US Army Corps of Engineers
Mobile District

Aquatic Plant Management Plan

For

U.S. Army Corps of Engineers, Mobile District,

Apalachicola-Chattahoochee-Flint Rivers Project:

Walter F. George Site, Woodruff/Seminole Site, and George W. Andrews

February 2016

Prepared by: ACF Rivers Project Aquatic Plant Manager

Content

Appendices

1.0 PURPOSE, HISTORY, AND NEED FOR ACTION

Aquatic plants are an important component of a well-balanced aquatic ecosystem by providing valuable habitat for numerous animal species including: insects, fish, mammals, and birds. Invasive aquatic plant species can become a nuisance when they don't have competition from other plants and animals. This typically occurs with aquatic plants that are non-native to the area and don't have any control pressures such as: diseases and herbivory. Uncontrolled growth can interfere with authorized uses of a water body like: hydropower, navigation, recreation, and wildlife management. The Aquatic Plant Management Plan (APMP) will describe plans for managing aquatic vegetation on the Apalachicola-Chattahoochee-Flint (ACF) Rivers Project. Annual plans for Walter F. George Site, Woodruff/Seminole Site, and George W. Andrews Lake can be found in Appendix A.

Aquatic plant management was briefly addressed at the ACF in the "Lake Seminole and Jim Woodruff Lock and Dam, AL, FL, and GA, Operation and Maintenance Final Environmental Impact Statement, 1976", "1979 Environmental Statement, Walter F. George Lock, Dam, and Lake, Alabama and Georgia, Operation and Maintenance." Additional aquatic plant management is discussed in the Environmental Statement titled "Aquatic Plant Control Program, Mobile District, Final Environmental Impact Statement, 1978." These three documents discuss the treatment of water hyacinth (*Eichhornia crassipes*) and alligatorweed (*Alternanthera philoxeroides*) using 2,4-D, and biological agents' alligatorweed flea beetle (*Agasicles hydrophila*) and alligatorweed stem borer moth (*Vogtia malloi*). Over the years additional invasive plants have become problematic including hydrilla (Hydrilla verticillata), Eurasian watermilfoil (*Myriophyllum spicatum*), giant cutgrass (*Zizaniopsis miliacea*), water primrose (*Ludwigia hexapetala*), common salvinia (*Salvinia minima*), Cuban bulrush (*Oxycaryum cubense*), and giant cane (*Arundo donax*).

Hydrilla was first detected in 1993 in the southern end of the lake at East Bank boat ramp. In 1994, more hydrilla was discovered north of Soapstone Creek. Herbicide treatments and monitoring didn't reveal any expansion from 1994-2001. Several new populations of hydrilla were found scattered around the lake in 2002. A 2006 survey showed an expansion to 2,400 acres. In addition to hydrilla other plants have become a nuisance and require management.

In 2007, the "Environmental Assessment for the Release of Triploid Grass Carp for Hydrilla Management, Walter F. George Lake, Alabama and Georgia (EA)" was completed for the management of hydrilla and other aquatic plants. The EA recommended an Integrated Plan for managing aquatic plants using herbicides, triploid grass carp (*Ctenopharyngodon idella)*, and establishment of native aquatic plants. The goal of the Integrated Plan is to maintain 12 grass carp per acre of hydrilla. 13,440 grass carp were released in August 2007 and an additional 5,200 released in

September 2009. The acreage of hydrilla began to decline until 2013 when it began to increase. As a result of grass carp mortality the Corps stocked 12,000 additional grass carp in 2015.

Since the impoundment of Lake Seminole in 1957 over 900 species of wetland and aquatic plants have become established. Several of these species have become problematic mainly: hydrilla, water hyacinth, Limnophila (*Limnophila sessiliflora*), giant cutgrass, Eurasian watermilfoil, and Cuban bulrush. Aquatic plants have covered as much as 55% of the lake surface over the years. Hydrilla is the most problematic and was first detected at the Woodruff/Seminole Site in 1967.

In 1998, the "Lake Seminole, FL-GA-AL, Hydrilla Action Plan" was released as the final supplement to the Master Plan and Environmental Impact Statement. The Hydrilla Action Plan (HAP) is the guiding document for hydrilla management at the Woodruff/Seminole Site. The recommended plan incorporates the use of confined grass carp, herbicide drip system, mechanical harvesting, hydrilla fly releases/monitoring, and management with herbicides. The HAP does not address other address other nuisance aquatic plant management activities other than in general terms of acceptable percent coverage in the four management compartments. Management of these types of aquatic plants was addressed in the two earlier EISs:

1. "Lake Seminole and Jim Woodruff Lock and Dam, AL, FL, and GA, Operation and Maintenance Final Environmental Impact Statement, 1976"
2. "Aquatic Plant Control Program, Mobile District, Final Environmental Impact Statement, 1978."

Maps of the known distribution of aquatic plants are found in Appendix B.

2.0 AFFECTED ENVIRONMENT

2.1 General Project Descriptions

Walter F. George, George W. Andrews, and Woodruff/Seminole are multipurpose project operated and maintained by the U.S. Army Corps of Engineers. Walter F. George and George W. Andrews are located on the Chattahoochee River, and Woodruff/Seminole is located where the Chattahoochee and Flint Rivers meet to form the Apalachicola River. The Apalachicola River now forms downstream of Jim Woodruff Dam.

At normal pool, Walter F. George Lake has a surface area of 45,180 acres, George W. Andrews Lake (1,540 acres), and Lake Seminole (37,500 acres). Water levels in the lakes are relatively stable except during droughts or high rain events.

The temperature of the area is mild due to the moderating effects of the Gulf of Mexico, and average around 65ºF annually. Winter temperatures are subject to wide variations with periods below freezing usually not exceeding 48 hours. The average frost-free season exceeds 200 day/year. Most aquatic plants go into a short dormancy period or die back around November and December.

The individual project Master Plans provide more detailed information of each project. These documents are available at the Site Managers Office of each project.

2.2 LAKE USES

All three Corps lakes provide commercial and recreational vessel navigation passage through their Locks. Walter F. George and Woodruff/Seminole also provide hydroelectric power.

All Corps lakes are used extensively for water-based recreation including fishing, boating, bird watching, and skiing. Hunting opportunities are available on Walter F. George and Woodruff/Seminole. Public recreation areas are operated by the Corps, States, county and city governments, U.S. Fish and Wildlife Service, and private concessionaires.

2.3 BIOLOGICAL COMMUNITIES

Walter F. George, Woodruff/Seminole, and George W. Andrews support fish populations typical of southeastern lakes. Predominate game fishes are largemouth bass, bream, crappie, catfish, hybrid bass, and striped bass. The lakes are home to forage species such as gizzard shad, threadfin, and mullet.

Migratory waterfowl and resident waterfowl use the lakes as well, particularly Walter F. George and Woodruff/Seminole. Some common waterfowl are coots, Canada goose, bluebills, canvasback, loons, cormorants, wood duck, teal, gulls, White pelican, and Wood stork. Shorebirds include blue and green herons, kingfishers, and egrets. Bald eagles and osprey are common raptors that feed on the lakes.

Various species of reptiles and amphibians including American alligator, water snakes, water moccasin, various hard and soft shell turtles. Various mammal communities utilize the lakes including beaver, deer, wild hogs, and the occasional river otters being.

Federally listed species that utilize the shoreline or water of these lakes are: Wood Stork (*Mycteria Americana*), Purple Bankclimber mussel (*Elliptoideus sloatianus*), Gulf Moccasinshell mussel (*Medionidus penicillatus*), Oval pigtoe mussel (*Pleurobema pyriforme*), Shinyrayed pocketbook mussel (*Lampsilis subangulata*), Fat threeridge mussel (*Amblema neislerii*). Species descriptions, range, and recovery plans can be found here: http://www.fws.gov/endangered/species/index.html

State listed species include: Alabama shad (*Alosa alabamae*), Bluestripe shiner (*Cyprinella callitaenia*), Bluefin killifish (*Lucania goodei*), Halloween darter (*Percina*

crypta), Ironcolor shiner (*Notropis chalybaeus*), Alligator snapping turtle (*Macrochelys temminchii*), American alligator (*Alligator mississippiensis*), Osprey (*Pandion haliaetus*), Snowy egret (*Egretta thula*), White Ibis (*Eudocimus albus*), Wood Stork (*Mycteria Americana*), Purple Bankclimber mussel (*Elliptoideus sloatianus*), Gulf Moccasinshell mussel (*Medionidus penicillatus*), Oval pigtoe mussel (*Pleurobema pyriforme*), Shinyrayed pocketbook mussel (*Lampsilis subangulata*), Fat threeridge mussel (*Amblema neislerii*),. http://myfwc.com/wildlifehabitats/imperiled/; http://www.georgiawildlife.com/node/1366; http://alnhp.org/track_2013.pdf.

None of the actions in this plan are not expected to cause any adverse impacts to any of the federal or state listed species that are found in or around the lakes.

3.0 TREATMENT ALTERNATIVES FOR WALTER F. GEORGE SITE AND GEORGE W. ANDREWS LAKE

3.1 GENERAL

A complete assessment of alternative treatment methods are found in the "Environmental Assessment for the Release of Triploid Grass Carp for Hydrilla Management, Walter F. George Lake, Alabama and Georgia" here.

3.2 INSECTS AS BIOLOGICAL CONTROL AGENT ALTERNATIVE

Several insect species have been identified that feed on hydrilla. Only a few species have proven effective in the U.S.: the Australian stem-boring weevil (*Bagous hydrillae*) and leaf-mining fly (*Hydrellia pakistanae*). The stem boring weevil (*B. hydrillae*) was released in downstream in Lake Seminole, but failed to become established in the lake. The leaf-mining fly (*H. pakistanae*) has become established downstream in Lake Seminole, but fly damage has not reduced biomass or surface matting. Due to the presence of the Monoecious biotype, it is unlikely that there is hydrilla in the winter for the fly larvae to survive.

3.3 CONFINED RELEASE OF GRASS CARP ALTERNATIVE

Following the successful installation of electric barriers to confine triploid grass carp (*Ctenopharyngodon idella*) in Lake Seminole this alternative was considered for Walter F. George Lake. The confined areas in Lake Seminole are less than 1000 acres and are less than six feet deep at the barrier locations. Walter F. George Lake is considerably different than Lake Seminole. First, the tributaries of Walter F. George Lake are much deeper and wider than Lake Seminole which would significantly increase the construction, maintenance, and operating cost of the barrier. Second, high flow conditions would likely be problematic for the construction of a rigid barrier.

3.4 MECHANICAL HARVESTING ALTERNATIVE

Mechanical harvesting uses specially designed machines that cut and haul aquatic vegetation. The average harvester has a limited depth of cut and provides only short-term control. Significant fragmentation can occur during operation of the harvester that spreads the plant. The remaining plant material (roots, tubers, and stems) continue to grow. In areas of heavy vegetation, significant time is spent traveling back to boat ramps to off-load biomass which must be disposed of off-site.

3.5 LAKE DRAWDOWN ALTERNATIVE

This alternative looked into lowering the lake level 10 feet from the normal pool of 190 mean sea level (msl) to 180 feet msl. This would expose 14,600 acres of the lake bottom. Drawing down the lake would have to be accomplished over the course of months and would have to stay at 180 feet msl for an extended period of time to dry out tubers in the soil. During the drawdown timeframe water-based recreation would be almost eliminated with only bank fishing available. Shoreline permit holders would not be able to launch boats from their docks.

This drawdown would create conditions that would cause hydrilla to become established in waters that was once too deep. When the water is raised the hydrilla would be established in water greater than 10 feet.

3.6 NO ACTION ALTERNATIVE (i.e. MINIMUM CHEMICAL TREATMENT)

This alternative would provide chemical management of submersed aquatic plants on the lake within the confines of the anticipated annual budget. This alternative would be a reduced level of treatment and would treat approximately 230 acres.

3.7 MAXIMUM CHEMICAL TREATMENT ALTERNATIVE

The Maximum Chemical Treatment (MCT) would use herbicides to treat 2,800 surface acres, with certain areas treated twice. This alternative does not take existing budget constraints into account. The MCT would assume that additional funds are provided without diverting existing funds.

3.8 FLOW-ASSISTED HERBICIDE DELIVERY SYSTEM ALTERNATIVE

This alternative would consist of water and land based injection sites. At these sites, herbicide would be injected directly into the current upstream of the target area. The goal would be to have the herbicide of both injection sites meet simultaneously downstream at the mouth of the embayment. The annual treatment would be dependent on the flow of the current, depth of the water, temperature of the water, and half-life of the herbicide. Due to the deep river channel, channelization is likely to occur reducing the horizontal dispersal of the herbicide.

3.9 RELEASE OF TRIPLOID GRASS CARP ONLY ALTERNATIVE

20-22 fish per hydrilla acre would be stocked in the lake. Control would rely entirely on the feeding behavior of the grass carp. No herbicides would be used. Stocking grass carp is an efficient strategy to manage hydrilla, however, management may not occur at the priority areas listed in the Environmental Assessment.

3.10 Integrated Plan (Recommended Plan)

The integrated plan consists of three components:

- Release of grass carp at 12 fish per hydrilla acre
- Continued herbicide management
- Native plantings and habitat modification to encourage native aquatic plants

This plan stocked grass carp based on the 2006 aquatic plant survey. Maintenance stockings will occur no later than every seven years to maintain an adequate population. Annual aquatic surveys will be conducted to estimate the number of grass carp that may need stocked.

Herbicide treatments will continue to treat the 230 high priority acres discussed in the "No Action Alternative." Treatments will be conducted to augment the effects of the grass carp.

Establishing native submersed aquatic plants will be accomplished by managing the spread of hydrilla and transplanting native plants from the nursery. Bare root aquatic plants that are less desirable to the grass carp are planted into coir fiber mats in the nursery. These mats are transplanted in areas that are without hydrilla to establish without competition.

This plan is fluid and may need to be adjusted based on the prevailing conditions.

4.0 TREATMENT ALTERNATIVES FOR WOODRUFF/SEMINOLE SITE

4.1 GENERAL

A complete assessment of alternative treatment methods are found in the "Lake Seminole, FL-GA-AL, Hydrilla Action Plan".

Walter F. George and Woodruff/Seminole have abundant aquatic vegetation that provides fish and wildlife habitat. Woodruff/Seminole contains the greater abundance of native plant species due its geography and relatively shallow depth than Walter F. George. Walter F. George with its greater depth has native vegetation isolated in waters

less than 6 feet. George W. Andrews Lake has few aquatic plants due to the fluctuating flows due to power generation at the Walter F. George Dam. Common native plants at both Walter F. George and Woodruff/Seminole are pondweed, eelgrass, water willow, cattail, water lily, and American lotus.

4.2 UNCONFINED RELEASE OF GRASS CARP ALTERNATIVE

The unconfined release of grass carp into the lake was rejected due to potential adverse impacts within the Apalachicola River and Apalachicola Bay.

4.3 LAKE DRAWDOWN ALTERNATIVE

Controlling hydrilla with a lake drawdown was rejected due to technical uncertainties and significant economic cost. Lake Seminole is a shallow lake and reducing lake levels by at least 10-12 feet will prevent usage of a majority of the lake. Boat docks and boat ramps would be unusable.

4.4 NO ACTION ALTERNATIVE (NO HYDRILLA CONTROL)

This alternative would reduce the short-term cost of the aquatic management program. Migratory waterfowl habitat would likely improve with no hydrilla treatments occurring. By not treating the hydrilla, significant acreage of the lake would potentially be covered. Likely impacts to the “No Action” Alternative are:

- Clogged hydropower intakes
- Impeded water-based recreation
- Increased mosquito populations
- Reduced native aquatic plants
- Low dissolved oxygen
- Loss of spawning habitat

Over 50% of the lake surface has the potential to be covered by hydrilla-dominated submersed vegetation. Deep open water areas and deep channels would remain free of hydrilla.

4.5 TRADITIONAL HERBICIDE ALTERNATIVE

This alternative would be used to manage hydrilla in high-use areas where significant user conflicts occur. EPA-registered herbicides would be applied by certified applicators using airboats with specialized spaying equipment. Approximately 1,600 acres would be treated annually.

4.6 CONFINED GRASS CARP “STAND ALONE” ALTERNATIVE

Confined grass carp would be stocked behind electric barriers constructed on Fish Pond Drain and Cypress Pond. The electric field produced by the barrier would repel grass carp from openings that vessel traffic passes. This alternative does not provide any hydrilla management outside of the 1,400 acre containment areas.

4.7 HERBICIDE DRIP DELIVERY SYSTEM "STAND ALONE" ALTERNATIVE

This alternative would use a metered system to deliver herbicide into the water column of a slow moving waterway. The herbicide would mix with the current and distribute over a large area. The metered delivery maintains a certain concentration in the water which is absorbed by aquatic plants over a 50-70 day period. Systemic herbicides require long contact times to achieve the desired results. Efficiency is dependent on a fairly steady flow that doesn't flush the herbicide out of the target area too rapidly. Approximately 4,000 acres would be treated with this alternative in the Spring Creek arm only.

4.8 MECHANICAL HARVESTING "STAND ALONE" ALTERNATIVE

Mechanical harvesting uses specially designed machines that cut and haul aquatic vegetation. The average harvester has a limited depth of cut and provides only short-term control. Significant fragmentation can occur during operation of the harvester that spreads the plant. The remaining plant material (roots, tubers, and stems) continue to grow. In areas of heavy vegetation, significant time is spent traveling back to boat ramps to off-load biomass which must be disposed of off-site.

Additional harvesters use a vacuum dredge to dislodge rooted plants, the plants are disposed of off-site.

4.9 BIOLOGICAL CONTROL, "STAND ALONE" ALTERNATIVE

This alternative would use host specific insects to control hydrilla. Various biological control options were investigated, however, only the leaf-mining fly *Hydrellia pakistanae* has a reproducing population. *H. pakistanae* was introduced from 1990-1993 into Lake Seminole. Using *H. pakistanae* alone is unlikely to provide adequate control.

4.10 INTEGRATED HYDRILLA MANAGEMENT ALTERNATIVE (RECOMMENDED PLAN)

Confined grass carp, mechanical harvesting, herbicide drip delivery system, hydrilla fly releases, and traditional herbicide applications will be used in combination. Each alternative used will not provide adequate management, however, when used together can provide an acceptable level of control.

Grass Carp will be stocked at 12 fish per acre behind electric barriers in Fish Pond Drain and Cypress Pond. In addition to the grass carp, herbicide treatments may still occur at priority areas where grass carp have not been effective.

The herbicide drip delivery system would be located at the Historic Spring Creek Powerhouse. This location provides a base of operations and narrow area to get adequate dispersal of herbicide.

The exclusive use of mechanical harvesting is not recommended, but could be used for areas that may need quick biomass reductions.

The release of the hydrilla fly, H. pakistanae is the most promising biological control agent outside of grass carp. The hydrilla fly will cause damage to the plant which prevents “topping out” at the surface. It is unlikely that the use of the hydrilla fly will cause enough damage to the hydrilla to supplant other techniques.

5.0 MANAGEMENT STRATEGY

5.1 WALTER F. GEORGE MANAGEMENT PLAN

5.1.1 SUBMERSED

Hydrilla is the primary submersed aquatic plants targeted for treatment. Two primary methods of control will continue to be used to manage the target submersed aquatic vegetation (chemical and biological). The main herbicides used are endothall, diquat dibromide, fluridone, penoxsulam, flumioxazin and copper compounds. In the biological arena there will be continued vigilance on monitoring the past releases of triploid grass carp.

Aquatic surveys conducted in October 2015 showed a significant increase (~1,200) in overall hydrilla acreage. Hydrilla south of the causeway has dramatically increased over 2014. North of the causeway the hydrilla coverage continues to be minimal. This appears to be the results of grazing by the grass carp, and other unknown factors. Major chemical treatments for hydrilla were conducted in 2015 south of the causeway. Herbicide treatments for submersed vegetation will occur on an as needed basis.

5.1.1.1 CHEMICAL

5.1.1.1.1 HYDRILLA

There are two biotypes of hydrilla in the lake: monoecious and dioecious. The monoecious biotype has both male and female

flowers on the same plant. The dioecious biotype has male and female flowers on different plants. Only the female plant is found within the U.S.

5.1.1.1.2 HYGROPHILA

Hygrophila has been discovered on the Eufaula National Wildlife Refuge on both the Alabama and Georgia sides. The total acreage is less than an acre and intensive efforts will be made to eradicate it using flumioxazin.

5.1.2 FLOATING/EMERGENT

5.1.2.1 CHEMICAL

5.1.2.1.1 WATER HYACINTH

The Corps anticipates treating approximately 20 acres of water hyacinths with glyphosate / 2, 4-D / carfentrazone during 2016. Due to flooding in December the acreage and locations likely have changed. Water hyacinth treatments will start in late March/early April and continue until November. Areas of focus will be Cowikee Creek, Chattahoochee River and River Bend area.

5.1.2.1.2 GIANT CUTGRASS

The Corps anticipates treating approximately 100 acres of giant cutgrass using glyphosate and imazapyr in the fall. A large portion of the treatments will be in the Chattahoochee River, north of the main arm of the lake. Areas of focus will be the Chattahoochee River sloughs and River Bend areas. The treatments will consist of treating the outer edges of the cutgrass beds; this will be a continuing program attempting to reduce the surface acreage of giant cutgrass to the shoreline. In an effort to reduce the biomass, prescribed fire may be used where appropriate.

5.1.2.1.3 COMMON REED

Common reed will be spot sprayed with glyphosate on an as needed basis. Small populations are located in sloughs off the Chattahoochee River.

5.1.2.1.4 WATER PRIMROSE

Water primrose, while not currently impairing navigation or recreation is beginning to grow to noticeable levels on the lake margins and around islands. It can out-compete native plants such as water willow which provide beneficial fish habitat.

5.1.2.1.5 COMMON SALVINA

Common salvinia is impairing navigation in Cowikee Creek and in sloughs and creeks off the Chattahoochee River. Common salvinia will be treated on an as needed basis.

5.1.2.1.6 CUBAN BULRUSH

Cuban bulrush has been seen in small patches at the Bagby State Park Marina and washed up on the shoreline of Old Creek Town. Cuban bulrush can reduce fish habitat. Plans are to spot spray as needed.

5.1.2.1.7 GIANT CANE

Giant cane was once planted as erosion control for shorelines, and once established creates monoculture stands crowding out native vegetation. In an effort to reduce the biomass, prescribed fire may be used where appropriate.

5.1.2.2 BIOLOGICAL

There currently are no plans to treat floating or emergent vegetation with biological control agents in 2016. The alligatorweed flea beetle is present in the lake and provides moderate control during the summer and fall.

5.1.3 NATIVE PLANT ESTABLISHMENT

Currently there are eight propagation tanks which are used for growing both submersed and emergent native vegetation. Plants are collected from around the lake or from Lake Seminole. The transplants are checked for hydrilla and planted bare root into coir mats. Each coir mat covers 45 ft^2 for a total of 360 ft^2 of coverage. Once the plants are strong enough for transplanting, they will be planted in water 6 – 24 inches deep. Monitoring of plantings will continue in 2016 along with additional plantings of pondweed, eel grass, spike rush, Sagittaria, bulrush, and southern naiad.

5.2 WOODRUFF/SEMINOLE MANAGEMENT PLAN

5.2.1 SUBMERSED

5.2.1.1 CHEMICAL

5.2.1.1.1 HYDRILLA

Approximately 750 acres are anticipated for treatment.

5.2.1.1.2 LIMNOPHILA

Approximately 300 acres are anticipated for treatment.

5.2.1.1.3 EURASIAN WATERMILFOIL

Approximately 35 acres are anticipated for treatment.

5.2.1.1.4 OTHER

In a constantly changing ecosystem, other plants may become problematic during the year. These plants will be spot treated as time and funds allow.

5.2.1.2 BIOLOGICAL

5.2.1.2.1 HYDRILLA

5.2.1.2.1.1 TRIPLOID GRASS CARP

The triploid grass carp are confined within two areas, known as Fish Pond Drain and Turkey Pond Drain with low voltage electric barriers. Monitoring of the submersed vegetation within the confinement areas will continue. Hydrilla within the Fish Pond Drain and southern end of Turkey Pond Drain area has expanded. *Limnophila sessiliflora* has expanded and herbicide treatments will occur inside the barriers for this plant as grass carp do not eat it. Native vegetation within the Turkey Pond Drain area has not been reduced as significantly as in the Lewis Pond area. The electronics for the low voltage electric barriers are inspected once a year by Smith-Root, Inc. in February. There are budget dependent plans to release triploid grass carp this year in both Fish Pond Drain and Turkey Pond Drain.

5.2.1.2.1.2 HYDRILLA LEAF-MINING FLY

There are plans for new releases of the hydrilla fly within Lake Seminole 2016 in cooperation with the Lewisville Aquatic Research Facility (LAERF). We do expect the existing hydrilla fly population to have some impact on the hydrilla. On-going hydrilla fly research will continued to be monitored if funding is available.

5.2.1.3 MECHANICAL

There are no plans by the Corps to use mechanical harvesters at this time. However, specified acts permits are available to shoreline permit holders and organizations.

5.2.1.4 PHYSICAL

There are no plans to perform any physical removal of submersed aquatic plants. The use of benthic barriers will require a Specified-Acts Permit from the Corps.

5.2.2 FLOATING/EMERGENT

5.2.2.1 CHEMICAL

5.2.2.1.1 WATER HYACINTH

Approximately 75 acres are anticipated for treatment. Treatments will begin in late March with the green up of the vegetation.

5.2.2.1.2 GIANT CUTGRASS

Approximately 400 acres are anticipated for treatment. Giant cutgrass will be sprayed throughout the year in areas where other floating/emergent species occur together. The most effective timing to treat giant cutgrass is late summer and early fall before dormancy.

5.2.2.1.3 CUBAN BULRUSH

Cuban bulrush is growing on the edges of the giant cutgrass, further reducing the shallow water habitat along the shoreline. It is frequently found mixed with water hyacinth. Treatments will begin in early spring.

5.2.2.1.4 COMMON REED

Common Reed has been spreading rapidly the past few years, particularly on the Chattahoochee River Arm of the lake. It forms dense monoculture stands that outcompete native plants. The Corps will spray common reed as they come upon accessible stands during normal operations.

5.2.2.1.5 OTHER

In a constantly changing ecosystem, other plants may become problematic during the year. These plants will be spot treated as time and funds allow.

5.2.2.2 BIOLOGICAL

No biological control measures will be taken this year. Existing biological control may continue to impact alligatorweed and water hyacinth later in the season.

5.2.2.3 MECHANICAL

No mechanical removal is planned by the Corps.

5.2.2.4 PHYSICAL

No physical removal is planned by the Corps for floating/emergent weeds. Prescribed fire may be used by the Corps to reduce biomass on islands. Hand removal and weed trimmers may be used without a permit.

5.3 PERMITTING

Due to the expansion of hydrilla and other invasive aquatic weeds around private docks, the Corps may issue a Specified Acts Permit to obtain the services of a Certified Aquatic Pesticide Applicator to conduct herbicide treatments on Corps managed waters. Applications for the Specified Acts Permit may be found on the Walter F. George Site or Woodruff/Seminole Site websites.
WALTER F. GEORGE SITE
WOODRUFF/SEMINOLE SITE

APPENDIX A

AQUATIC PLANTS OF CONCERN TO THE ACF RIVERS PROJECT

SCIENTIFIC NAME	**COMMON NAME**
Alternanthera philoxeroides	Alligatorweed
Arundo donax	Giant cane
Cabomba caroliniana	Fanwort
Egeria densa	Brazilian elodea
Elodea Canadensis	Elodea
Eichhornia crassipes	Water hyacinth
Hydrilla verticillata	Hydrilla
Hygrophila polysperma	East Indian hygrophila
Limnophila sessiliflora	Asian marshweed
Myriophyllum aquaticum	Parrotsfeather
Myriophyllum spicatum	Eurasian watermilfoil
Najas minor	Slender naiad
Nelumbo lutea	American lotus
Oxycaryum cubense	Cuban bulrush
Panicum repens	Torpedo grass
Phragmites spp.	Common reed
Potamogeton spp.	Pondweed
Salvinia minima	Water fern
Zizaniopsis miliacea	Giant cutgrass

US Army Corps
of Engineers
Mobile District

APPENDIX B

SAMPLE AQUATIC PERMIT APPLICATION

US Army Corps of Engineers
Mobile District

APPLICATION FOR AN AQUATIC PEST CONTROL TREATMENT PERMIT ON U.S. ARMY CORPS OF ENGINEERS LANDS AND WATERS

File #: _____ Shoreline Permit #: _____

This is an application to obtain an Individual Aquatic Herbicide Treatment Permit. The U.S. Army Corps of Engineers prohibits the use of herbicides on or in its reservoirs except in strict compliance with an individual aquatic pesticide permit signed and issued by the Corps. This application must be fully completed and signed by both the property owner requesting authorization ("Property Owner") and the state-certified aquatic pesticide commercial applicator proposing to perform the aquatic herbicide services ("Licensed Applicator") in Part IV. INCOMPLETE APPLICATIONS WILL BE DENIED.

Part I. Property Owner Information

A. Property Owner Information

Name: _____

Primary Mailing Address: _____

_____

Primary Phone: _____ Email: _____

Primary Lake Phone: _____ Alt. Phone: _____

B. Exact Location of Intended Herbicide Treatment

Address: _____

_____

Reservoir: _____ River/ Creek: _____

Subdivision: _____ County: _____

Shoreline Permit #: _____

Additional Location Information: _____

C. Explanation of Aquatic Herbicide Treatment Need

Explain reasons for requesting aquatic herbicide treatment permit:

----------End of Page----------

US Army Corps of Engineers
Mobile District

Part II. Licensed Applicator Information

A. Licensed Applicator Information (See Part III, Paragraph 2 Requirements)

Licensed Applicator Name: _____

Company Name: _____

Address: _____

Email: _____ Website: _____

Office Phone: _____ Mobile Phone: _____

Phone where you can be reached at the time of treatment: _____

State Applicator License #: _____

Certification Expiration Date: _____

Additional State Certifications (as applicable[1]).

Certifying State: _____ Applicator ID#: _____

Certification Expiration Date: _____

B. Nuisance Aquatic Weed and Treatment Information

Aquatic Nuisance Weed Species to Be Treated: _____

Herbicides & Adjuvants: _____

Quantity to Be Used: _____

GPS Coordinates of Treatment Area: _____

Square Footage of Treatment Area: _____

Application Equipment to Be Used: _____

_____

_____

_____

Preferred Dates for Herbicide Application: _____

C. Confirmation of Aquatic Herbicide Treatment Need

_____

_____

D. Applications must include the following:

1. A vicinity map showing the location of the proposed site.
2. An accurate drawing/depiction of the herbicide application treatment site, showing the extent of shoreline impacted, property lines, and an outline of the treatment area.
3. Recent photographs of the proposed treatment area and the nuisance aquatic vegetation targeted.

----------End of Page----------

Part III. Permit Conditions and Restrictions

1. Licensed Applicator must perform all pesticide treatments in accordance with all federal, state, and local laws, rules, regulations, and guidance.

2. Herbicides shall only be applied by **State-Certified and Licensed Aquatic Pesticide Applicators** for the state in which the application takes place.

3. Applicators will utilize application equipment that is capable of metering the pesticide as it is applied to ensure proper application rate in accordance with pesticide label instructions.

4. Licensed Applicator must use, store, and manage all herbicides in strict conformance with all federal and state product labels (e.g., labels approved by the U.S. EPA under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)).

5. Licensed Applicator must post water use restrictions (and otherwise warn/notify potentially impacted persons) in accordance with the herbicide label and best professional judgment. Licensed Applicator must also provide additional warning/notice as appropriate to ensure the protection of public and environmental health and safety and to prevent any and all property damage. Licensed Applicators must also ensure any and all persons or entities operating water withdrawals in the vicinity are provided notice prior to the herbicide treatment. Licensed Applicator is advised that lawns and vegetable gardens may be irrigated from the reservoir and must take into account any and all such irrigation before performing the herbicide treatments.

6. Applicators and Property Owners must ensure that herbicide treatment is performed to ensure the protection of public and environmental health and safety and to prevent any and all property damage, including, without limitation, the health of non-target vegetation, wildlife, fish, and pets.

7. Herbicide and pesticide applications must be in strict compliance with the Pesticide General Permit (PGP) from the state from where the application takes place.

8. Applicators shall use only herbicides categorized as "general use" by the U.S. EPA.

9. Applicators must, as soon as safely possible, notify the Corps in the event that an unauthorized application (or discharge) has occurred or a dangerous situation has arisen with respect to the herbicide treatment.

10. Applicators shall send an herbicide application report to the ACF Rivers Project Management Office at the address below prior to December 15th of the calendar year.

11. Prior to any applications notify the ACF Rivers Aquatic Plant Manager to prevent duplicate treatments by applicators/Corps.

US Army Corps
of Engineers
Mobile District

Part IV. Property Owner and Licensed Applicator Certification and Signature

The undersigned Property Owner and Licensed Applicator each, separately and independently, acknowledge and agree as follows.

1. Property Owner and Licensed Applicator hereby release and agree to save and hold the Corps harmless from any and all liability, causes of action, suits at law or equity, or claims or demands of any nature whatsoever, for or on account of any injuries or damages to persons or property related to the herbicide treatments; provided, however, neither indemnifies the Corps for Corps' own sole negligence.

2. Property Owner and Licensed Applicator assume full responsibility for any damage claims arising from their actions or omissions under this permit and, among other things, are obligated to replace or restore any non-target vegetation, wildlife, or fish killed or injured as a result of the herbicide treatments.

3. Property Owner represents and warrants that they: (a) have read and fully understands the Permit Conditions and Restrictions above; (b) have taken all prudent steps and actions to ensure the Licensed Applicator is fully informed about public and private use of the reservoir in the vicinity of the herbicide treatments, as well as any special circumstances; and (c) have personally verified that the Licensed Applicator is currently certified in accordance with Part III, Paragraph 2.

4. Licensed Applicator represents and warrants that they: (a) have read and fully understands the Permit Conditions and Restrictions above; (b) have the technical and professional expertise to accomplish the herbicide treatments in a safe manner, ensuring public and environmental health and safety and the absence of property damage; (c) have the appropriate certification as stated in Part III, Paragraph 2; and (d) will accomplish the herbicide treatments in accordance with the Permit Conditions and Restrictions above.

5. The Corps may impose additional conditions and restrictions on the activities proposed under this permit.

6. Property Owner and Licensed Applicator certify that the information provided in this application is true, complete, and accurate.

_____	_____
Property Owner Signature	Licensed Applicator Signature
_____	_____
Date	Date

US Army Corps of Engineers
Mobile District

If you have any questions about this application, please contact the ACF Office, using the contact information below.

ACF Office

ACF Rivers Project Management Office
621 Beams Drive
Eufaula, AL 36027
334-232-4543
Attention: Brent Mortimer

U.S. ARMY CORPS OF ENGINEERS AUTHORIZATION

THE USE OF PESTICIDES AND HERBICIDES ON ANY CORPS RESERVOIR IS PROHIBITED, EXCEPT IN STRICT COMPLIANCE WITH THE TERMS AND CONDITIONS OF THIS INDIVIDUAL AQUATIC PESTICIDE PERMIT, AND ONLY IF SIGNED AND ISSUED BY CORPS BELOW.

THE U.S. ARMY CORPS OF ENGINEERS HEREBY ALLOWS THE USE OF THE HERBICIDE IDENTIFIED ABOVE, BY THE LICENSED APPLICATOR IDENTIFIED ABOVE, AT THE LOCATIONS IDENTIFIED ABOVE. THIS AUTHORIZATION IS VALID FROM THE DATE LISTED BELOW, AND UNTIL DECEMBER 1ST OF THE CALENDAR YEAR.

Aquatic Plant Manager	Natural Resource Manager
Authorization Date	Authorization Date