software was used to analyze the echograms and estimate plant density at each sample point. During the 2015 survey, density samples were collected with either a Lowrance High Definition System (HDS) consumer echosounder or Lowrance Elite CHIRP consumer echosounder. Navico BioBase, a signal processing software designed specifically for aquatic plant and bathymetry surveys using recreational acoustic equipment 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.

The following table compares the survey sampling method between the 2010 and 2015 surveys:

	2010 Survey	2015 Survey
Number of Routes	9	9
Distance between plant distribution survey stations	1/3 Mile	1/2 Mile
Total plant distribution points surveyed	3,018	2,319
Number of plant density survey points	77	70
Maximum lake elevation during survey period	326.36' msl	331.37' msl
Minimum lake elevation during survey period	324.12' msl	324.75' msl

The following table compares the findings of both surveys:

	2010 Survey	2015 Survey
Acres of available habitat (330 msl - 315 msl)	20,720	20,720
Total acres where hydrilla is present	11,271	10,644
Estimated plant density	44%	22.2%
Total acres of hydrilla	4,959	2,363
Percentage of available habitat occupied by hydrilla	24%	11%
Percentage total lake surface impacted by hydrilla (Normal summer elevation - 330' msl)	7.0%	3.3%
Acres not surveyed	1,939	1,250

*All acreage estimates were determined by estimating the area between elevations 330' msl and 315' msl using 1-foot contour bathymetry data. Areas that were inaccessible by boat due to low lake levels were not surveyed.

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 2015, 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 2015 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 since the Summer of 2013. Taste and odor issues 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 perform several treatment actions in the vicinity of their water intake. These treatments were permitted in accordance with the APMP and were conducted by a licensed applicator in the Spring and Summer of 2015. Both Algimycin and Phycomycin were used in portions of the treatment area.