

2009

SOUTH CAROLINA AQUATIC PLANT  
MANAGEMENT PLAN  
PART 2



Prepared by the  
Aquatic Nuisance Species Program  
South Carolina Department of Natural Resources  
and Approved by the  
South Carolina Aquatic Plant Management Council  
2009

## **2009 SOUTH CAROLINA AQUATIC PLANT MANAGEMENT COUNCIL**

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## PART II - 2009 ANNUAL MANAGEMENT PLAN

### INTRODUCTION

The Annual Management Plan for 2009 was developed by application of the procedures described in the Aquatic Plant Management Plan, Part I (Procedural Management Plan). The phases of development of the Annual Management Plan include 1) identification of areas where aquatic plants interfere with water use, 2) development of a description of each problem area, 3) development of a management strategy for each problem area, and 4) determination of the distribution of available funding among problem areas.

#### Common and Scientific Names of Aquatic Plants Referenced in the Plan

Alligatorweed	<i>Alternanthera philoxeroides</i>
Bladderwort	<i>Utricularia spp.</i>
Brazilian elodea	<i>Egeria densa</i>
Bur Marigold	<i>Bidens spp.</i>
Cowlily	<i>Nuphar luteum macrophyllum</i>
Cattails	<i>Typha spp.</i>
Coontail	<i>Ceratophyllum demersum</i>
Creeping rush	<i>Juncus repens</i>
Curly-leaf pondweed	<i>Potamogeton crispus</i>
Duckweed	<i>Lemna spp.</i>
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
Fanwort	<i>Cabomba caroliniana</i>
Filamentous algae	<i>Pithophora, Lyngbya, Hydrodictyon</i>
Floating bladderwort	<i>Utricularia inflata</i>
Floating heart	<i>Nymphoides spp.</i>
Frog's bit	<i>Limnobium spongia</i>
Giant cutgrass	<i>Zizaniopsis miliacea</i>

Hydrilla	<i>Hydrilla verticillata</i>
Lotus	<i>Nelumbo lutea</i>
Musk-grass	<i>Chara</i>
Pondweed	<i>Potamogeton spp.</i>
Common reed	<i>Phragmites australis</i>
Slender naiad	<i>Najas minor</i>
Smartweed	<i>Polygonum densiflorum</i>
Southern naiad	<i>Najas guadalupensis</i>
Spikerush	<i>Eleocharis spp.</i>
Stonewort	<i>Nitella</i>
Variable-leaf pondweed	<i>Potamogeton diversifolius</i>
Waterlily	<i>Nymphaea odorata</i>
Water hyacinth	<i>Eichhornia crassipes</i>
Water lettuce	<i>Pistia stratiotes</i>
Watermilfoil	<i>Myriophyllum spp.</i>
Water pennywort	<i>Hydrocotyle ranunculoides</i>
Water primrose	<i>Ludwigia hexapetala</i>
Watershield	<i>Brasenia schreberi</i>

## Aquatic Plant Problem Areas

Areas where aquatic plants interfere with water use were identified from information provided by S.C. Aquatic Plant Management Council members, an aquatic plant survey conducted by the S.C. Department of Natural Resources staff and public input. The identified problem areas listed below are open to access and use by the public and are therefore considered by the Council as eligible for some type of public funding. Acres of infestation (coverage) are approximations based on observations made in 2008

**SPECIAL NOTE: Due to 2009 budget problems and in an effort to continue to serve all of the areas around the state; each water body will only be eligible for up to \$40,000 of cost share money from the SCDNR.**

- 1) Water body - Back River Reservoir
  - Location - Berkeley County
  - Surface acres - 850
  - Aquatic plants - Hydrilla, Water hyacinth, Water primrose, Fanwort
  - Coverage - 300 acres
  - Impaired activities- Boating, fishing, hunting, swimming, industrial water supply, municipal water supply, electric power generation, public access
- 2) Water body - Baruch Institute
  - Location - Georgetown County
  - Surface acres - Unknown, adjacent to Winyah Bay
  - Aquatic plants - Phragmites
  - Coverage - 50+ acres
  - Impaired activities - Boating, hunting, fishing, public access
- 3) Water body - Black Mingo Creek
  - Location - Georgetown County
  - Surface acres -Unknown
  - Aquatic plants - Alligatorweed, Parrot feather
  - Coverage - 5 acres
  - Impaired activities - Boating, hunting, fishing, public access
- 4) Water body - Black River
  - Location - Georgetown County
  - Surface acres -Unknown
  - Aquatic plants - Alligatorweed
  - Coverage – 10 acres
  - Impaired activities - Boating, hunting, fishing, public access
- 5) Water body - Bonneau Ferry
  - Location - Berkeley County
  - Surface acres -Unknown - Multiple Reserves and impoundments

- Aquatic plants - Water hyacinth, Water primrose, Frog's bit, Lotus, Cat-tails, Cutgrass, Pennywort, Parrotfeather, Fanwort, Coontail  
 Coverage - 50 acres  
 Impaired activities - Boating, hunting, fishing, public access
- 6) Water body – Boyd Pond  
 Location - Aiken County  
 Surface acres -21 acres  
 Aquatic plants – Bladderwort, watermilfoil, water primrose  
 Coverage - 20 acres  
 Impaired activities - Boating, hunting, fishing, public access
- 7) Water body - Combahee River (Borrow pit)  
 Location - Colleton County  
 Surface acres - approx. 5 acres  
 Aquatic plants - Hydrilla, Water primrose, Water hyacinth  
 Coverage - 4 acres  
 Impaired activities - Boating, hunting, fishing, public access
- 8) Water body - Cooper River (and adjacent ricefields)  
 Location - Berkeley County  
 Surface acres - Unknown  
 Aquatic plants - Hydrilla, Water primrose, Water hyacinth  
 Coverage - approx. 3,000 acres  
 Impaired activities - Boating, hunting, fishing, public access
- 9) Water body - Donnelley/Bear Island WMA  
 Location - Colleton County  
 Surface acres - Multiple impoundments and rivers  
 Aquatic plants - Cutgrass, Frog's bit, Cattails, Phragmites  
 Coverage - 40 acres  
 Impaired activities - Hunting, public access
- 10) Water body - Dungannon Plantation Heritage Preserve  
 Location - Charleston County  
 Surface acres - Unknown  
 Aquatic plants - Cutgrass, Frog's bit, Cattails, Water primrose, Swamp loosestrife  
 Coverage - 15 acres  
 Impaired activities - Wood stork nesting site, public access
- 11) Water body - Goose Creek Reservoir  
 Location - Berkeley County  
 Surface acres - 600  
 Aquatic plants - Water hyacinth, Water lettuce, Water primrose, Hydrilla, Salvinia(Salvinia minima)  
 Coverage - 150 acres  
 Impaired activities - Boating, public access, industrial water supply, floodway

- 12) Water body – Lake Cunningham
  - Location - Greenville County
  - Surface acres -160 acres
  - Aquatic plants – Brazilian elodea, Water primrose, Waterlily spatterdock
  - Coverage – 45 acres
  - Impaired activities - Boating, hunting, fishing, public access
- 13) Water body - Lake Darpo
  - Location - Darlington County
  - Surface acres – 17.5 acres
  - Aquatic plants - Water lily, milfoil
  - Coverage - 15 acres
  - Impaired activities - Boating, swimming, fishing, vector control, public access
- 14) Water body - Lake Greenwood
  - Location -Laurens and Greenwood Counties
  - Surface acres - 11,400
  - Aquatic plants - Hydrilla, Slender naiad
  - Coverage - 220 acres
  - Impaired activities – Potential impacts to electric power generation, boating, swimming, vector control, public access
- 15) Water body - Lake Keowee
  - Location – Pickens and Oconee Counties
  - Surface acres – 18,300 acres
  - Aquatic plants - Hydrilla
  - Coverage - 10 acres
  - Impaired activities - Potential impacts to electric power generation, municipal water supply, boating, swimming, vector control, public access
- 16) Water body - Lake Murray
  - Location - Lexington and Richland Counties
  - Surface acres - 50,000
  - Aquatic plants - Hydrilla, Illinois pondweed, Water primrose, Alligatorweed
  - Coverage - 100 acres
  - Impaired activities - Boating, swimming, domestic and municipal water intakes, public access
- 17) Water body - Lake Wateree
  - Location – Kershaw County
  - Surface acres – 13,710 acres
  - Aquatic plants – Hydrilla, cutgrass
  - Coverage - 5 acres
- 18) Impaired activities - Potential impacts to boating, swimming, vector control, public access
  - Water body - Little Pee Dee River
  - Location - Marion and Horry Counties
  - Surface acres - Unknown
  - Aquatic plants - Alligatorweed

- Coverage - 50 acres
- Impaired activities - Boating, hunting, fishing, public access
- 19) Water body - Lumber River
  - Location - Marion and Horry Counties
  - Surface acres - Unknown
  - Aquatic plants - Alligatorweed
  - Coverage - 10 acres
  - Impaired activities - Boating, hunting, fishing, public access
- 20) Water body - Pee Dee River
  - Location - Georgetown County
  - Surface acres - Unknown
  - Aquatic plants - Water hyacinth, Phragmites
  - Coverage - 50 acres
  - Impaired activities - Boating, hunting
- 21) Water body - Samworth WMA
  - Location - Georgetown County
  - Surface acres - Unknown
  - Aquatic plants - Phragmites, Water hyacinth
  - Coverage - 100 acres
  - Impaired activities - Hunting, public access
- 22) Water body - Santee Coastal Reserve
  - Location - Georgetown County
  - Surface acres - Unknown
  - Aquatic plants - Phragmites
  - Coverage - 300 acres
  - Impaired activities - Hunting, public access
- 23) Water body - Santee Delta WMA
  - Location - Georgetown County
  - Surface acres - Unknown
  - Aquatic plants - Phragmites
  - Coverage - 25+ acres
  - Impaired activities - Hunting, public access
- 24) Water body - US Army Corps of Engineers - Charleston Harbor/Intracoastal Waterway
  - Location - Charleston County
  - Surface acres - Unknown
  - Aquatic plants - Phragmites
  - Coverage - 200+ acres
  - Impaired activities - Boating, hunting, fishing, public access
- 25) Water body - US Naval Weapons Station
  - Location - Charleston and Berkeley Counties
  - Surface acres - Unknown
  - Aquatic plants - Frog's-bit, Water primrose, Water hyacinth, Phragmites

Coverage - 75 acres

Impaired activities - Boating, hunting, fishing, public access

26) Water body - Waccamaw River

Location - Georgetown and Horry Counties

Surface acres - Unknown

Aquatic plants - Water hyacinth, Phragmites

Coverage - 50 acres

Impaired activities - Boating, hunting, fishing, public access

27) Water body - Yawkey Wildlife Center

Location - Georgetown County

Surface acres - Unknown

Aquatic plants - Phragmites

Coverage - 25+ acres

Impaired activities - Hunting, public access

### **Santee Cooper Lakes**

28) Water body - Lake Marion

Location - Sumter, Clarendon, Calhoun, Berkeley, and Orangeburg Counties.

Surface acres - 110,000

Aquatic plants - Alligatorweed, Brazilian elodea, Hydrilla, Water primrose, Slender naiad, Coontail, Water hyacinth, Filamentous algae, Fanwort, Cutgrass, Crested floating Heart

Coverage - 1000 acres

Impaired activities - Boating, swimming, public access, potential electric power generation, potential irrigation water withdrawals

29) Water body - Lake Moultrie

Location - Berkeley County

Surface acres - 60,400

Aquatic plants - Alligatorweed, Water primrose, Brazilian elodea, Hydrilla, Slender naiad, Water hyacinth, Watermilfoil, Fanwort, Cutgrass

Coverage - 150 acres

Impaired activities - Potential electric power generation, boating, swimming, public access, potential domestic and irrigation water withdrawals

### **SC Parks, Recreation and Tourism - State Park Lakes**

30) Water body - Barnwell State Park

Location - Barnwell County

Surface acres - 12

Aquatic plants - Waterlily

Coverage - 3 acres

Impaired activities - Fishing, swimming, aesthetics

- 31) Water body - Charles Towne Landing State Park  
 Location - Charleston County  
 Surface acres - 5  
 Aquatic plants - Duckweed, Alligatorweed, Pennywort, Cyanobacteria  
 Coverage - 4 acres  
 Impaired activities - Fishing, tourism, aesthetics
- 32) Water body - H. Cooper Black Recreation Area  
 Location - Chesterfield County  
 Surface acres - 2 acres  
 Aquatic plants - Spatterdock  
 Coverage - 1 acres  
 Impaired activities - Recreational activities
- 33) Water body - Huntington Beach SP  
 Location - Horry County  
 Surface acres - 15 acres  
 Aquatic plants - Cutgrass, Phragmites, Cattails  
 Coverage - 5 acres  
 Impaired activities - Recreational activities
- 34) Water body - Kings Mountain State Park - Crawford Lake  
 Location - York County  
 Surface acres - 9  
 Aquatic plants - Slender naiad  
 Coverage - 4 acres  
 Impaired activities - Swimming, boating
- 35) Water body - Little Pee Dee State Park  
 Location - Dillon County  
 Surface acres - 75  
 Aquatic plants - Spikerush, Cowlily  
 Coverage - 15 acres  
 Impaired activities - Fishing, boating
- 36) Water body - N.R. Goodale State Park  
 Location - Kershaw County  
 Surface acres - 160 acres  
 Aquatic plants - Waterlily, Watershield  
 Coverage - 60 acres  
 Impaired activities - Swimming, recreational activities
- 37) Water body - Poinsett State Park  
 Location - Sumter County  
 Surface acres - 10 acres  
 Aquatic plants - Spatterdock, Watershield  
 Coverage - 5 acres  
 Impaired activities - Swimming, fishing

- 38) Water body - Sesquicentennial State Park  
Location - Richland County  
Surface acres - 25 acres  
Aquatic plants - Waterlily, Watershield  
Coverage - 10 acres  
Impaired activities - Swimming, fishing

**SC Department of Natural Resources - State Lakes**

- 39) Water body - Lake Cherokee  
Location - Cherokee County  
Surface acres - 50 acres  
Aquatic plants - Water primrose  
Coverage - 5 acres  
Impaired activities - Boating, fishing
- 40) Water body - Lake Edwin Johnson  
Location - Spartanburg County  
Surface acres - 40 acres  
Aquatic plants - Water primrose, Hydrilla, Pondweed  
Coverage - 10 acres  
Impaired activities - Boating, fishing
- 41) Water body - Jonesville Reservoir  
Location - Union County  
Surface acres - 25 acres  
Aquatic plants - Water primrose, Pondweed  
Coverage - 10 acres  
Impaired activities - Boating, fishing
- 42) Water body - Mountain Lakes  
Location - Chester County  
Surface acres - 70 acres  
Aquatic plants - Water primrose, Alligatorweed, Parrotfeather  
Coverage - 5 acres  
Impaired activities - Boating, fishing
- 43) Water body - Lancaster Reservoir  
Location - Lancaster County  
Surface acres - 61 acres  
Aquatic plants - Water primrose, Alligatorweed  
Coverage - 8 acres  
Impaired activities - Boating, fishing, hunting
- 44) Water body - Sunrise Lake  
Location - Lancaster County  
Surface acres - 25 acres

- Aquatic plants - Pondweed
- Coverage - 15 acres
- Impaired activities - Boating, fishing
- 45) Water body - Lake Ashwood
  - Location - Lee County
  - Surface acres - 75 acres
  - Aquatic plants - Waterlily
  - Coverage - spotty
  - Impaired activities - Boating, fishing
- 46) Water body - Lake Edgar Brown
  - Location - Barnwell County
  - Surface acres - 100 acres
  - Aquatic plants - Water primrose, Coontail
  - Coverage - 60 acres
  - Impaired activities - Boating, fishing
- 47) Water body - Lake George Warren
  - Location - Hampton County
  - Surface acres - 400 acres
  - Aquatic plants - Cattails, Water primrose, Coontail
  - Coverage - 20 acres
  - Impaired activities - Boating, fishing
- 48) Water body - Lake Thicketty
  - Location - Cherokee County
  - Surface acres - 100 acres
  - Aquatic plants - Hydrilla
  - Coverage - 5 acres
  - Impaired activities - Boating, fishing

### **South Carolina Border Lakes**

- 49) Water body - Lake Wylie
  - Location – York County, SC; Gaston and Mecklenburg County, NC
  - Surface acres – 13,443 acres
  - Aquatic plants - Hydrilla
  - Coverage - 90 acres(all in NC waters)
  - Impaired activities - Potential impacts include electric power generation, boating, swimming, public access, domestic and irrigation water withdrawals

## AQUATIC PLANT MANAGEMENT STRATEGY

The following management strategies were developed for each identified problem area considered eligible for public funding. Planned expenditures are based on known available federal funds, estimated state funds and anticipated local support as of the date of this plan. For water bodies in which final funding is inadequate to conduct all proposed control operations, the extent of control will be reduced and priority areas and target plants will be determined by the Department of Natural Resources in cooperation with the local sponsor. A summary of proposed expenditures for 2009 and a location map of problem water bodies are located at the end of this section.

SPECIAL NOTE: Due to 2009 budget problems (in an effort to serve all of the areas around the state) each water body will only be eligible for up to \$40,000 of cost share money from the SCDNR.

### Public Waters

#### Back River Reservoir (Berkeley County)

##### Problem plant species

Hydrilla, Water hyacinth, Fanwort, Water primrose, Cutgrass

##### Management objectives

Reduce water hyacinth and water primrose populations throughout the lake to enhance public access, navigation, water flow and minimize impacts to water intakes from floating islands.

Reduce hydrilla in upper Foster Creek area to improve water quality, water flow and navigation.

Reduce hydrilla and fanwort in 60 acre area adjacent to SCE&G Williams Station intake to enhance water flow, minimize clogging of water intake, and enhance public boating and fishing use in this area.

Reduce hydrilla and fanwort at Bushy Park Landing to enhance public boating and fishing use in this area.

##### Selected control method

Problem Species	Control Agent
Water hyacinth	Renovate 3, Reward, Clearcast, Galleon SC

Water primrose, Cutgrass                      Renovate 3, Reward, Habitat, Clearcast, Glyphosate  
Hydrilla    Chelated copper\*, Chelated copper\*/Reward, Galleon SC

May be toxic to fish at recommended treatment rates; however, precautions will be implemented to minimize the risk of fish kills.

### **Area to which control is to be applied**

Renovate 3, Reward, Clearcast, and Galleon SC - 300 acres of water hyacinth throughout the lake.

Habitat, Clearcast, Glyphosate - 50 acres of water primrose and cutgrass throughout the lake.

Chelated copper\*/Reward, Galleon SC - 150 acres of hydrilla; 2 treatments of 60 acre area near SCE&G intake, 5 acres of hydrilla adjacent to Bushy Park Landing, 25 acres of hydrilla in Foster Creek arm (2 treatments-15 acres each ).

### **Rate of control agents to be applied**

Renovate 3 - 0.5 to 0.75 gallons per acre

Reward - 0.5 gallon per acre.

Clearcast - 1 to 4 pints per acre.

Glyphosate - up to 6 pints per acre.

Chelated copper - up to 1 ppm (about 16 gallons per acre).

Chelated copper\*/Reward - 4 gallons/2 gallons per acre

Habitat - 4 pints per acre/up to 6 pints per acre.

Galleon SC - Submersed 0.174 fl oz/acre foot to achieve minimum effective concentration of 25 to 75 ppb, Floating species – 2 to 6 fl oz/acre as foliar application.

### **Method of application of control agents**

Renovate 3, Reward, Habitat, Clearcast, Glyphosate - spray on surface of foliage with appropriate surfactant.

Chelated copper, Chelated copper\*/Reward - subsurface injection from airboat.

### **Timing and sequence of control application**

Three hundred (300) acres of water hyacinths treated with Renovate 3, Clearcast, Galleon SC (May-September), Reward (October). The initial treatments are to be followed in 1-2 days with a cleanup treatment.

Fifty (50) acres of water primrose and cutgrass treated with Habitat, Clearcast, and Glyphosate during the growing season (May-October).

15 acres of hydrilla in Foster Creek to be treated 2 times (April-October) with Galleon SC.

Hydrilla and fanwort located adjacent to public boat ramp to be treated with chelated copper, Galleon SC.

Hydrilla located near the SCE&G water intake to be treated periodically during the year with Chelated copper, Chelated copper\*/Reward (up to three times in the same 60 acre area), treatment area may be expanded as control is realized in target are

**Other control application specifications**

Herbicide used only upon approval by the S.C. Department of Health and Environmental Control.

All herbicide treatments conducted within 1600 feet of the CPW water intake will use Renovate 3 at a rate of 0.5 gallons per acre or less or Galleon SC at a rate of 2 to 6 oz/acre. Reward treatments will be conducted at least 1600 feet from the intake. Following any application of Reward within 1600 feet of the CPW water intake, herbicide residue concentrations may be monitored according to a plan agreed to by the S.C. Department of Natural Resources, Charleston Commissioners of Public Works(CPW), and the Department of Health and Environmental Control.

If filamentous algae are present on submersed macrophytes, an algaecide, such as K-TEA, will be used in addition to selected herbicides to assist in control.

Control is to be applied in a manner that will not significantly degrade water quality in the treatment area. This may involve treating only a portion of the area at any one time.

**Entity to apply control agents**

Commercial applicator

**Estimated cost of control operations**

\$67,571

**Potential sources of funding**

Water primrose and water hyacinths -

Charleston Commissioners of Public Works 30%

S.C. Electric and Gas Co. 20%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

Hydrilla and Cabomba (near SCE&G intake) -

S.C. Electric and Gas Co. 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

Hydrilla (Foster Creek, boat ramp, and Back River) -

Charleston Commissioners of Public Works 30%

S.C. Electric and Gas Co. 20%

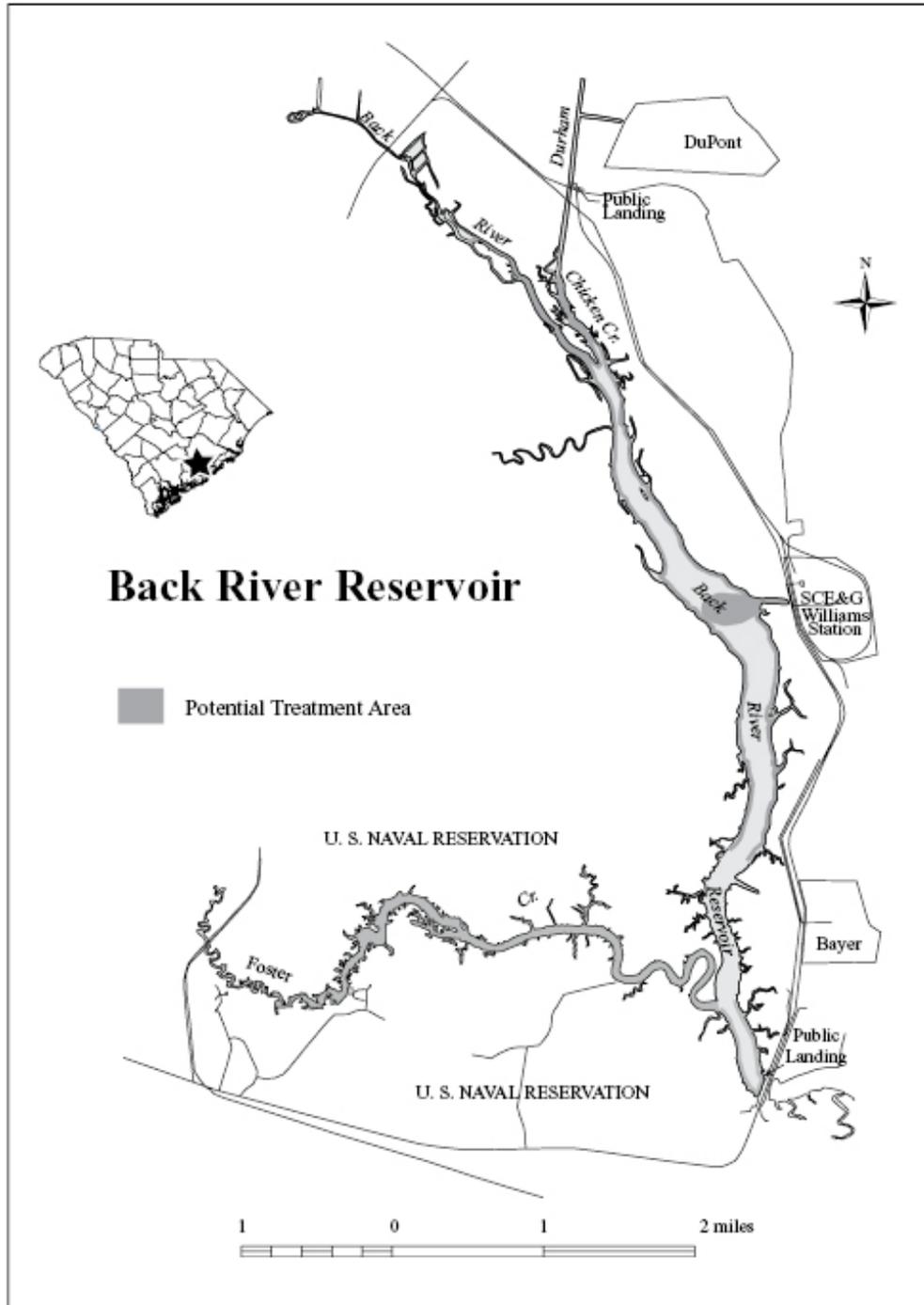
U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d) Effective long term control of water hyacinth in the reservoir must also include control of this species in the Cooper River to which the reservoir is connected.



**Baruch Institute  
(Georgetown County)**

**Problem plant species**

Phragmites

**Management objective**

Through a comprehensive, multi-year approach; reduce Phragmites populations to the greatest extent possible

**Selected control method**

Problem Species	Control Agent
Phragmites	Habitat

**Area to which control is to be applied**

75 acres of phragmites throughout area

**Rate of control agent to be applied**

Habitat - 2 to 6 pints per acre.

Clearcast - 2 to 6 pints per acre.

**Method of application of control agent**

Helicopter - 75 acres of Habitat, Clearcast applied to phragmites.

Other applications - Spray on surface of foliage with appropriate surfactant.

**Timing and sequence of control application**

Apply when plants are actively growing (July - Oct.).

**Other control application specifications**

None

**Entity to apply control agent**

Commercial applicator

**Estimated cost of control operations**

\$10,794

**Potential sources of funding**

Baruch Institute 50%

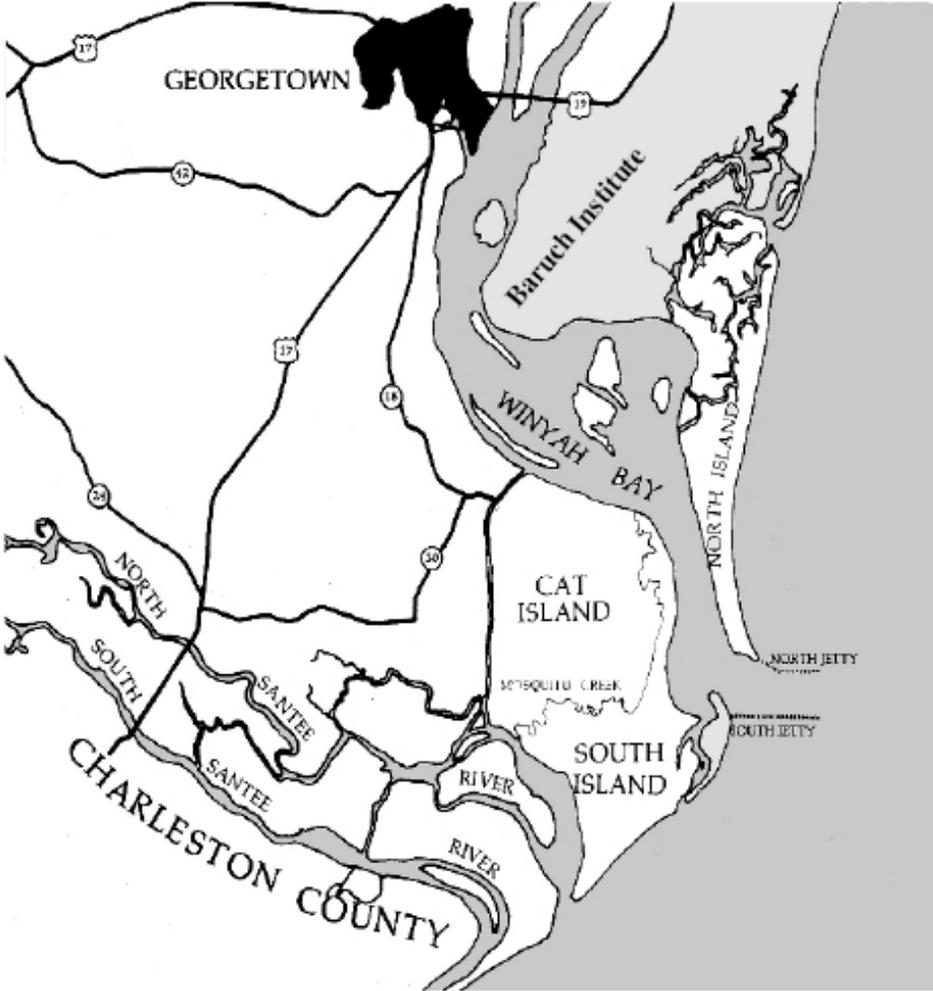
U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)  
(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d) Continue to coordinate treatment areas with local conservation groups.

# Baruch Institute



## **Black Mingo Creek (Georgetown County)**

### **Problem plant species**

Alligatorweed, Parrot feather, Frog's bit, Pennywort

### **Management objective**

Reduce or remove nuisance weed infestation at public access points, the main river channel, and connecting lakes to improve water quality and navigation.

### **Selected control method**

Problem Species	Control Agent
Alligatorweed, Pennywort	Renovate 3, Habitat, Clearcast, Glyphosate
Frog's bit, Parrot feather	Reward, Galleon SC

### **Area to which control is to be applied**

20 acres of problematic plants throughout river

### **Rate of control agent to be applied**

- Reward - 0.5 gallon per acre.
- Renovate 3 - 0.5 to 0.75 gallons per acre.
- Habitat - 2 to 3 pints per acre.
- Clearcast - 1 to 4 pints per acre.
- Glyphosate - up to 6 pints per acre.

### **Method of application of control agent**

Spray on surface of foliage with appropriate surfactant.

### **Timing and sequence of control application**

Apply when plants are actively growing (May - Oct.).

### **Other control application specifications**

None

### **Entity to apply control agent**

Commercial applicator

### **Estimated cost of control operations**

\$1,819

### **Potential sources of funding**

Georgetown County 50%

U.S. Army Corps of Engineers 0%

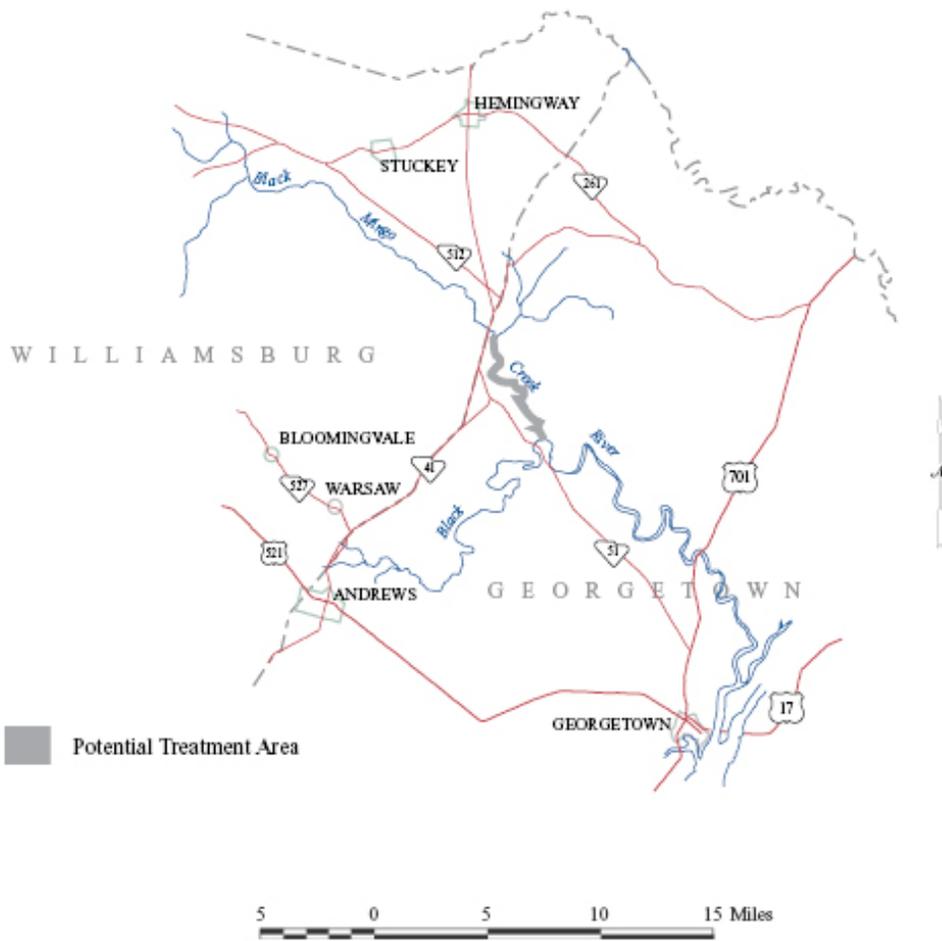
S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d) Continue to coordinate treatment areas with local conservation groups.

# Black Mingo Creek



## **Black River (Georgetown County)**

### **Problem plant species**

Alligatorweed, Parrot feather, Frog's bit, Pennywort, Phragmites

### **Management objective**

Reduce or remove nuisance weed infestation at public access points, the main river channel, and connecting lakes to improve water quality and navigation.

### **Selected control method**

Problem Species	Control Agent
Alligatorweed, Pennywort	Renovate 3, Habitat, Clearcast, Glyphosate
Frog's bit, Parrot feather	Reward, Galleon SC
Phragmites	Habitat, Clearcast

### **Area to which control is to be applied**

20 acres of problematic plants throughout river

### **Rate of control agent to be applied**

Reward - 0.5 gallon per acre.

Renovate 3 - 0.5 to 0.75 gallons per acre.

Habitat - 2 to 3 pints per acre.

Clearcast - 1 to 4 pints per acre.

Glyphosate - up to 6 pints per acre.

Galleon SC - Floating species – 2 to 6 fl oz/acre as foliar application.

### **Method of application of control agent**

Spray on surface of foliage with appropriate surfactant.

### **Timing and sequence of control application**

Apply when plants are actively growing (May - Oct.).

### **Other control application specifications**

None

### **Entity to apply control agent**

Commercial applicator

**Estimated cost of control operations**

\$1,819

**Potential sources of funding**

Georgetown County 50%

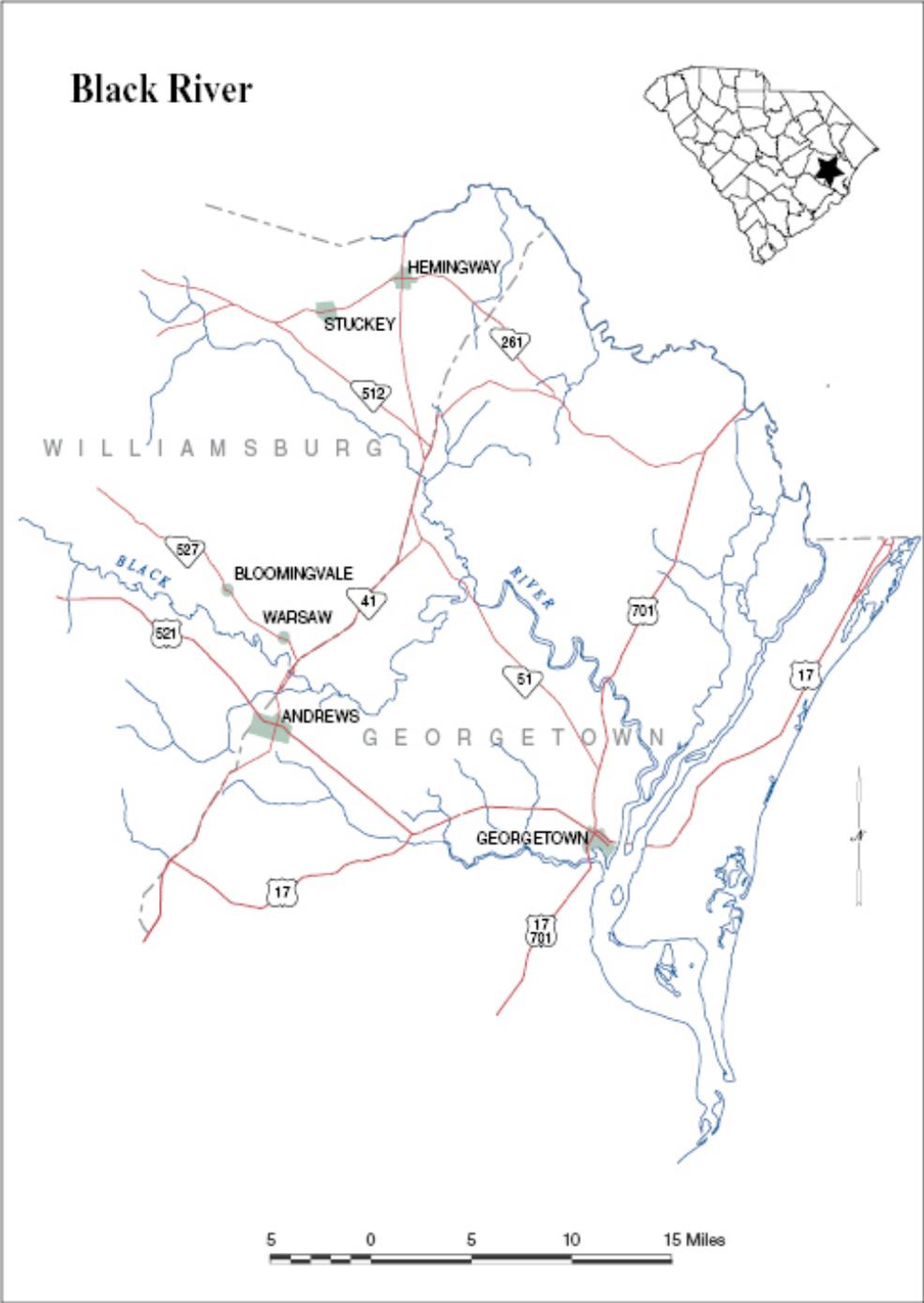
U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d) Continue to coordinate treatment areas with local conservation groups and State Scenic Rivers Coordinator.



## Bonneau Ferry (Berkeley County)

### Problem plant species

Water Primrose, Water hyacinth, Cattails, Lotus, Cutgrass, Pennywort, Frog's bit, Parrotfeather

### Management objective

Reduce nuisance plant populations to the greatest extent possible throughout Bonneau Ferry impoundments to enhance water quality, water flow, waterfowl habitat, fishing, and hunting opportunities.

### Selected control method

Problem Species	Control Agent
Water primrose, Pennywort	Renovate 3, Habitat, Clearcast, Glyphosate
Cattails, Cutgrass, Parrotfeather	Habitat, Clearcast, Glyphosate
Water hyacinth, Frog's bit	Renovate 3, Reward, Clearcast, and Galleon SC

### Area to which control is to be applied

50 acres of problematic plants throughout the reserves and impoundments of Bonneau Ferry.

### Rate of control agent to be applied

- Reward - 0.5 gallon per acre.
- Renovate 3 - 0.5 to 0.75 gallons per acre.
- Habitat - 2 to 3 pints per acre.
- Clearcast - 1 to 4 pints per acre.
- Glyphosate - up to 6 pints per acre.
- Galleon SC - Floating species – 2 to 6 fl oz/acre as foliar application.

### Method of application of control agent

- Helicopter - 20 acres of Habitat, Clearcast with appropriate surfactant.
- Other applications - Spray on surface of foliage with appropriate surfactant from boat.

### Timing and sequence of control application

Apply when plants are actively growing.

### Other control application specifications

None

**Entity to apply control agent**

Commercial applicator

**Estimated cost of control operations**

\$7,808

**Potential sources of funding**

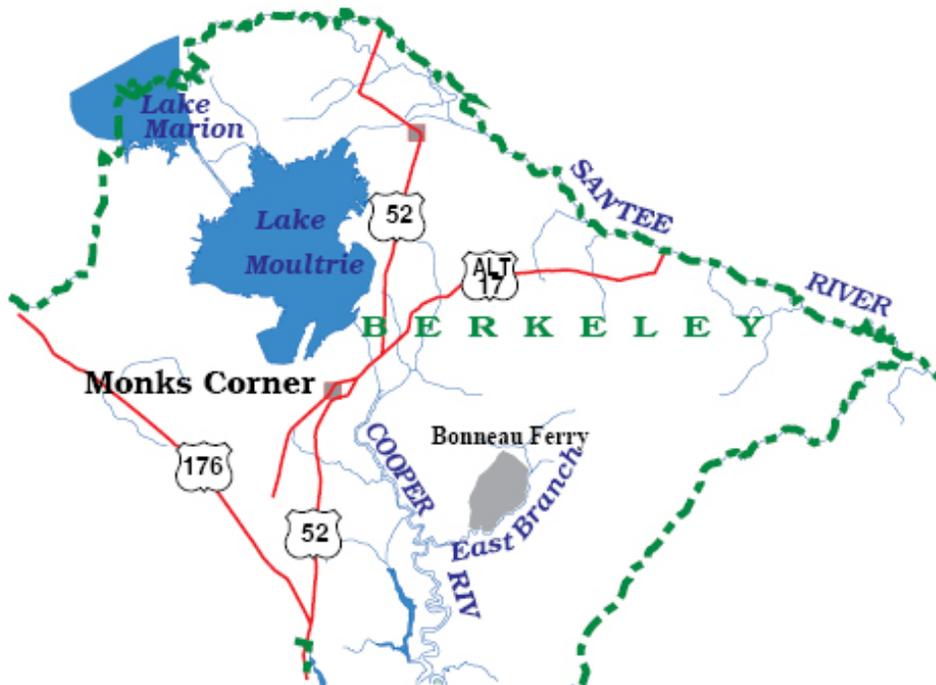
S.C. Department of Natural Resources 100%

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

# Bonneau Ferry



## Boyd Pond (Aiken County)

### Problem plant species

Water milfoil, Bladderwort, Water primrose, Emergent grasses

### Management objective

Reduce nuisance plant populations to the greatest extent possible throughout lake to enhance water quality, water flow, waterfowl habitat, fishing, and hunting opportunities.

### Selected control method

<u>Problem Species</u>	<u>Control Agent</u>
Water milfoil, Bladderwort	Hardball, Stingray
Water primrose,	Renovate 3, Habitat, Clearcast
Emergent grasses	Renovate 3, Habitat, Clearcast,

### Area to which control is to be applied

21 acres of problematic plants throughout Boyd Pond.

### Rate of control agent to be applied

Renovate 3 - 0.5 to 0.75 gallons per acre.  
Habitat - 2 to 3 pints per acre.  
Clearcast - 1 to 4 pints per acre. -  
Hardball - up to 5 gallons per acre  
Stingray - up to 2 ounces per acre

### Method of application of control agent

Herbicides spray on surface of foliage with appropriate surfactant from boat or subsurface injection from airboat.

### Timing and sequence of control application

Herbicide - Apply when plants are actively growing.

### Other control application specifications

All herbicide applications are to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time. The submersed treatments will be divided into 2 or 3 different applications to avoid a Dissolved Oxygen problem.

Milfoil may require multiple treatments.

### Entity to apply control agent

Commercial applicator

**Estimated cost of control operations**

\$5,465

**Potential sources of funding**

Aiken County 50%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d) Periodically revise the management strategy and specific control sites as new environmental data, management agents and techniques, and public use patterns become available.



# Boyd Pond



## Combahee River (Borrow pit) (Colleton County)

### Problem plant species

Alligatorweed, Parrot feather, Frog's bit

### Management objective

Reduce or remove alligatorweed infestation at public access points, the main river channel, and connecting lakes.

### Selected control method

Problem Species	Control Agent
Alligatorweed	Renovate 3, Habitat, Clearcast, Glyphosate
Frog's bit, Parrot feather	Reward, Galleon SC

### Area to which control is to be applied

5 acres of problematic plants to be treated 2 times during the growing season.

### Rate of control agent to be applied

Reward - 0.5 gallon per acre.

Renovate 3 - 0.5 to 0.75 gallons per acre.

Habitat - 2 to 3 pints per acre.

Clearcast - 1 to 4 pints per acre.

Glyphosate - up to 6 pints per acre.

Galleon SC - Floating species – 2 to 6 fl oz/acre as foliar application.

### Method of application of control agent

Spray on surface of foliage with appropriate surfactant.

### Timing and sequence of control application

Apply when plants are actively growing (May - Oct.).

### Other control application specifications

None

### Entity to apply control agent

Commercial applicator

### Estimated cost of control operations

\$622.00

**Potential sources of funding**

Colleton County 50%

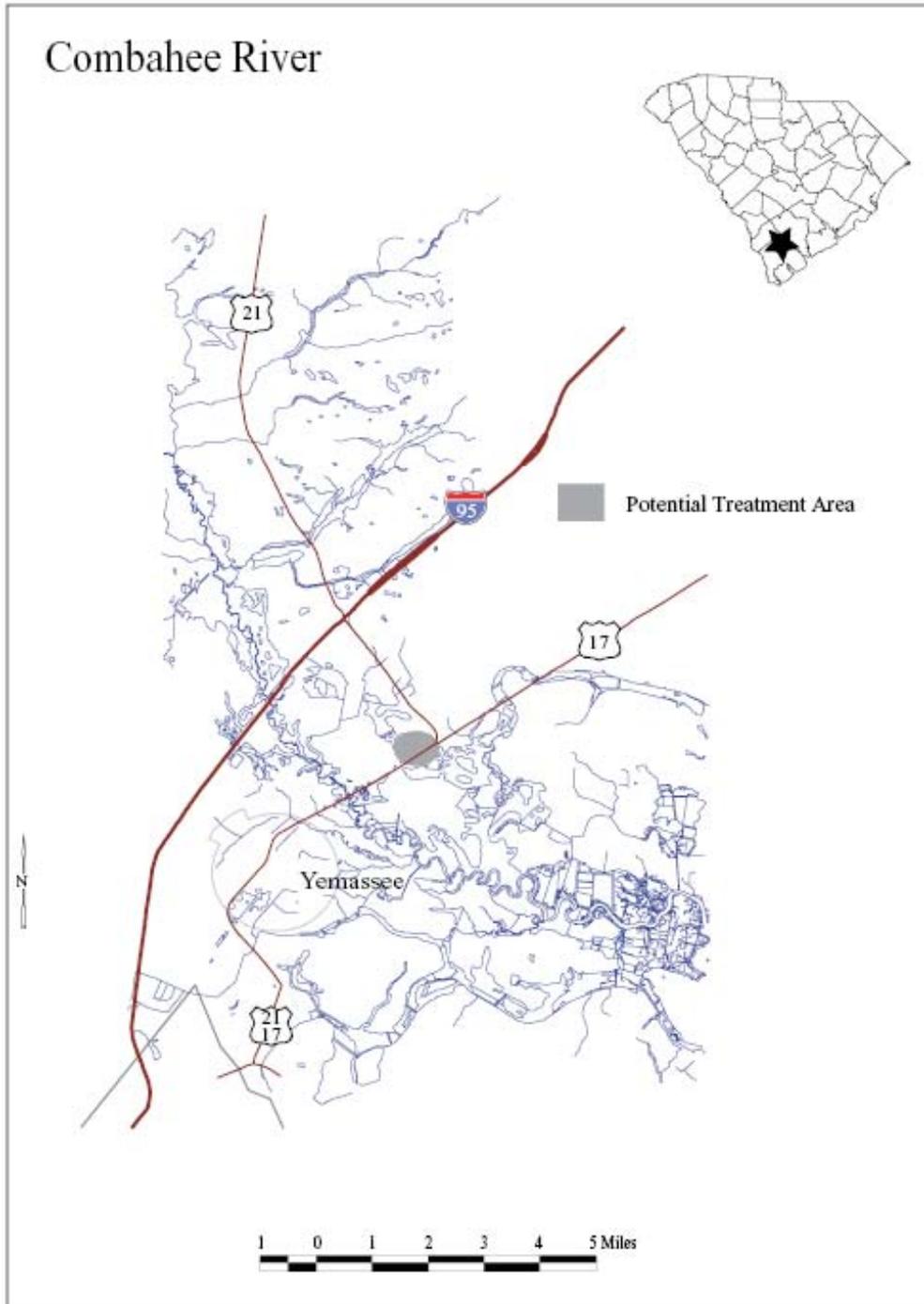
U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)  
(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d) Continue to coordinate treatment areas with local conservation groups.

# Combahee River



## Cooper River (Berkeley County)

### Problem plant species

Hydrilla, Water hyacinth, Water primrose

### Management objectives

Reduce water hyacinth populations to the greatest extent possible in the Main River and public ricefields.

Reduce water primrose growth along boat channels to maintain navigation.

Open limited boat trails in hydrilla infested ricefields to enhance public access to the river and selected ricefields.

### Selected control method

Problem Species	Control Agent
Water hyacinth	Renovate 3, Reward, Clearcast, Glyphosate, Galleon SC
Water primrose	Renovate 3, Reward, Habitat, Clearcast, Glyphosate
Hydrilla	Chelated copper*

\* May be toxic to fish at recommended treatment rates; however, precautions will be implemented to minimize the risk of fish kills.

### Area to which control is to be applied

Renovate 3, Reward, Habitat, Clearcast, Glyphosate, Galleon SC - 300 acres of water hyacinth and water primrose throughout river system and in narrow boat channels in French Quarter Creek, Rice Hope Plantation ricefield, and Berkeley Yacht Club ricefield.

Chelated copper - 48 acres (16 acres treated 3 times yearly, spring and fall) to open boat trails in Pamlico, Berkeley Yacht Club and Rice Hope Plantation ricefields and French Quarter Creek canal.

### Rate of control agents to be applied

Habitat - 2 to 4 pints per acre.

Reward - 2 quarts per acre.

Renovate 3 - up to 4 quarts per acre

Clearcast - 1 to 4 pints per acre.

Glyphosate - up to 6 pints per acre.

Chelated copper - up to 1 ppm (about 16 gallons per acre).

Galleon SC - Floating species – 2 to 6 fl oz/acre as foliar application.

**Method of application of control agent**

Renovate 3, Reward, Habitat, Galleon SC - spray on surface of foliage with appropriate surfactant.

Chelated copper - subsurface injection from airboat.

**Timing and sequence of control application**

All agents to be applied when plants are actively growing. Chelated copper treatment of boat trails to be conducted as close to low tide as possible to minimize water movement.

**Other control application specifications**

None

**Entity to apply control agent**

Commercial applicator

**Estimated cost of control operations**

\$47,766

**Potential sources of funding**

Berkeley County 50%

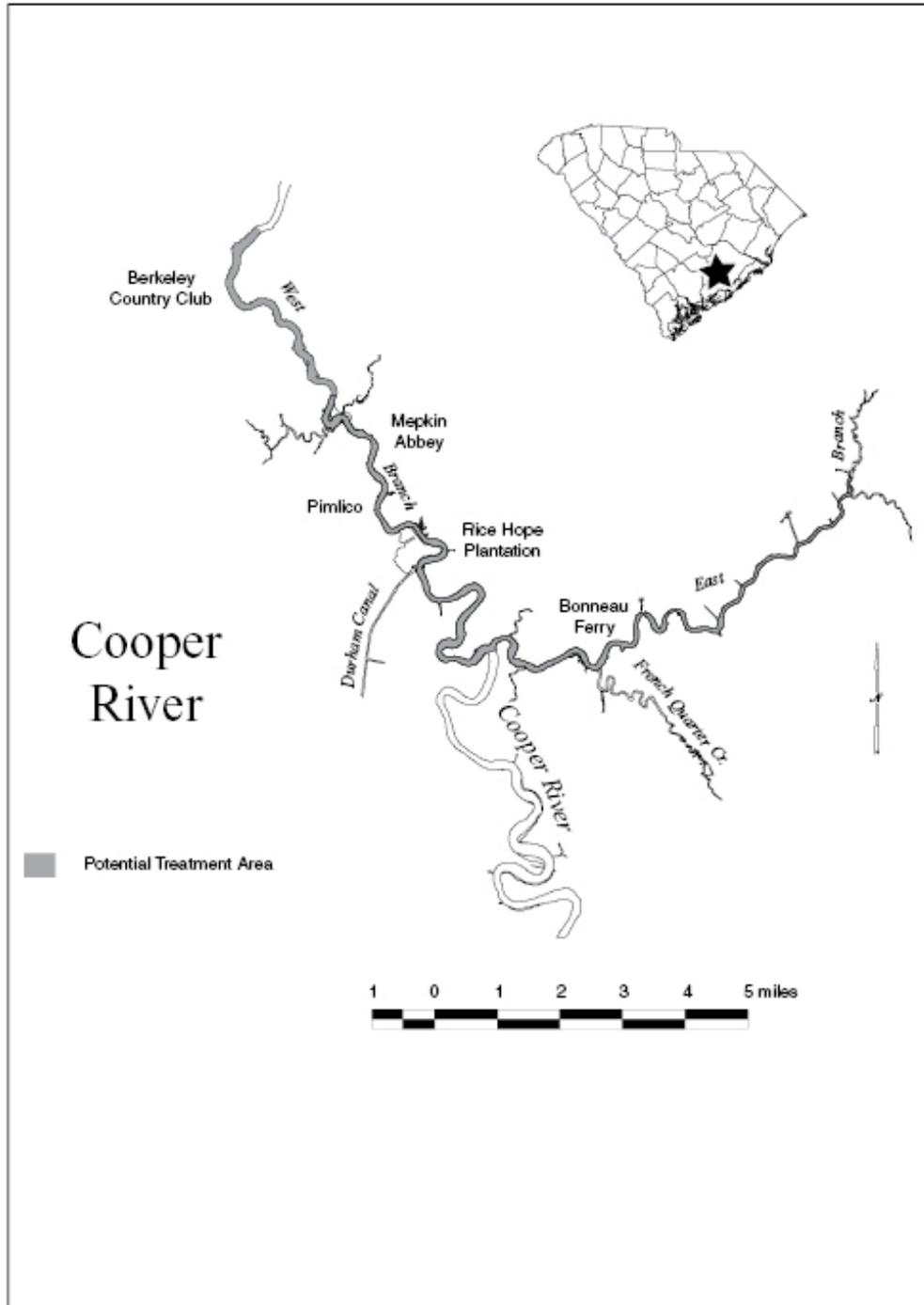
U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d) Long term management must include consideration of water hyacinth control in many privately owned ricefields to which the public does not have boat access. Water hyacinth from these ricefields can reinfest public areas.



## **Donnelley WMA/Bear Island WMA/ACE Basin (Colleton County)**

### **Problem plant species**

Frog's bit, Cattails, Cutgrass, Phragmites, Swamp loosestrife

### **Management objective**

Reduce problem plant populations to enhance waterfowl habitat, public access and use.

### **Selected control method**

Problem Species	Control Agent
Frog's bit	Renovate 3, Galleon SC
Phragmites, Cattails	Habitat, Clearcast, Glyphosate
Cutgrass, Swamp loosestrife	Habitat, Clearcast, Glyphosate

### **Area to which control is to be applied**

45 acres of Frog's bit, Phragmites, Cattails, Cutgrass, and Swamp loosestrife throughout the area.

### **Rate of control agent to be applied**

Renovate 3 - 0.5 to 0.75 gallons per acre

Habitat - 2 to 3 pints per acre.

Clearcast - 1 to 4 pints per acre.

Glyphosate - up to 6 pints per acre.

Galleon SC - Floating species – 2 to 6 fl oz/acre as foliar application.

### **Method of application of control agent**

Spray on surface of foliage with appropriate surfactant.

### **Timing and sequence of control application**

Apply when plants are actively growing (May - Oct.).

### **Other control application specifications**

Application to be conducted by airboat and helicopter.

### **Entity to apply control agent**

Commercial applicator

### **Estimated cost of control operations**

\$6,236

**Potential sources of funding**

Donnelley WMA/USF&W 50%

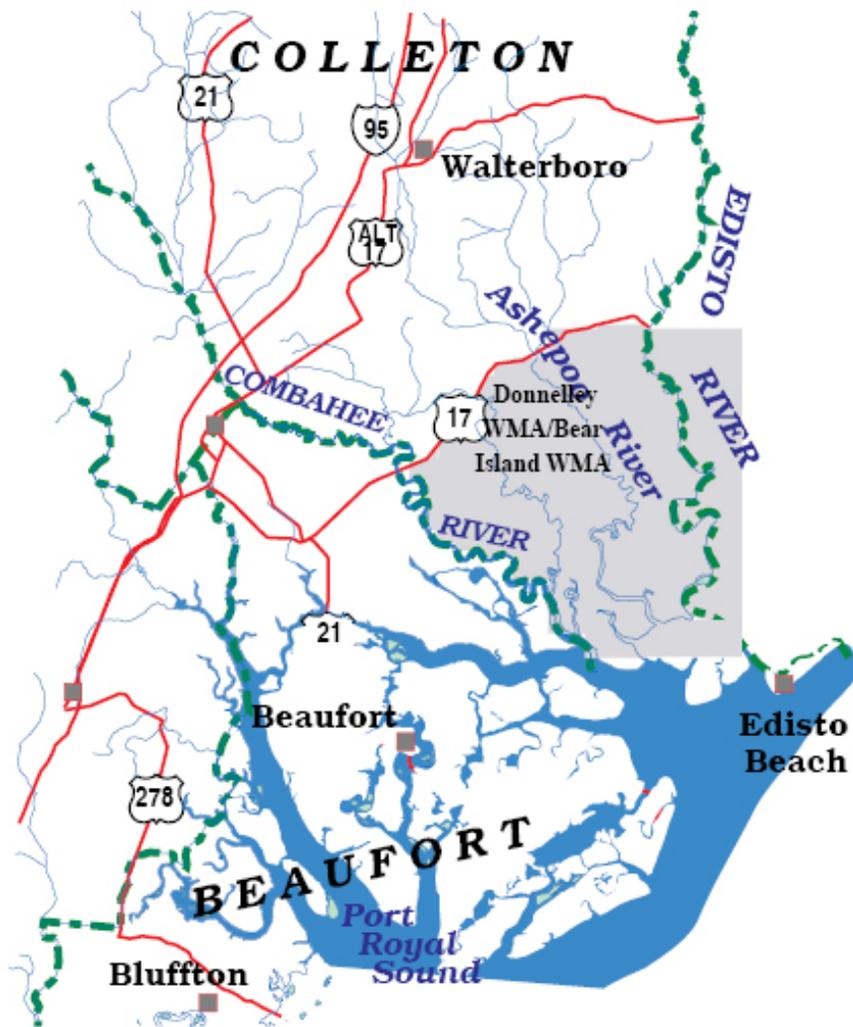
S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

## Donnelley/Bear Island



## Dungannon Plantation Heritage Preserve (Charleston County)

### Problem plant species

Frog's bit, Cattails, Bur Marigold, Cutgrass, Water Primrose, Swamp loosestrife

### Management objective

Reduce problem plant populations to enhance Wood stork nesting habitat, public access and use.

### Selected control method

Problem Species	Control Agent
Frog's bit, Water primrose, Bur marigold	Renovate 3, Habitat, Clearcast, Glyphosate
Cattails	Habitat, Clearcast, Glyphosate
Cutgrass, Swamp loosestrife	Habitat, Clearcast, Glyphosate

### Area to which control is to be applied

12 acres of Frog's bit, Water primroses, and Bur marigold

12 acres of Cattails, Cutgrass, and Swamp loosestrife throughout the area.

### Rate of control agent to be applied

Renovate 3 - 0.5 to 0.75 gallons per acre

Habitat - 2 to 3 pints per acre.

Clearcast - 1 to 4 pints per acre.

Glyphosate - up to 6 pints per acre.

### Method of application of control agent

Spray on surface of foliage with appropriate surfactant.

### Timing and sequence of control application

Apply when plants are actively growing (May - Oct.).

### Other control application specifications

Application to be conducted by airboat and Jon-boat.

### Entity to apply control agent

Commercial applicator

### Estimated cost of control operations

\$2,537

**Potential sources of funding**

Donnelley WMA/USF&W 50%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Enhance aquatic plant communities to benefit waterfowl and to increase nesting activities of Wood storks and other waterfowl.

# Dungannon Plantation HP



## Goose Creek Reservoir (Berkeley County)

### Problem plant species

Water hyacinth, Water primrose, Water lettuce, Hydrilla, Watermilfoil, Fanwort, Salvinia (minima), Duckweed

### Management objective

Reduce water hyacinth and water lettuce populations to the greatest extent possible throughout the lake.

Reduce water primrose, water lettuce and water hyacinth in the upper portion of the lake to enhance water flow and public access.

Reduce hydrilla growth throughout the lake to minimize its spread within the lake, help prevent its spread to adjacent public waters, and minimize adverse impacts to public use and access.

Reduce duckweed growth throughout populated portions of the lake to minimize adverse impacts to public use and access.

Reduce filamentous algae growth throughout populated portions of the lake to minimize adverse impacts to public use and access.

Maintain diverse aquatic plant community through selective application of control methods.

### Selected control method

Problem Species	Control Agent
Water primrose	Renovate 3, Habitat, Clearcast, Glyphosate
Water hyacinth, Water lettuce	Renovate 3, Reward, GalleonSC
Watermilfoil, fanwort	Reward, Hardball, Stingray
Hydrilla	Aquathol K, chelated copper, triploid grass carp
Duckweed	Sonar, Reward, GalleonSC
Filamentous Algae	Nautique

### Area to which control is to be applied

Renovate 3, Habitat, Clearcast, Glyphosate- 100 acres water primrose in upper lake and boat ramp.

Reward - 50 acres of water hyacinth and water lettuce throughout lake.

Renovate 3, Reward, Galleon SC - 100 acres of water hyacinth and water lettuce throughout lake.

Reward, Hardball, Stingray - 20 acres of submersed growth throughout the reservoir.

Release triploid grass carp in areas of the lake with greatest hydrilla growth. Grass carp will be released in selected areas, such as boat ramps and park sites, around the lake to achieve as even a distribution as practicable.

Sonar, Reward, GalleonSC – 50 acres of duckweed near populated areas of the lake

Nautique – 50 acres of filamentous algae near populated areas of the lake

### **Rate of control agents to be applied**

Reward - 0.5 gallon per acre.

Renovate 3 - 0.50 to 0.75 gallons per acre.

Habitat - up to 4 pints per acre.

Clearcast - 1 to 4 pints per acre.

Glyphosate - up to 6 pints per acre.

Hardball - up to 5 gallons per acre.

Stingray - up to 12 ounces per acre.

Galleon SC - Submersed 0.174 fl oz/acre foot to achieve minimum effective concentration of 25 to 75 ppb Floating species – 2 to 6 fl oz/acre as foliar application.

\*Triploid Grass Carp - 2,250 fish in the entire reservoir

\*Based on surveys showing 150 acres of hydrilla infestation and allowing for 15 fish per vegetated acre. This is to compensate for severe increase in reinfestation of hydrilla in the past several years.

### **Method of application of control agents**

Renovate 3, Habitat, Glyphosate, Reward, Galleon SC - spray on surface of foliage with appropriate surfactant.

Reward, Hardball, Stingray, Galleon SC - subsurface injection from airboat.

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

### **Timing and sequence of control application**

All agents to be applied when plants are actively growing.

Triploid grass carp to be released as soon as possible in the spring of 2009 (March-May).

RESULTS FROM GRASS CARP MAY NOT BE EVIDENT FOR TWO OR MORE YEARS.

### **Other control application specifications**

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time. Coordinate all control operations with Charleston Commissioners of Public Works and Goose Creek Reservoir Watershed Task Force.

If available, all sterile grass carp will be a minimum of 12 inches in length. Sterile grass carp shipments for Goose Creek Reservoir will be certified by the SCDNR for sterility and checked for size and condition prior to stocking in the lake.

Hydrilla is slowly increasing in acreage along with other submerged species. Hydrilla populations will be carefully monitored and in the event that significant regrowth occurs during the year the Aquatic Plant Management Council may consider the need for additional grass carp or treat with herbicides to give short-term control as needed.

#### **Entity to apply control agents**

Herbicides - Commercial Applicator

Triploid Grass Carp - S.C. Public Service Authority and/or a commercial supplier with supervision by the SCDNR.

#### **Estimated cost of control operations**

\$43,019

#### **Potential sources of funding**

Charleston Commissioner of Public Works 50%

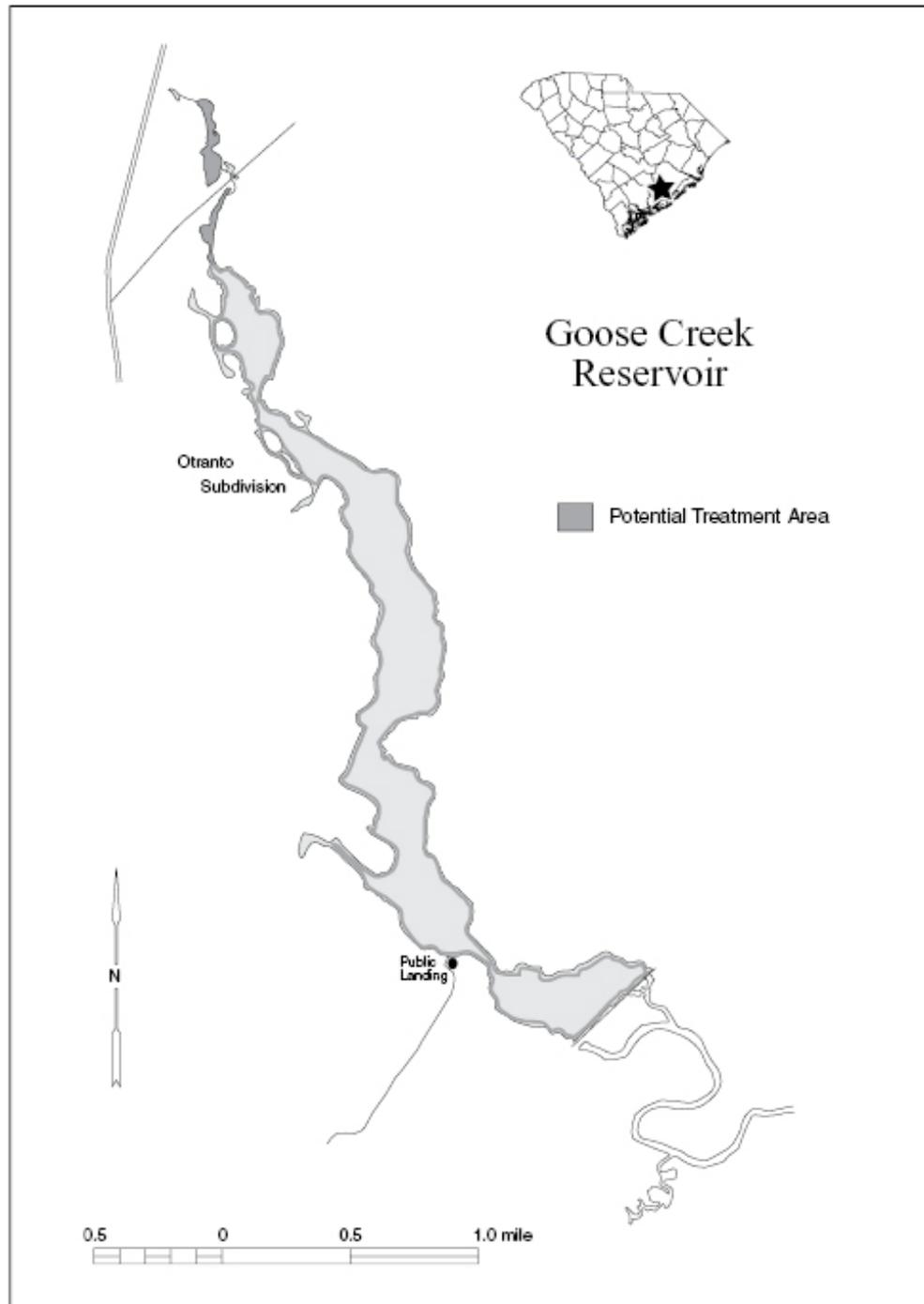
U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

#### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species



## Lake Cunningham (Greenville County)

### Problem plant species

Brazilian elodea, Fragrant water-lily, Water primrose, Spatterdock

### Management objective

Reduce nuisance plant populations to the greatest extent possible throughout lake to enhance water quality, water flow, waterfowl habitat, fishing, and hunting opportunities.

### Selected control method

<u>Problem Species</u>	<u>Control Agent</u>
Brazilian elodea	Chelated copper, triploid grass carp
Water primrose,	Renovate 3, Habitat, Clearcast,
Fragrant waterlily, spatterdock	Renovate 3, Habitat, Clearcast,

### Area to which control is to be applied

40 acres of problematic plants throughout Lake Cunningham.

### Rate of control agent to be applied

Renovate 3 - 0.5 to 0.75 gallons per acre.

Habitat - 2 to 3 pints per acre.

Clearcast - 1 to 4 pints per acre. –

Chelated copper – up to 1 ppm.

Triploid grass carp – 675 total fish (15 fish per vegetated acre)

### Method of application of control agent

Herbicides spray on surface of foliage with appropriate surfactant from boat or subsurface injection from airboat

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest Brazilian elodea growth.

### Timing and sequence of control application

Herbicide - Apply when plants are actively growing.

Triploid grass carp to be released as soon as possible in the spring of 2009 (March-May).

RESULTS FROM GRASS CARP MAY NOT BE EVIDENT FOR TWO OR MORE YEARS.

Other control application specifications

If available, all sterile grass carp will be a minimum of 12 inches in length. Sterile grass carp shipments for Lake Cunningham will be certified by the SCDNR for sterility and checked for

size and condition prior to stocking in the lake and additional incremental stockings may be necessary based on the possibility of escape via the outflow at the dam

**Entity to apply control agent**

Commercial applicator

**Estimated cost of control operations**

\$7,612

**Potential sources of funding**

Greer CPW 50%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) A long-term integrated management strategy has been implemented to control Brazilian elodea. Triploid grass carp have been stocked to control Brazilian elodea growth lake-wide and approved aquatic herbicides are used to control localized growth in priority use areas. Future plans include annual maintenance stocking of grass carp to maintain the population at a level that is sufficient to maintain control of Brazilian elodea but to minimize impacts on desirable native plant populations.
- d) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- e) Periodically revise the management strategy and specific control sites as new environmental data, management agents and techniques, and public use patterns become available.

# Lake Cunningham



## Lake Darpo (Darlington County)

### **Problem plant species**

Water lily, Milfoil

### **Management objectives**

Reduce problem plant populations to enhance waterfowl habitat, public access and use.

### **Selected control method**

Problem Species	Control Agent
Water lily, milfoil	Hardball, Stingray

### **Area to which control is to be applied**

Hardball, Stingray - 10 acres of Milfoil infestation.

### **Rate of control agents to be applied**

Hardball - up to 5 gallons per acre  
Stingray - up to 2 ounces per acre

### **Method of application of control agents**

Hardball, Stingray - subsurface injection from airboat. Application by airboat with adjuvant two (2) times per year.

### **Timing and sequence of control application**

Agent to be applied when plants are actively growing.

### **Other control application specifications**

Treatment of control area is to be conducted in a manner that will not significantly degrade water quality.

Milfoil may require multiple treatments.

### **Entity to apply control system**

Commercial applicator

### **Estimated cost of control operations**

\$2,339

### **Potential sources of funding**

Darlington County 50%

U.S. Army Corps of Engineers 0%

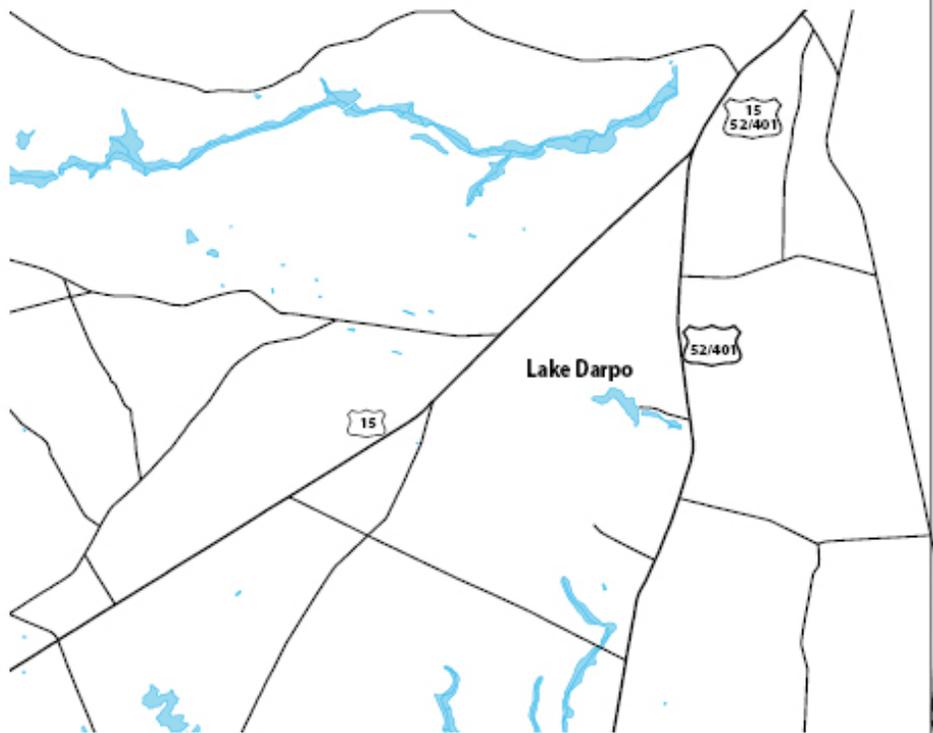
S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

# Lake Darpo



## Lake Greenwood (Greenwood and Laurens County)

### Problem plant species

Slender naiad, Hydrilla

### Management objectives

Reduce slender naiad in developed shoreline areas and areas of high public access and use.

Eliminate hydrilla from Rabon Creek arm and around Greenwood State Park.

### Selected control method

Problem Species	Control Agent
Slender naiad, Hydrilla	Aquathol K, Sonar, chelated copper*

### Area to which control is to be applied

Aquathol K - 40 acres of slender naiad infestation.

Aquathol K, Sonar, chelated copper\* - 60 acres of hydrilla infestation in upper Rabon Creek arm, 60 acres around Greenwood State Park, and 100 acres in the Reedy River Arm.

### Rate of control agents to be applied

Aquathol K - 0.5 to 4 ppm (about 3 to 8 gallons per acre depending on depth)

Sonar - 0.075 to 0.25 ppm

Chelated Copper- up to 1 ppm

Sonar Q, Sonar PR - up to .40 ppm (approx 10 pounds/acre)

Triploid Grass Carp – 3,300 total fish (15 fish per vegetated acre for 220 acres of hydrilla)

### Method of application of control agents

Aquathol K, Sonar, chelated copper\* - Subsurface application by airboat with adjuvant.

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

### Timing and sequence of control application

Agent to be applied to slender naiad when plants are actively growing.

Agent to be applied to hydrilla when plants are actively growing but prior to tuber production.

Triploid grass carp to be released as soon as possible in the spring of 2009 (March-May).

RESULTS FROM GRASS CARP MAY NOT BE EVIDENT FOR TWO OR MORE YEARS.

### **Other control application specifications**

Herbicide used only upon approval by the S.C. Department of Health and Environmental Control.

Treatment of control area is to be conducted in a manner that will not significantly degrade water quality. Survey and final determination of treatment areas to be conducted in conjunction with the South Carolina Department of Natural Resources district fisheries biologist. In general, treatment will be limited to developed shoreline areas, public access sites, and areas of high public use.

Hydrilla may require multiple treatments.

### **Entity to apply control system**

Commercial applicator

### **Estimated cost of control operations**

\$80,720

### **Potential sources of funding**

Greenwood County 50%

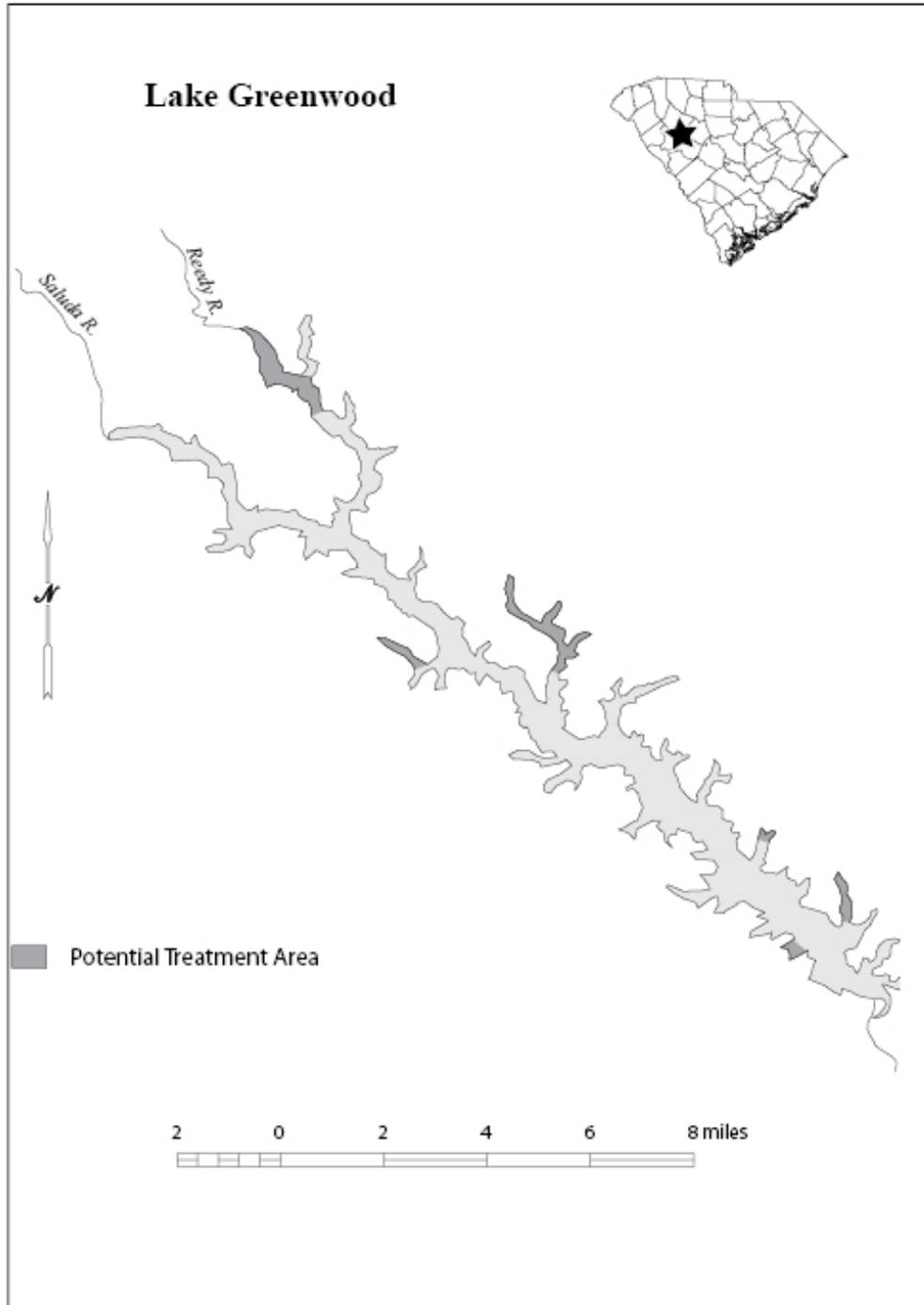
U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



## Lake Keowee (Pickens and Oconee County)

### **Problem plant species**

Hydrilla

### **Management objectives**

Keep hydrilla growth suppressed to minimize its spread within the lake, help prevent its spread to adjacent public waters and minimize adverse impacts to water use activities.

### **Selected control method**

Chelated copper \*

Fall/winter water level drawdown

\* May be toxic to fish at recommended treatment rates; however, precautions will be implemented to minimize the risk of fish kills.

### **Area to which control is to be applied**

Chelated copper - 10 acres

Drawdown - entire lake

### **Rate of control agent to be applied**

Chelated copper - up to 1 ppm (about 16 gallons per acre)

Drawdown - to the greatest extent possible within project limits.

### **Method of application of control agent**

Chelated copper - subsurface injection by airboat with adjuvant.

Drawdown - draw lake down.

### **Timing and sequence of control application**

Herbicide application - when plants are actively growing.

Drawdown - Drawdown Lake from October through February.

### **Other control application specifications**

Herbicide application - Herbicide used only upon notification of all local potable water supply authorities and approval by S.C. Department of Health and Environmental Control. Treatment of control area will be conducted in a manner that will not significantly degrade water quality.

Drawdown - Extent and duration of drawdown is dependent on operational limits of hydroelectric project, Federal regulations, electric demand, precipitation, and inflow.

**Entity to apply control system**

Herbicide application - Commercial applicator or Duke Power Company

Drawdown - Duke Power Company

**Estimated cost of control operations**

Herbicide application - \$3,553

Drawdown - Undetermined

**Potential sources of funding**

Duke Power Company 50%

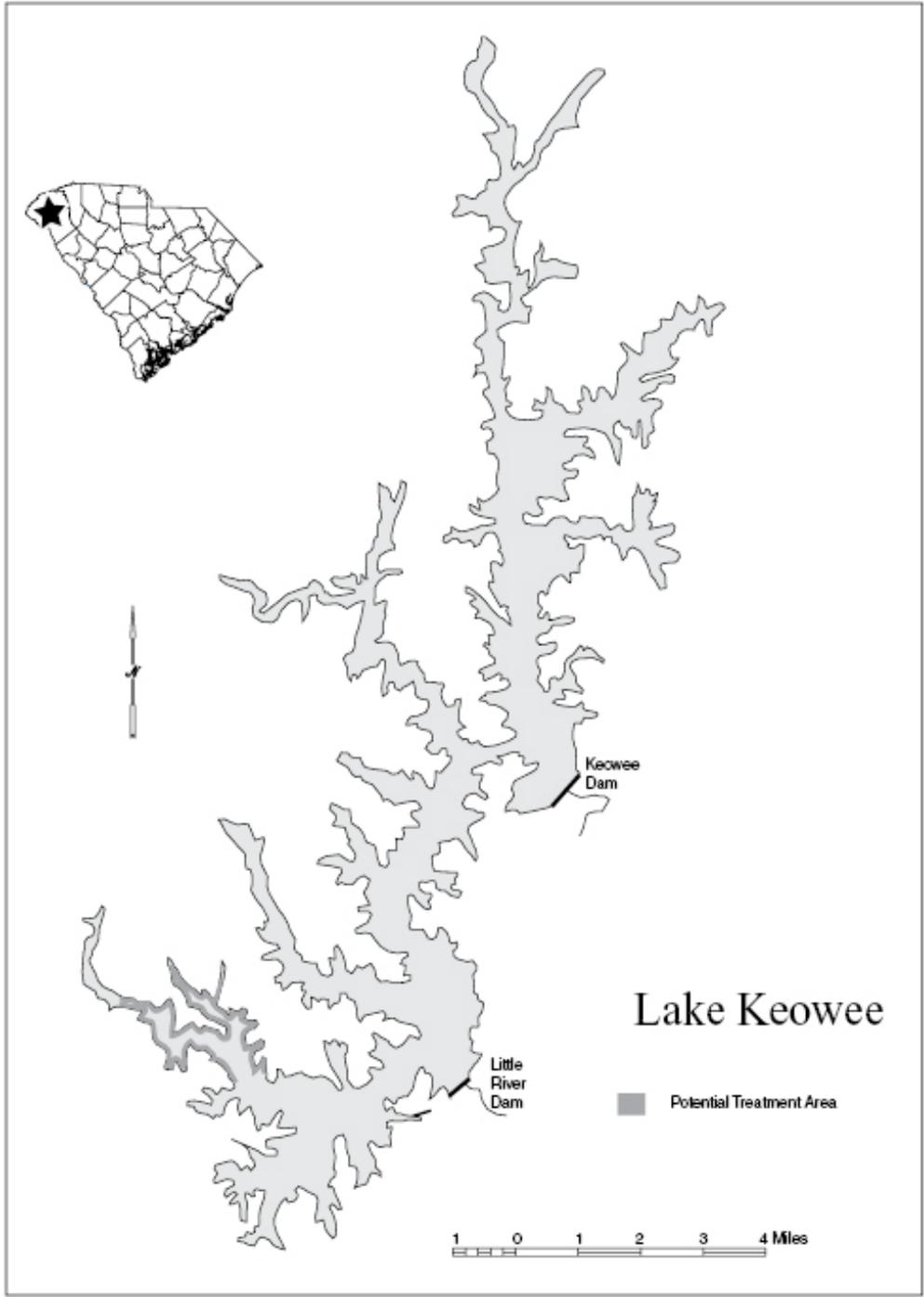
U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



## Lake Murray (Lexington, Newberry, Richland and Saluda Counties)

### Problem plant species

Hydrilla, Illinois pondweed, Water Primrose

### Management objectives

Maintain reduced hydrilla and Illinois pondweed growth throughout the lake to minimize its spread within the lake, help prevent its spread to adjacent public waters, and minimize adverse impacts to drinking water withdrawals and public use and access.

Monitor water primrose growth and consider control options if impacts are greater than anticipated.

Maintain diverse aquatic plant community through selective application of control methods and introduction of desirable native plant species.

### Selected control method

Triploid grass carp stocked in 2003 substantially reduced hydrilla coverage in Lake Murray during 2003-200. Consequently, no additional grass carp stockings are planned for these areas in 200. However, hydrilla populations and potential regrowth will be carefully monitored and in the event that survey results and regrowth warrant, the Aquatic Plant Management Council may reconsider the need for additional grass carp.

Mechanical harvester – short-term control in selected areas to provide public access and clear areas around municipal water intakes.

Aquatic herbicides - short-term control in selected areas to provide public access and clear areas around municipal water intakes.

Problem Species	Control Agents
Hydrilla	Chelated copper (Nautique)
Water primrose	Renovate 3, Habitat, Clearcast

### Area to which control is to be applied

If needed, release triploid grass carp in areas of the lake with greatest hydrilla growth.

Use mechanical harvesters or aquatic herbicides to provide immediate short-term control at high priority public access points, such as boat ramps and park sites, and municipal water intakes (75 acres of water primrose).

### Rate of control agent to be applied

If hydrilla acreage in 2008 warrants, additional grass carp may be stocked at the rate of 15 fish per vegetated acre following Council approval.

Harvest acreage as needed to provide public use, access and clear areas around municipal water intakes.

Apply aquatic herbicides to provide immediate short-term control at high priority public access points and municipal water intakes.

Chelated copper - up to 1 ppm

Renovate 3 - 0.50 to 0.75 gallons per acre.

Habitat - 2 to 4 pints per acre.

Clearcast - 1 to 4 pints per acre.

### **Method of application of control agent**

Tripliod grass carp - See section 3 above.

Use mechanical harvester as designed.

All agents to be applied when plants are actively growing.

### **Timing and sequence of control application**

If hydrilla acreage in 2009 warrants, additional grass carp may be stocked following Council approval.

Harvest aquatic growth as it becomes problematic; multiple applications are likely.

Apply herbicides to aquatic vegetation as it becomes problematic.

### **Other control application specifications**

If needed, all sterile grass carp will be a minimum of 12 inches in length. All sterile grass carp shipments for Lake Murray will be examined by the SCDNR for sterility, size, and condition at the Campbell Fish Hatchery in Columbia prior to stocking in the lake.

Harvested vegetation must be removed from the lake and deposited on high ground. The harvesting process must minimize adverse impacts to fish.

Control by Residential/Commercial Interests:

This plan is designed to provide relief from noxious aquatic vegetation for the public at large. Private entities such as lake-front residents and commercial interests may have site specific concerns not addressed immediately by the use of grass carp or mechanical harvesters at public access areas. Residential and commercial interests may remove nuisance aquatic vegetation manually or by use of mechanical harvesting devices. Of the three major control methods the following conditions apply.

1) Mechanical harvesters – Commercial aquatic plant harvesting services may be hired to remove hydrilla and Illinois pondweed from areas adjacent to residential and commercial property after notification of SCE&G. Harvesting precautions as stated in item above must be adhered to.

2) Aquatic herbicides – SCE&G opposes regular or general application of herbicides in Lake Murray, therefore, aquatic herbicides may not be applied in the lake by lake front property owners.

3) Sterile grass carp - A sufficient number of grass carp are being stocked by SCDNR to control nuisance aquatic vegetation. Stocking additional grass carp in Lake Murray without written consent by the SCDNR is prohibited.

### **Entity to apply control agent**

Triploid grass carp - Commercial supplier with supervision by the SCDNR.

Mechanical harvester – Commercial harvester under supervision of SCE&G at park sites and public boat ramps; private marina operators to contract for application at commercial boat ramps.

Aquatic herbicides - Commercial applicator under supervision by the SCDNR.

### **Estimated cost of control operations**

Triploid grass carp - None anticipated

Mechanical harvester - \$500-1000/acre

Aquatic herbicides - \$0

### **Potential sources of funding**

Triploid grass carp if needed.

S.C. Electric and Gas Company, Lexington and Richland Counties 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

Mechanical harvester, S.C. Electric and Gas Company, Commercial marina operators, and residential property owners.

Aquatic herbicides

S.C. Electric and Gas Company, Lexington and Richland Counties 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

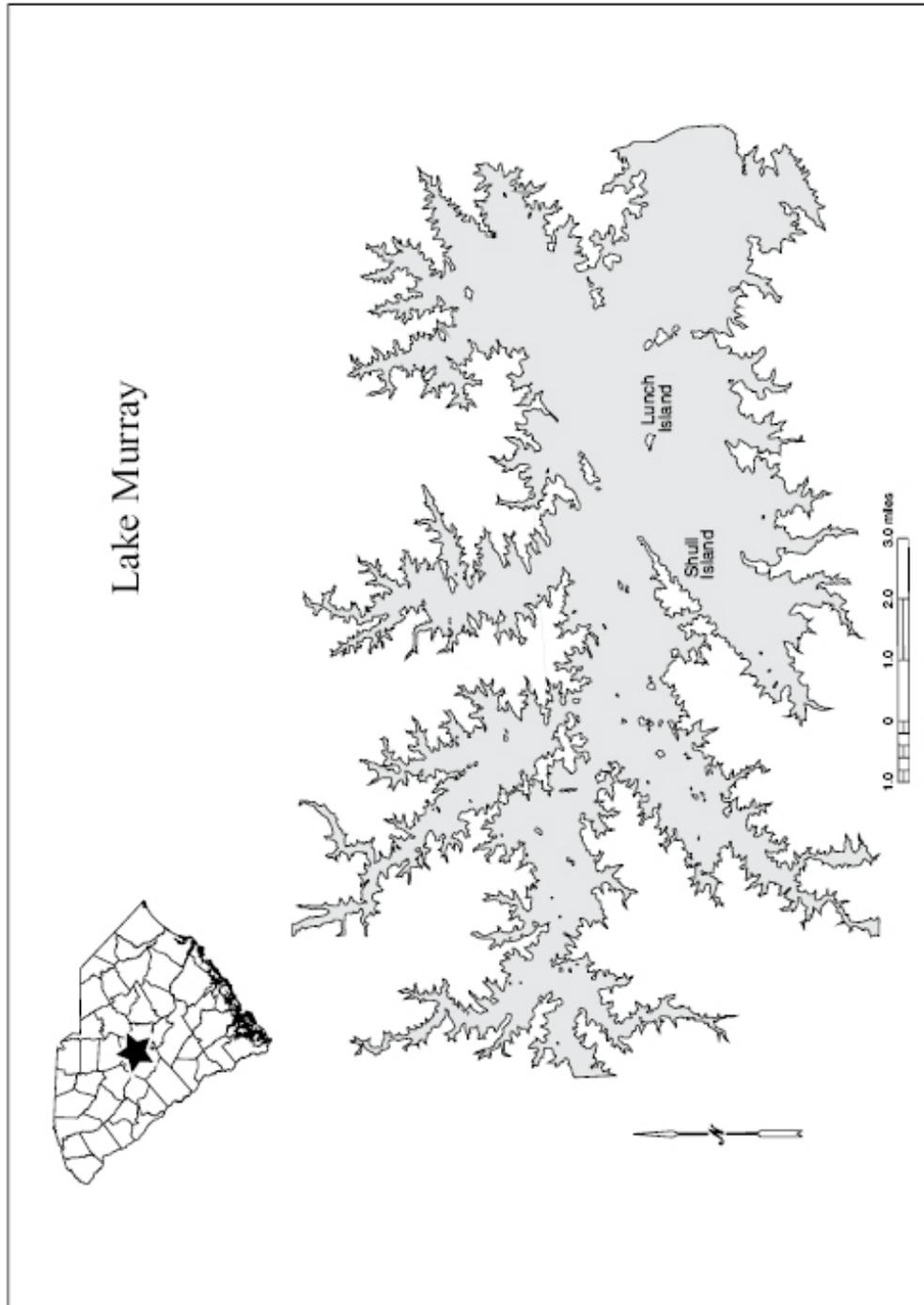
(Percentage of match subject to change based on availability of Federal and State funding.)

### **Long term management strategy**

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant

- populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
  - d) Improve public awareness and understanding of aquatic plant management activities through the maintenance of the Lake Murray Aquatic Plant Management web site. The web site includes up-to-date information on annual management plans, dates and locations of current and historical control operations, locations of habitat enhancement activities, and other pertinent information.
  - e) Periodically revise the management strategy and specific control sites as new environmental data and control agents and techniques become available and public use patterns change.
  - f) Water primrose - Water primrose, a shoreline plant, became problematic in the upper portion of the lake last year. The two-year drawdown exposed a lot of unvegetated shoreline where water primrose quickly spread and re-established at the 345-348 foot contour level. While this plant can be invasive and cause localized problems, it has been in the lake for decades and is typically not a threat to general public access and use of the waterway. Based on past experience, it is expected that most of the plants that are rooted in deep water will not survive after the lake level returns to full pool. Therefore, there are no plans to control its growth this year. However, the SCDNR and SCE&G will monitor water primrose growth and consider control options if impacts are greater than anticipated.



## Lake Wateree (Fairfield, Kershaw and Lancaster Counties)

### **Problem plant species**

Hydrilla

### **Management objective**

Keep hydrilla growth suppressed to prevent its spread within the lake, help prevent its spread to adjacent public water, and minimize adverse impacts to water use activities.

### **Selected control method**

Aquathol K

Fall/winter water level drawdown

### **Area to which control is to be applied**

Aquathol K - At least 2 acres in cove near Lakeside Marina.

Drawdown - Entire Lake

### **Rate of control agent to be applied**

Aquathol K - 4 ppm (about 8 gallons per acre depending on depth)

Drawdown - To the greatest extent possible within project limits.

### **Method of application of control agent**

Aquathol K - Subsurface injection from airboat with adjuvant.

Drawdown - Draw lake down

### **Timing and sequence of control application**

Aquathol K - 2 acres treated twice in June and again in fall of year.

Drawdown - Drawdown lake from October through February.

### **Other control application specifications**

Aquathol K - Herbicide used only upon notification of all local potable water supply authorities and approval by S.C. Department of Health and Environmental Control. Treatment of control area will be conducted in a manner that will not significantly degrade water quality.

Drawdown - Extent and duration of drawdown is dependent on operational limits of hydroelectric project, Federal regulations, electric demand, precipitation, and inflow.

### **Entity to apply control agent**

Herbicide application - Commercial applicator or Duke Power Company

Drawdown - Duke Power Company

**Estimated cost of control operations**

Herbicide application - \$3,258

Drawdown - Undetermined

**Potential sources of funding**

Duke Power Company 50%

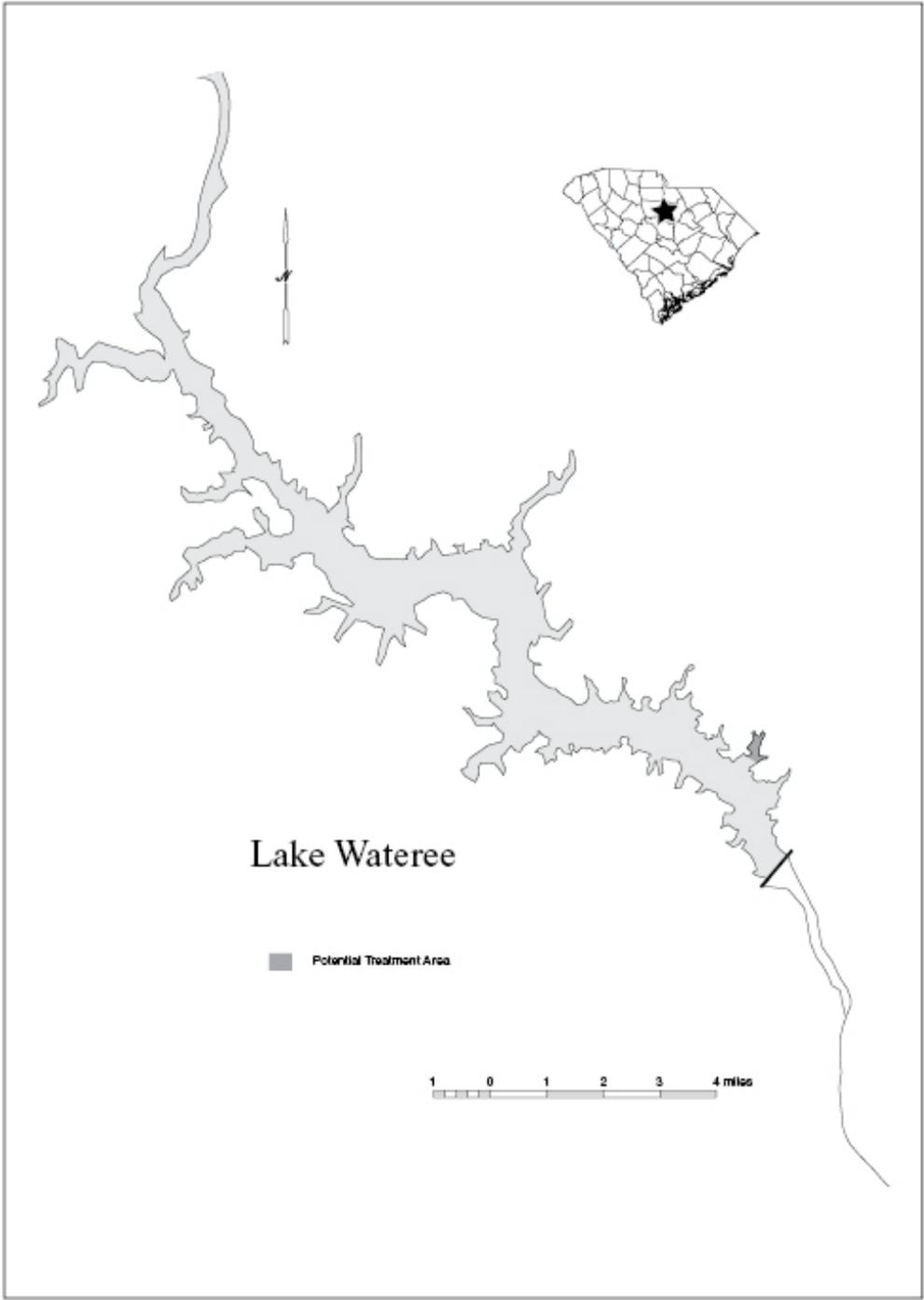
U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



## Little Pee Dee River (Marion and Horry Counties)

### Problem plant species

Alligatorweed, Water hyacinth

### Management objective

Through a comprehensive, multi-year approach; reduce water hyacinth and alligatorweed populations to the greatest extent possible

### Selected control method

Problem Species	Control Agent
Water hyacinth	Renovate 3, Reward, Clearcast, Galleon SC
Alligatorweed	Renovate 3, Reward, Habitat, Clearcast, Glyphosate
Biological Control -	Alligatorweed flea beetles, Agasicles hygrophila

### Area to which control is to be applied

50 acres of alligatorweed throughout river (30 acres of water hyacinth around Cox's Lake)

### Rate of control agent to be applied

- Habitat - 2 to 4 pints per acre.
- Reward - 2 quarts per acre.
- Renovate 3 - up to 4 quarts per acre
- Clearcast - 1 to 4 pints per acre.
- Glyphosate - up to 6 pints per acre.
- Galleon SC - 2 to 6 fl oz/acre as foliar application.

### Method of application of control agent

- Herbicide - Spray on surface of foliage with appropriate surfactant.
- Biological Control - Release in the vicinity of alligatorweed populations to supplement existing populations of alligatorweed flea beetles

### Timing and sequence of control application

Apply after plants are actively growing (May - Oct.).

### Other control application specifications

None

### Entity to apply control agent

Commercial applicator

**Estimated cost of control operations**

\$5,870

**Potential sources of funding**

Horry and Marion Counties 50%

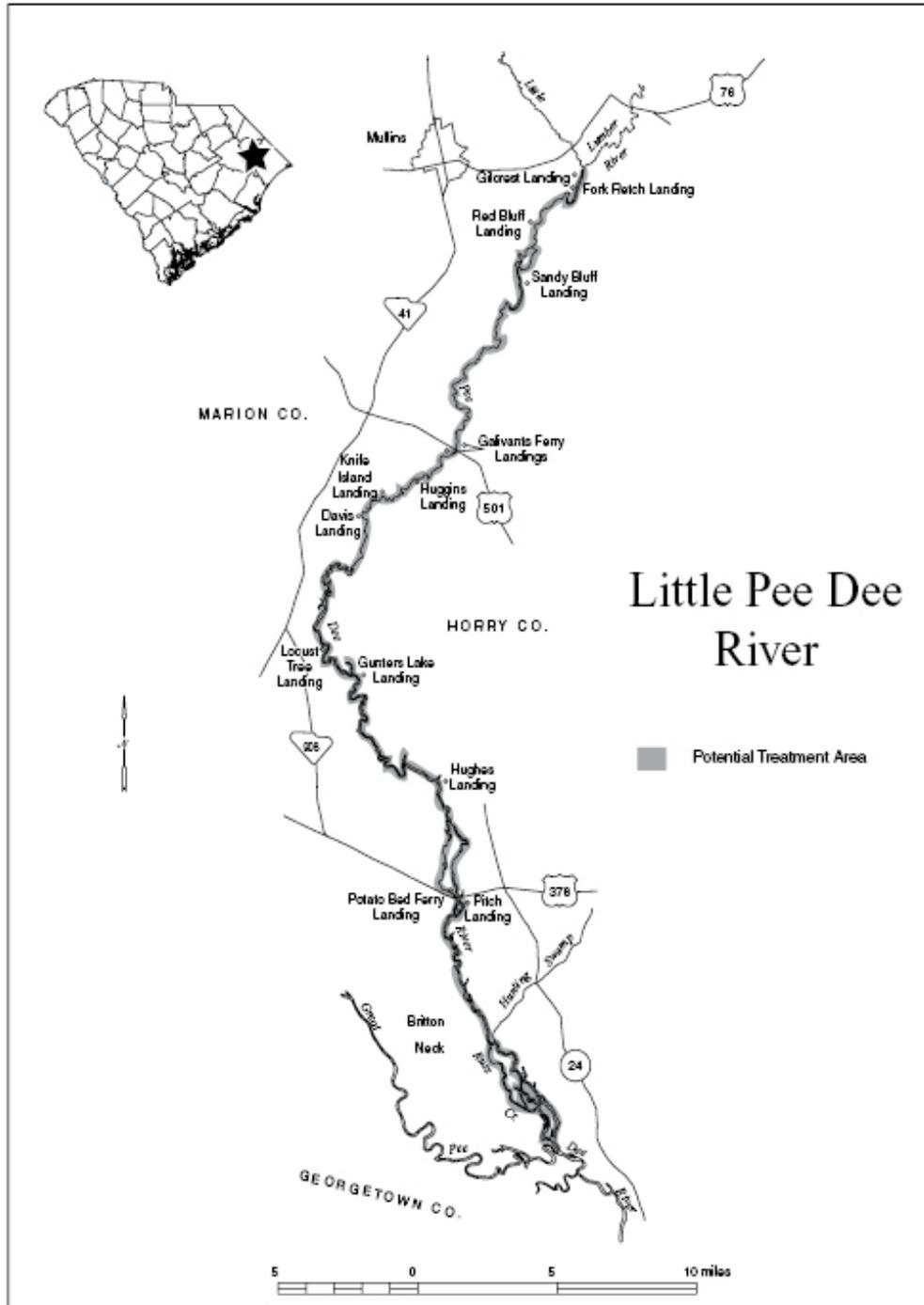
U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d) Continue to coordinate treatment areas with local conservation groups and State Scenic Rivers Coordinator.



## Lumber River (Marion and Horry Counties)

### **Problem plant species**

Alligatorweed

### **Management objective**

Reduce or remove alligatorweed infestation at public access points, the main river channel, and connecting lakes.

### **Selected control method**

Herbicides - Renovate 3, Habitat, Clearcast, Glyphosate, Galleon SC

Biological Control - Alligatorweed flea beetles, Agasicles hygrophila

### **Area to which control is to be applied**

20 acres of problematic plants throughout river

### **Rate of control agent to be applied**

Renovate 3 - 0.50 to 0.75 gallons per acre.

Habitat - up to 4 pints per acre.

Clearcast - 1 to 4 pints per acre.

Glyphosate - up to 6 pints per acre.

Galleon SC - 2 to 6 fl oz/acre as foliar application.

### **Method of application of control agent**

Herbicide - Spray on surface of foliage with appropriate surfactant.

Biological Control - Release in the vicinity of alligatorweed populations to supplement existing populations of alligatorweed flea beetles

### **Timing and sequence of control application**

Apply after plants are actively growing (May - Oct.).

### **Other control application specifications**

None

### **Entity to apply control agent**

Commercial applicator

### **Estimated cost of control operations**

\$1,535

### **Potential sources of funding**

Horry and Marion Counties 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d) Continue to coordinate treatment areas with local conservation groups and State Scenic Rivers Coordinator.

# Lumber River



## **Pee Dee River (Georgetown County)**

### **Problem plant species**

Water hyacinth, Phragmites

### **Management objective**

Through a comprehensive, multi-year approach; reduce water hyacinth and Phragmites populations to the greatest extent possible

### **Selected control method**

Problem Species	Control Agents
Water hyacinth	Reward, Renovate 3, Clearcast, Habitat, Galleon SC
Phragmites	Habitat, Clearcast

### **Area to which control is to be applied**

100 acres of water hyacinth throughout river and adjacent public ricefields.

15 acres of phragmites in the Sandy Island area and Samworth WMA.

### **Rate of control agent to be applied**

Reward - 0.5 gallons per acre.

Renovate 3 - 0.50 to 0.75 gallons per acre.

Habitat - up to 4 pints per acre.

Clearcast - 1 to 4 pints per acre.

Galleon SC - 2 to 6 fl oz/acre as foliar application.

### **Method of application of control agent**

Helicopter, airboat - 100 acres of herbicide applied to water hyacinth (Sandy Island Area 10 acres). 12 acres of Habitat applied to phragmites (Sandy Island Area 2 acres).

Other applications - 50 acres of water hyacinth applied by airboat. Spray on surface of foliage with appropriate surfactant.

### **Timing and sequence of control application**

Reward, Renovate 3, Clearcast, Habitat, Galleon SC - to be applied periodically to water hyacinth from May through October.

Habitat, Clearcast - Apply when plants are actively growing.

### **Other control application specifications**

None

**Entity to apply control agent**

Commercial applicator

**Estimated cost of control operations**

\$13,736

**Potential sources of funding**

Georgetown County 25%

U.S. Army Corps of Engineers 0%

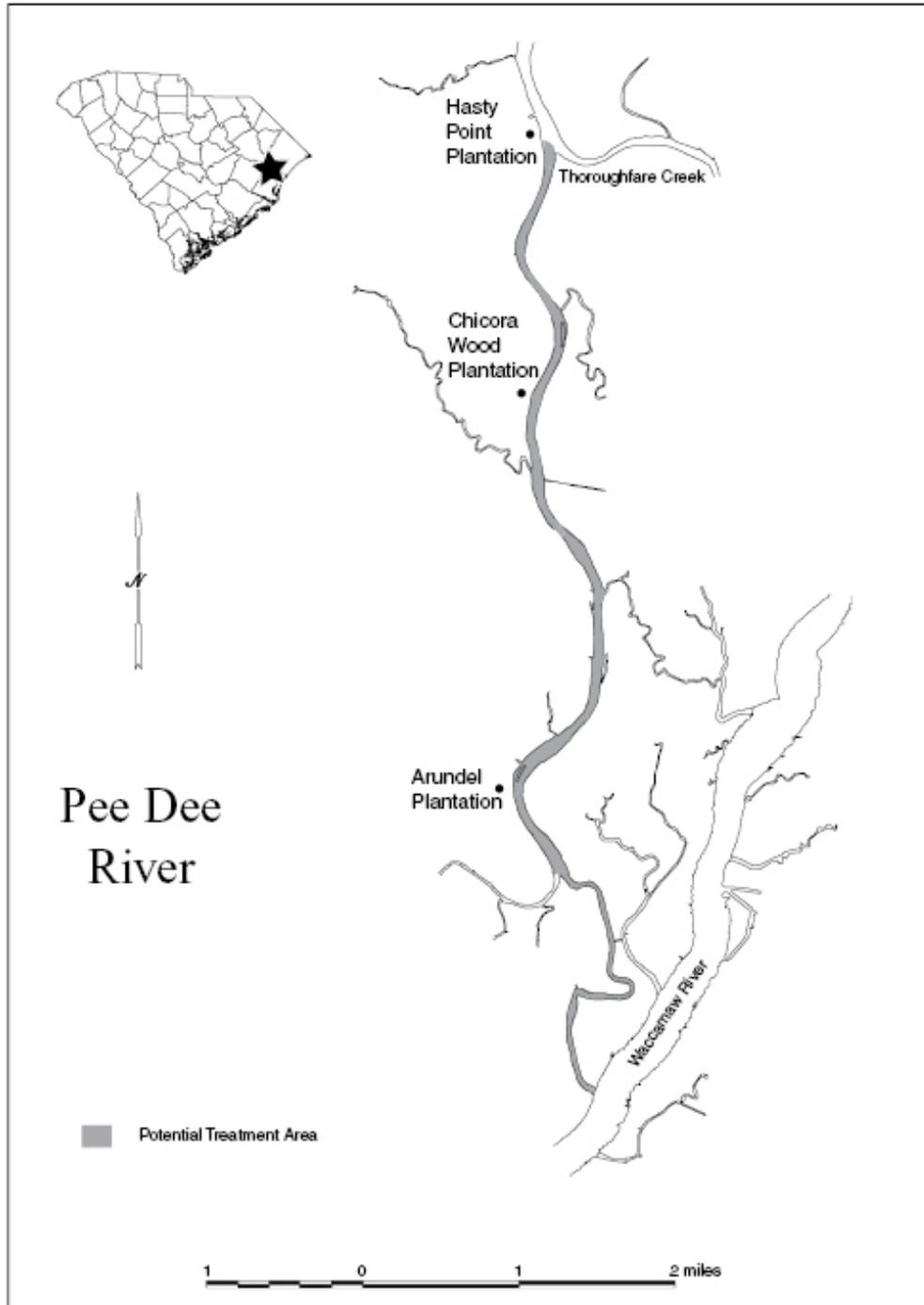
U. S. Fish and Wildlife Service 25%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



## Samworth WMA (Georgetown County)

### Problem plant species

Water hyacinth, Phragmites

### Management objective

Through a comprehensive, multi-year approach; reduce water hyacinth and Phragmites populations to the greatest extent possible

### Selected control method

Problem Species	Control Agents
Water hyacinth	Reward, Renovate 3, Clearcast, Habitat, Galleon SC
Phragmites	Habitat, Clearcast

### Area to which control is to be applied

75 acres of water hyacinth throughout river and adjacent public ricefields.

10 acres of phragmites in the Sandy Island area and Samworth WMA.

### Rate of control agent to be applied

Reward - 0.5 gallons per acre.

Renovate 3 - 0.50 to 0.75 gallons per acre.

Habitat - up to 4 pints per acre.

Clearcast - 1 to 4 pints per acre.

Galleon SC - 2 to 6 fl oz/acre as foliar application.

### Method of application of control agent

Helicopter, airboat - 75 acres of herbicide applied to water hyacinth. 10 acres of Habitat applied to phragmites.

### Timing and sequence of control application

Reward, Renovate 3, Clearcast, Habitat, Galleon SC - to be applied periodically to water hyacinth from May through October.

Habitat, Clearcast - Apply when plants are actively growing.

### Other control application specifications

None

### Entity to apply control agent

Commercial applicator

**Estimated cost of control operations**

\$12,238

**Potential sources of funding**

Georgetown County 50%

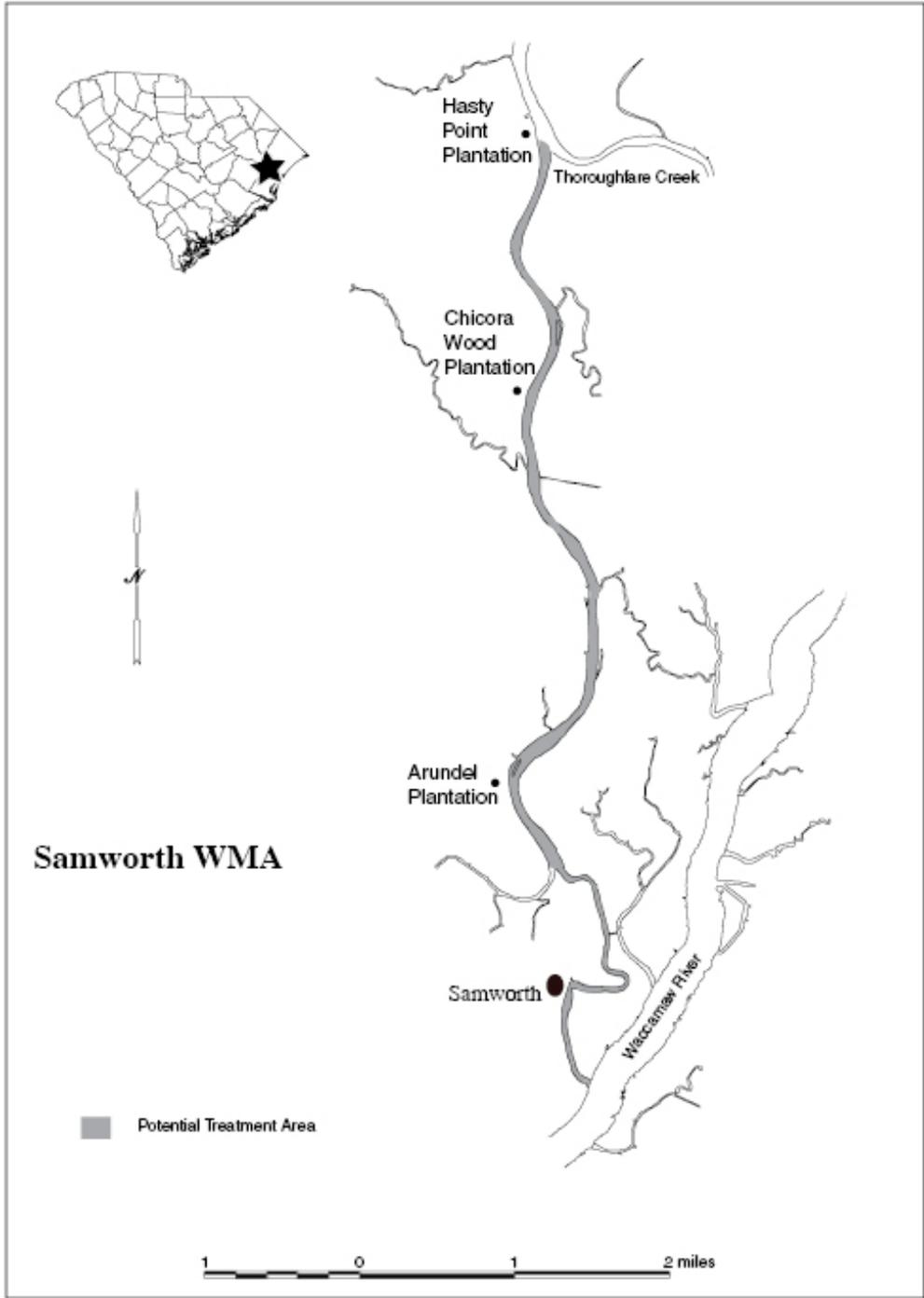
U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



## **Santee Coastal Reserve (Charleston and Georgetown Counties)**

### **Problem plant species**

Phragmites

### **Management objective**

Through a comprehensive, multi-year approach; reduce Phragmites populations to the greatest extent possible throughout the Santee Coastal Reserve.

### **Selected control method**

Habitat, Clearcast

### **Area to which control is to be applied**

200 acres of phragmites throughout the ricefields.

### **Rate of control agent to be applied**

Habitat - 3 to 6 pints per acre.

Clearcast - 3 to 6 pints per acre.

### **Method of application of control agent**

Spray on surface of foliage with appropriate surfactant.

### **Timing and sequence of control application**

Apply after plants are actively growing (May - Oct.).

### **Other control application specifications**

Application to be conducted by ground application or airboat. Helicopter applications should be utilized at a minimum of every 3 years or when substantial regrowth occurs.

### **Entity to apply control agent**

Commercial applicator

### **Estimated cost of control operations**

\$29,125

### **Potential sources of funding**

Santee Coastal Reserve 50%

U.S. Army Corps of Engineers 0%

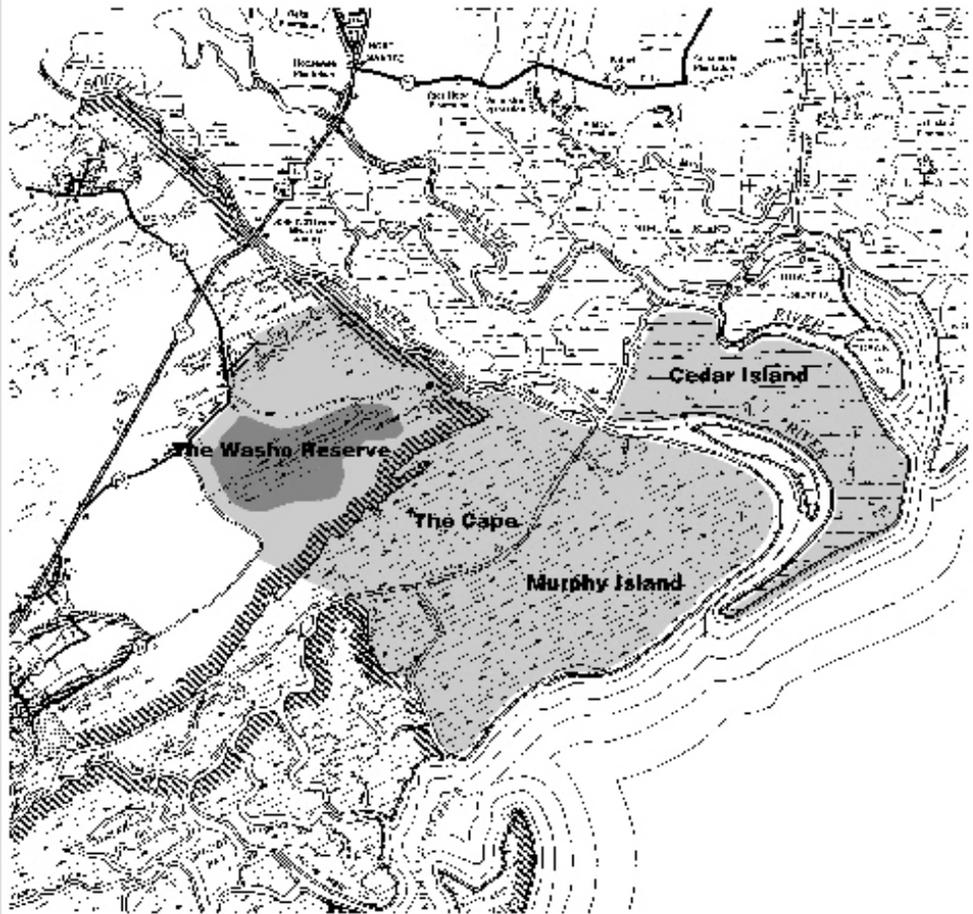
S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

# Santee Coastal Reserve



## **Santee Delta WMA (Georgetown County)**

### **Problem plant species**

Phragmites

### **Management objective**

Through a comprehensive, multi-year approach; reduce Phragmites populations to the greatest extent possible.

### **Selected control method**

Habitat, Clearcast

### **Area to which control is to be applied**

30 acres of Phragmites throughout the ricefields.

### **Rate of control agent to be applied**

Habitat - 3 to 6 pints per acre.

Clearcast - 3 to 6 pints per acre.

### **Method of application of control agent**

Spray on surface of foliage with appropriate surfactant.

### **Timing and sequence of control application**

Apply after plants are actively growing (May - Oct.).

### **Other control application specifications**

Application to be conducted by ground application or airboat. Helicopter applications should be utilized at a minimum of every 3 years or when substantial regrowth occurs.

### **Entity to apply control agent**

Commercial applicator

### **Estimated cost of control operations**

\$4,369

### **Potential sources of funding**

Santee Coastal Reserve 50%

U.S. Army Corps of Engineers 0%

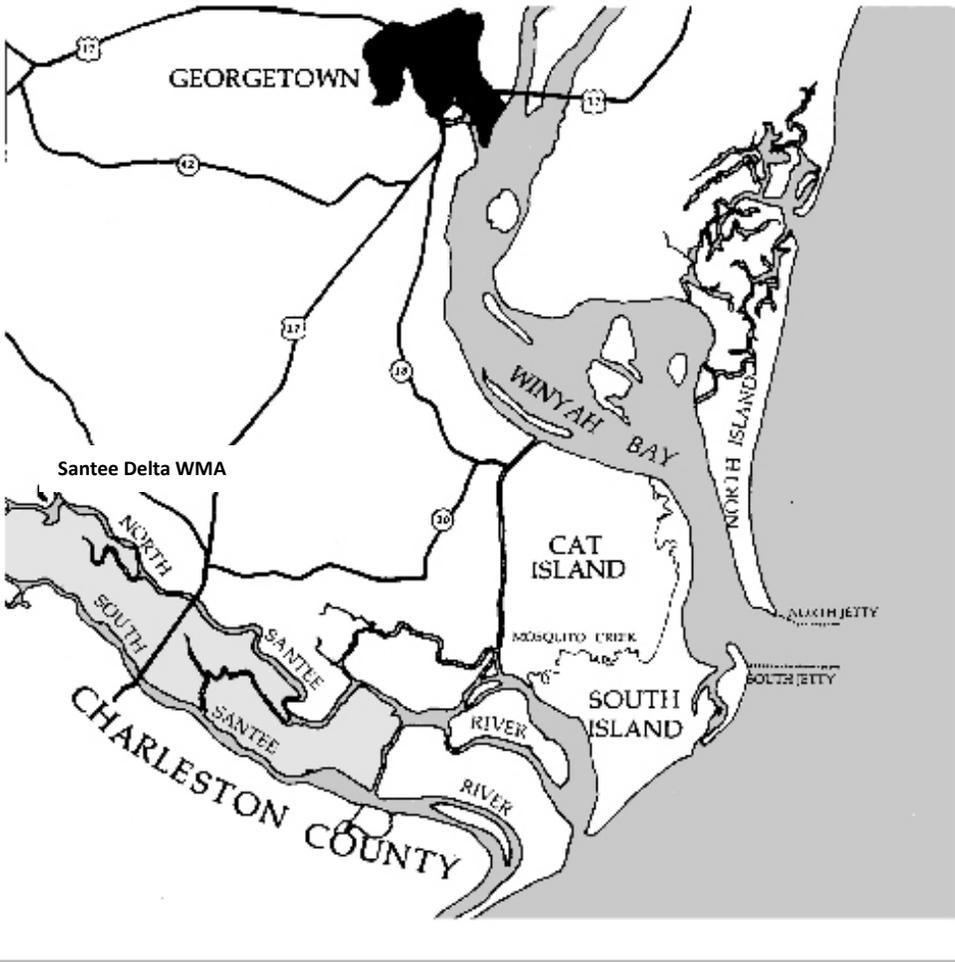
S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

# Santee Delta WMA



**U.S. Army Corps of Engineers  
Charleston Harbor/Intracoastal Waterway  
(Charleston County)**

**Problem plant species**

Phragmites

**Management objective**

Through a comprehensive, multi-year approach; reduce Phragmites populations to the greatest extent possible

**Selected control method**

Problem Species	Control Agent
Phragmites	Habitat

**Area to which control is to be applied**

255 acres of phragmites throughout area

**Rate of control agent to be applied**

Habitat - 2 to 6 pints per acre.

**Method of application of control agent**

Helicopter - 255 acres of Habitat applied to phragmites.

Other applications - Spray on surface of foliage with appropriate surfactant.

**Timing and sequence of control application**

Apply when plants are actively growing (July - Oct.).

**Entity to apply control agent**

Commercial applicator

**Other control application specifications**

None

**Estimated cost of control operations**

\$37,134

**Potential sources of funding**

U.S. Army Corps of Engineers (Charleston Harbor Funds) 100%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d) Continue to coordinate treatment areas with local conservation groups.



## US Navy, Naval Weapons Station (Charleston, Berkeley County)

### Problem plant species

Phragmites

### Management objective

Through a comprehensive, multi-year approach; reduce Phragmites populations to the greatest extent possible in spoil areas and control invasives.

### Selected control method

Problem Species	Control Agent
Phragmites	Habitat, Clearcast, Glyphosate

### Area to which control is to be applied

25 acres of Phragmites populations in dredge spoil areas.

### Rate of control agent to be applied

Habitat - 2 to 6 pints per acre.

Clearcast - 2 to 6 pints per acre

Glyphosate - up to 5 pints per acre

### Method of application of control agent

Spray on surface of foliage with appropriate surfactant.

### Timing and sequence of control application

Apply after plants are actively growing (May - Oct.).

### Other control application specifications

Application to be conducted by helicopter, airboat and jon-boat.

### Entity to apply control agent

Commercial applicator

### Estimated cost of control operations

\$3,641

### Potential sources of funding

US Naval Weapons Station 50%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

**US Navy Naval Weapons Station**



**NO MAP AVAILABLE**

## Waccamaw River (Horry County)

### Problem plant species

Water hyacinth, Phragmites

### Management objective

Through a comprehensive, multi-year approach; reduce water hyacinth and Phragmites populations to the greatest extent possible

### Selected control method

Problem Species	Control Agents
Water hyacinth	Reward, Renovate 3, Clearcast, Galleon SC
Phragmites	Habitat, Clearcast

### Area to which control is to be applied

110 acres throughout river system where needed.

### Rate of control agent to be applied

- Reward - 0.5 gallons per acre.
- Renovate 3 - 0.50 to 0.75 gallons per acre.
- Habitat - up to 4 pints per acre.
- Clearcast - 1 to 4 pints per acre.
- Galleon SC - 2 to 6 fl oz/acre as foliar application.

### Method of application of control agent

Spray on surface of foliage with appropriate surfactant

### Timing and sequence of control application

Herbicide to be applied to water hyacinth periodically from late May through November.

### Other control application specifications

Herbicide used only upon approval by S.C. Department of Health and Environmental Control. Treatment of control area will be conducted in a manner that will not significantly degrade water quality.

### Entity to apply control agent

Commercial applicator

### Estimated cost of control operations

\$ 9,131

**Potential sources of funding**

Horry County 25%

Brookgreen Gardens 25%

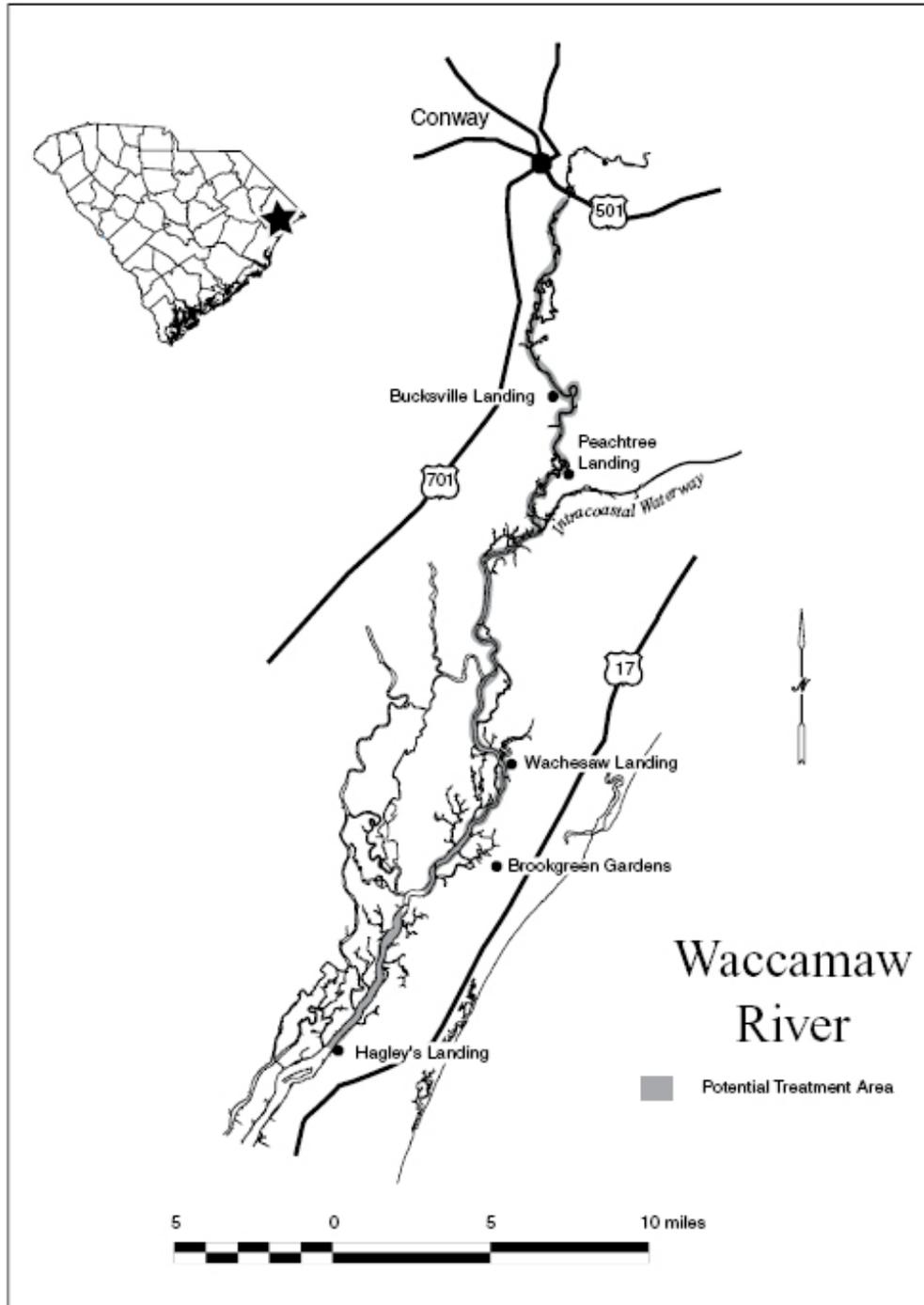
U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



## **Yawkey Wildlife Center (Georgetown County)**

### **Problem plant species**

Phragmites, Cattails, Cutgrass

### **Management objective**

Through a comprehensive, multi-year approach; reduce Phragmites populations to the greatest extent possible.

### **Selected control method**

Habitat, Clearcast, Glyphosate

### **Area to which control is to be applied**

25 acres of Phragmites, cattails, and cutgrass throughout the ricefields.

### **Rate of control agent to be applied**

Habitat - 2 to 6 pints per acre.

Clearcast - 2 to 6 pints per acre

Glyphosate - up to 5 pints per acre

### **Method of application of control agent**

Spray on surface of foliage with appropriate surfactant.

### **Timing and sequence of control application**

Apply after plants are actively growing (May - Oct.).

### **Other control application specifications**

Application to be conducted by airboat, ground, or helicopter. Phragmites control in impounded areas should only occur where drainage has left areas moderately dry

### **Entity to apply control agent**

Commercial applicator

### **Estimated cost of control operations**

\$4,906

### **Potential sources of funding**

Yawkey Foundation 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)  
(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

# Yawkey Wildlife Center



## Santee Cooper Lakes

### Lake Marion

(Calhoun, Clarendon, Orangeburg, Berkeley, and Sumter Counties)

#### Problem plant species

Hydrilla, Alligatorweed, Fanwort, Water willow, Water hyacinth, Slender naiad, Water primrose, Giant Cutgrass, Coontail, Filamentous algae (Lyngbya), Slender Pondweed, Crested floating Heart, Fragrant waterlily

#### Management objectives

Foster a diverse aquatic plant community through selective treatment of nuisance aquatic vegetation (to avoid adverse impacts to existing non-invasive plant species) and the introduction of desirable native plant species.

Manage hydrilla growth throughout the main lake and subimpoundments to minimize its spread within the lake, help prevent its spread to adjacent public waters, and minimize adverse impacts to electric power generation, agricultural irrigation withdrawals, and public use and access.

Reduce water hyacinth populations throughout the lake to enhance boating, fishing, hunting, and public access.

Reduce giant cutgrass populations throughout the lake, especially in the Hickory Top Wildlife Management Area and upper lake near Lowfalls landing, to enhance wildlife habitat and hunting opportunities.

Reduce fragrant waterlily and alligatorweed populations throughout the Santee Cooper Wildlife Management Area to enhance wildlife habitat and hunting opportunities.

Reduce other nuisance aquatic vegetation in priority use areas, such as electric power generation facilities, public and commercial access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas in the main lake and subimpoundments.

#### Selected control method

Problem Species	Control Agents
Hydrilla	Aquathol K, Sonar, chelated copper*, Triploid grass carp
Lyngbya	chelated copper*
Water hyacinth	Reward, Renovate 3, Clearcast
Fanwort, coontail, slender naiad, slender pondweed	Aquathol K, Sonar, Reward
Water primrose, alligatorweed,	Glyphosate, Habitat, Renovate 3, Clearcast-

giant cutgrass

\* May be toxic to fish at recommended treatment rates; however, precautions will be implemented to minimize the risk of fish kills.

### **Area to which control is to be applied**

Water hyacinth - Approximately 750 acres throughout lake but mostly in the upper lake area above I-95 bridge.

Hydrilla - Approximately 400 acres in priority areas such as electric power generation facilities, public and commercial access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas in the main lake and sub-impoundments. If conditions warrant, release triploid grass carp in close proximity to areas of the lake with the greatest hydrilla growth and use herbicide applications to provide immediate short-term control of localized growth in those areas.

Giant Cutgrass - Approximately 50 acres along shoreline areas throughout lake system.

Crested Floating Heart - Approximately 200 acres in priority areas such as public and commercial access sites (boat ramps, piers, swimming areas, marinas, and residential shoreline areas in the main lake).

Other target species - Approximately 100 acres in priority areas such as electric power generation facilities, public and commercial access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas in the main lake and sub-impoundments.

Sub-Impoundments -

Dean's Swamp Impoundment, Potato Creek Impoundment, Church Branch Impoundment, Taw Caw Impoundment

The general management strategy is to transition from hydrilla dominant plant communities to ones dominated by native plant species, which are beneficial to wildlife, by use of aquatic herbicides. Specific control methods for the sub-impoundments will be determined cooperatively between Santee Cooper and SCDNR staffs which are consistent with both groups' interests for control of invasive plant species such as hydrilla while promoting vegetation beneficial to wildlife and waterfowl through other habitat enhancement projects.

### **Rate of control agents to be applied**

Aquathol K - 6 to 10 gallons per acre (dependent on water depth)

Reward - 0.5 gallon per acre for floating plants; two gallons per acre for submersed plants

Renovate 3 - 0.5 to 0.75 gallons per acre for emergent species, per label for submersed plants.

Habitat - 1 to 6 pints per acre

Sonar AS - 0.075 to 0.15 ppm

Chelated Copper- up to 1 ppm

Glyphosate - up to 1 gallon per acre.

Sonar Q, Sonar PR - up to 40 ppb (approx 10 pounds/acre)

Clearcast - 1 to 4 pints per acre

Triploid grass carp – The Aquatic Plant Management Council is committed to maintenance stocking of triploid grass carp in the Santee Cooper Lakes to provide long-term control of hydrilla. A maintenance stocking plan approved in 1999 provided for the stocking of a small number of grass carp to control hydrilla while encouraging the expansion of a diverse, native aquatic plant community. The plan would be initiated only after hydrilla regrowth was apparent in areas once controlled by grass carp.

The plan was finally implemented in 2007 following a year (2006) of substantial increases in hydrilla and overall aquatic plant populations systemwide. The maintenance stocking plan called for increasing the grass carp population to the level at which hydrilla was last under control, which was in 2005, and maintaining that level in subsequent years. Drought conditions resulted in a decrease in lake levels to near historic lows in early 2008, so no carp were stocked that year. Surveys in 2008 (post-drought) indicated a substantial increase in aquatic plants and a significant regrowth of hydrilla in some areas.

After revisiting the data and much consideration, the Aquatic Plant Management Council set the target level of triploid grass carp for the Santee Cooper Lake System at 12,100 fish, the estimated number present at the beginning of 2005. Re-establishing this level will require stocking approximately 8,300 fish in 2009. Fish will be released in carefully selected locations based on the presence of hydrilla, with approximately 65% (about 5,400) in Lake Marion and 35% (2,900) going to locations in Lake Moultrie. These percentages may be adjusted based on the amount of hydrilla present at the time of stocking.

Hydrilla populations will be carefully monitored and additional maintenance stocking of fish will be considered if survey results and regrowth warrant.

### **Method of application of control agents**

Aquathol K, chelated copper, Sonar - subsurface application by airboat or surface application by helicopter.

Reward - (water hyacinths) spray on surface of foliage using handgun from airboat or by helicopter with appropriate surfactant ;( submersed plants) subsurface application.

Renovate 3, Glyphosate, Habitat, Clearcast - spray on surface of foliage with appropriate surfactant.

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

### **Timing and sequence of control application**

Herbicide applications - All herbicide applications to be applied when plants are actively growing. Water hyacinth treatments should be initiated in early spring when plant growth begins and continued regularly during the year as needed.

Tripliod grass carp to be released as soon as possible in the spring of 2009 (March-May).  
RESULTS FROM GRASS CARP MAY NOT BE EVIDENT FOR TWO OR MORE YEARS.

### **Other control application specifications**

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time.

Water hyacinth treatments should be considered a high priority to minimize spread to other areas of the lake system. Treatments should be conducted wherever the plants occur and access by boat is feasible. Frequent treatments in this area will be necessary to meet management objectives.

If available, all sterile grass carp will be a minimum of 12 inches in length. Sterile grass carp shipments for Lake Marion will be certified by the SCDNR for sterility and checked for size and condition prior to stocking in the lake.

### **Entity to apply control agents**

Herbicide application - S.C. Public Service Authority and/or commercial applicator.

Tripliod Grass Carp - S.C. Public Service Authority and/or a commercial supplier with supervision by the SCDNR.

### **Estimated cost of control operations**

\$287,800

Note: The budgeted amount is based on aquatic plant coverage and treatment needs from previous years. Actual expenditures will depend on the extent of noxious aquatic plant growth in 2009

### **Potential sources of funding**

S.C. Public Service Authority 50%

U.S. Army Corps of Engineers 0%

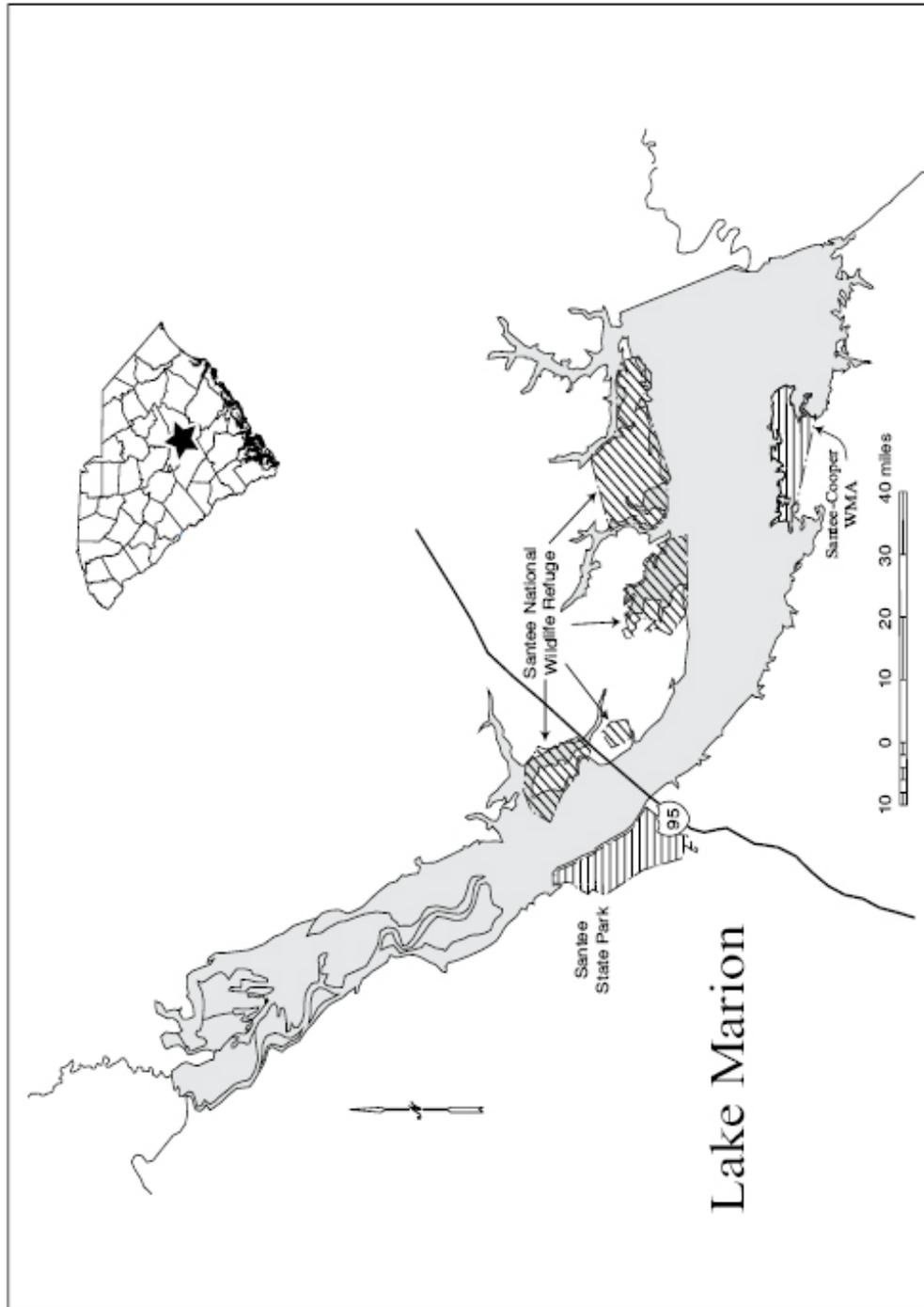
S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

### **Long term management strategy**

- a) Support the management goals established by the DNR and Santee Cooper (Appendix E) which attempts to achieve a diverse assemblage of native aquatic vegetation in 10% of the total surface area of the lake and to effectively control non-native invasive species.
- b) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

- c) A long-term integrated management strategy has been implemented to control hydrilla. Triploid grass carp have been stocked to control hydrilla growth lake-wide and approved aquatic herbicides are used to control localized growth in priority use areas. Future plans include annual maintenance stocking of grass carp to maintain the population at a level that is sufficient to maintain control of hydrilla but to minimize impacts on desirable native plant populations.
- d) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- e) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- f) Periodically revise the management strategy and specific control sites as new environmental data, management agents and techniques, and public use patterns become available.



## Lake Moultrie (Berkeley County)

### Problem plant species

Hydrilla, Slender naiad, Watermilfoil, Water willow, Water primrose, Alligatorweed, Fanwort, Water hyacinth, Giant Cutgrass

### Management objectives

Foster a diverse aquatic plant community through selective treatment of nuisance aquatic vegetation (to avoid adverse impacts to existing non-invasive plant species) and the introduction of desirable native plant species.

Manage hydrilla growth throughout the main lake and subimpoundments to minimize its spread within the lake, help prevent its spread to adjacent public waters, and minimize adverse impacts to electric power generation, agricultural irrigation withdrawals, and public use and access.

Reduce water hyacinth populations throughout the lake to enhance boating, fishing, hunting, and public access.

Reduce giant cutgrass populations throughout the lake to enhance wildlife habitat and hunting opportunities.

Reduce other nuisance aquatic vegetation in priority use areas, such as electric power generation facilities, public and commercial access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas.

### Selected control method

Problem Species	Control Agents
Hydrilla	Aquathol K, Sonar, Triploid grass carp**Chelated Copper
Water hyacinth	Reward, Renovate 3
Fanwort, slender naiad, watermilfoil	Aquathol K, Sonar, Reward, Renovate 3
Water primrose, alligatorweed, giant cutgrass	Glyphosate, Habitat, Renovate 3

\* May be toxic to fish at recommended treatment rates; however, precautions will be implemented to minimize the risk of fish kills.

### Area to which control is to be applied

Hydrilla, fanwort, watermilfoil - Approximately 80 acres in priority areas such as electric power generation facilities, public and commercial access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas and sub-impoundments. If conditions warrant, release triploid grass carp in close proximity to areas of the lake with

the greatest hydrilla growth and use herbicide applications to provide immediate short-term control of localized growth in those areas.

Giant cutgrass, water primrose, alligatorweed - Approximately 90 acres along shoreline areas throughout the lake.

Sub -Impoundments - Stoney Bay Impoundment - The general management strategy is to transition from hydrilla dominant plant communities to ones dominated by native plant species, which are beneficial to wildlife, by use of aquatic herbicides. Specific control methods for the sub-impoundments will be determined cooperatively between Santee Cooper and SCD-NR staffs which are consistent with both groups' interests for control of invasive plant species such as hydrilla while promoting vegetation beneficial to wildlife and waterfowl through other habitat enhancement projects.

### **Rate of control agents to be applied**

Aquathol K - 6 to 10 gallons per acre (dependent on water depth)

Reward - 0.5 gallon per acre for floating plants; two gallons per acre for submersed plants

Renovate 3 - 0.5 to 0.75 gallons per acre for emergent species, per label for submersed plants.

Habitat - 1 to 6 pints per acre

Sonar AS - 0.075 to 0.15 ppm in treatment area

Chelated copper - up to 1 ppm Glyphosate- up to 1 gallon per acre.

Sonar Q, Sonar PR - up to 40 ppb (approx 10 pounds/acre) Clearcast - 1 to 4 pints per acre

Other approved aquatic herbicides - as per label instructions.

Triploid grass carp – The Aquatic Plant Management Council is committed to maintenance stocking of triploid grass carp in the Santee Cooper Lakes to provide long-term control of hydrilla. A maintenance stocking plan approved in 1999 provided for the stocking of a small number of grass carp to control hydrilla while encouraging the expansion of a diverse, native aquatic plant community. The plan would be initiated only after hydrilla regrowth was apparent in areas once controlled by grass carp.

The plan was finally implemented in 2007 following a year (2006) of substantial increases in hydrilla and overall aquatic plant populations system wide. The maintenance stocking plan called for increasing the grass carp population to the level at which hydrilla was last under control, which was in 2005, and maintaining that level in subsequent years. Drought conditions resulted in a decrease in lake levels to near historic lows in early 2008, so no carp were stocked that year. Surveys in 2008 (post-drought) indicated a substantial increase in aquatic plants and a significant regrowth of hydrilla in some areas.

After revisiting the data and much consideration, the Aquatic Plant Management Council set the target level of triploid grass carp for the Santee Cooper Lake System at 12,100 fish, the estimated number present at the beginning of 2005. Re-establishing this level will require stocking approximately 8,300 fish in 2009. Fish will be released in carefully selected locations based on the presence of hydrilla, with approximately 65% (about 5,400) in Lake

Marion and 35% (2,900) going to locations in Lake Moultrie. These percentages may be adjusted based on the amount of hydrilla present at the time of stocking.

Hydrilla populations will be carefully monitored and additional maintenance stocking of fish will be considered if survey results and regrowth warrant.

### **Method of application of control agents**

Aquathol K, chelated copper, Sonar, - subsurface application by airboat or surface application by helicopter.

Reward - (water hyacinths) spray on surface of foliage using handgun from airboat or by helicopter with appropriate surfactant; (submersed plants) subsurface application.

Renovate 3, Glyphosate, Habitat, Clearcast - spray on surface of foliage with appropriate surfactant.

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

### **Timing and sequence of control application**

All herbicides to be applied when plants are actively growing. If needed, aerial treatment of hydrilla adjacent to the Rediversion Canal entrance should be performed as early as possible to prevent excessive plant growth and avoid impacts to the St. Stephen Hydropower Plant.

Triploid grass carp – If conditions warrant, triploid grass carp to be released as soon as possible.

### **Other control application specifications**

Herbicide used only upon approval by the S.C. Department of Health and Environmental Control.

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time.

Treatment of lake, especially near the Rediversion Canal, should be coordinated with hydropower production to avoid excessive flows and maximize herbicide contact time.

If available, all sterile grass carp will be a minimum of 12 inches in length. Sterile grass carp shipments for Lake Moultrie will be certified by the SCDNR for sterility and checked for size and condition prior to stocking in the lake.

### **Entity to apply control agent**

Herbicide application - S.C. Public Service Authority and/or commercial applicator.

Triploid Grass Carp - S.C. Public Service Authority and/or a commercial supplier with supervision by the SCDNR.

### **Estimated cost of control operations**

\$30,335

Note: The budgeted amount is based on aquatic plant coverage and treatment needs from previous years. Actual expenditures will depend on the extent of noxious aquatic plant growth in 2009

### **Potential sources of funding**

S.C. Public Service Authority 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

### **Long term management strategy**

- a) Support the management goals established by the DNR and Santee Cooper (Appendix E) which attempts to achieve a diverse assemblage of native aquatic vegetation in 10% of the total surface area of the lake and to effectively control non-native invasive species.
- b) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- c) A long-term integrated management strategy has been implemented to control hydrilla. Triploid grass carp have been stocked to control hydrilla growth lake-wide and approved aquatic herbicides are used to control localized growth in priority use areas. Future plans include annual maintenance stocking of grass carp to maintain the population at a level that is sufficient to maintain control of hydrilla but to minimize impacts on desirable native plant populations.
- d) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- e) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the waterbody, and enforcement of existing laws and regulations.
- f) Periodically revise the management strategy and specific control sites as new environmental data, management agents and techniques, and public use patterns become available.



**South Carolina Department of Parks, Recreation and Tourism  
State Park Lakes**

**Barnwell State Park (Swimming Lake)  
(Barnwell County)**

**Problem plant species**

Waterlily

**Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

**Selected control method**

Hardball

**Area to which control is to be applied**

3 acres in swimming lake.

**Rate of control agent to be applied**

Up to 5 gallons per acre

**Method of application of control agent**

Subsurface injection from airboat.

**Timing and sequence of control application**

Apply when plants are actively growing.

**Other control application specifications**

Monitor plant growth prior to treatment.

**Entity to apply control agent**

Commercial applicator contracted and monitored by SCPRT.

**Estimated cost of control operations**

\$603

**Potential sources of funding**

S.C. Department of Parks, Recreation and Tourism 50%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

# Barnwell State Park Swimming Lake



## Charles Towne Landing State Park (Charleston County)

### Problem plant species

Duckweed, Alligatorweed, Pennywort

### Management objective

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

### Selected control method

Problems species	Control Agent
Duckweed	Fluridone, Galleon SC
Alligatorweed	Renovate 3
Pennywort	Glyphosate

### Area to which control is to be applied

Fluridone, Galleon SC - 3 acres

Glyphosate - 2 acres

Renovate - 1 acre

### Rate of control agents to be applied

Fluridone - 1 pint per acre

Glyphosate - 5 pints per acre

Renovate - 0.5 to 0.75 gals/acre

Galleon SC - 2 to 12 fl oz/acre.

### Method of application of control agents

Fluridone, Galleon SC - Apply subsurface throughout lake

Glyphosate, Renovate - Spray on surface of foliage with appropriate surfactant

### Timing and sequence of control application.

Herbicides to be applied when plants are actively growing

### Other control application specifications

None

### Entity to apply control agent

Commercial applicator contracted and monitored by SCPRT.

**Estimated cost of control operations**

\$1,236

**Potential sources of funding**

S.C. Department of Parks, Recreation and Tourism 50%

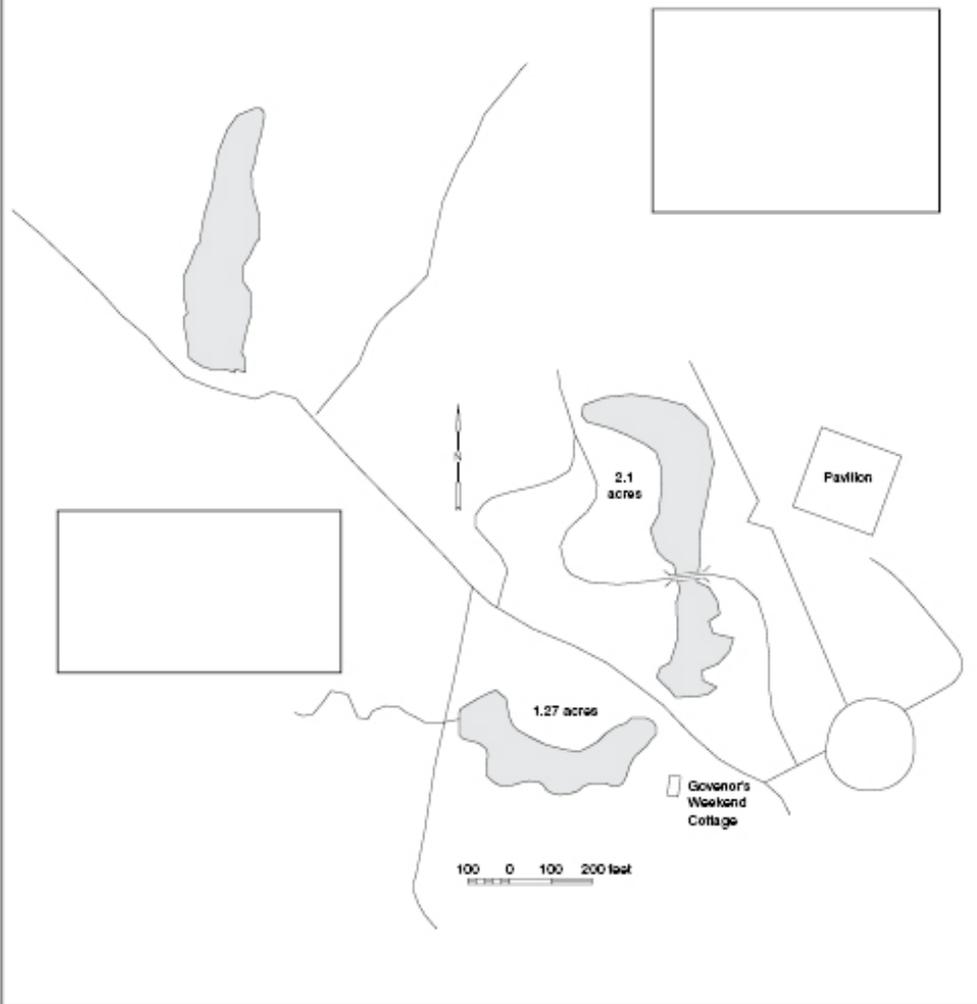
S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

# Charles Towne Landing State Park



## **H. Cooper Black State Recreation Area (Chesterfield County)**

### **Problem plant species**

Waterlily, Watershield

### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

### **Selected control method**

Hardball

### **Area to which control is to be applied**

2 acres in lake.

### **Rate of control agent to be applied**

Up to 5 gallons per acre

### **Method of application of control agent**

Subsurface injection from airboat.

### **Timing and sequence of control application**

Apply when plants are actively growing.

### **Other control application specifications**

Monitor plant growth prior to treatment.

### **Entity to apply control agent**

Commercial applicator contracted and monitored by SCPRT.

### **Estimated cost of control operations**

\$402

### **Potential sources of funding**

S.C. Department of Parks, Recreation and Tourism 50%

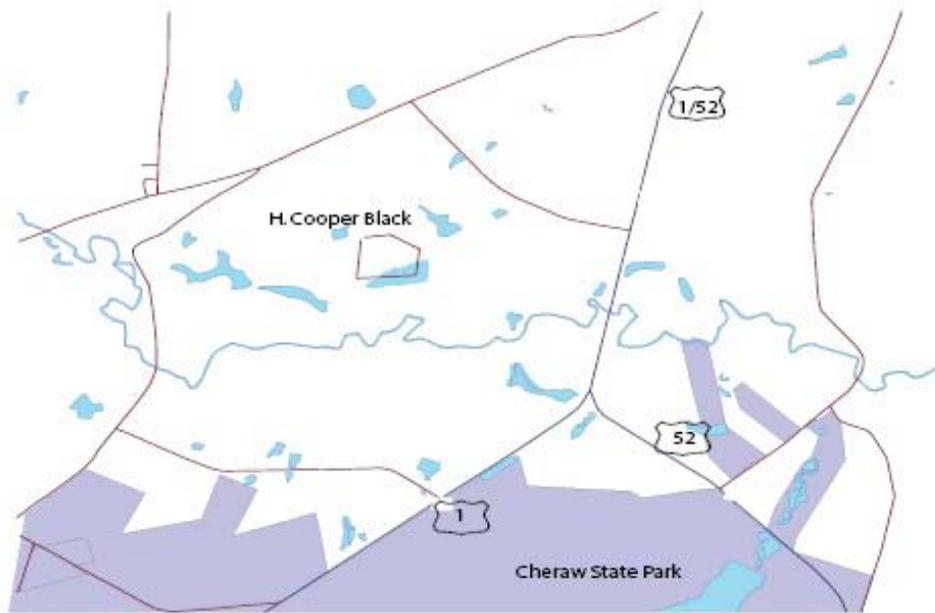
S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

# H. Cooper Black Recreation Area



## Huntington Beach State Park (Georgetown County)

### **Problem plant species**

Phragmites, Cutgrass, Cattails

### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

### **Selected control method**

Habitat, Clearcast

### **Area to which control is to be applied**

15 acres in 3 different lakes.

### **Rate of control agent to be applied**

Habitat - up to 4 pints per acre.

Clearcast - 1 to 4 pints per acre.

Galleon SC - 2 to 6 fl oz/acre as foliar application.

### **Method of application of control agent**

Spray on surface of foliage with appropriate surfactant.

### **Timing and sequence of control application**

Apply after plants are actively growing (May - Oct.).

### **Other control application specifications**

Application to be conducted by airboat, ground, or helicopter. Phragmites control in impounded areas should only occur where drainage has left areas moderately dry

### **Entity to apply control agent**

Commercial applicator

### **Estimated cost of control operations**

\$1,643

### **1Potential sources of funding**

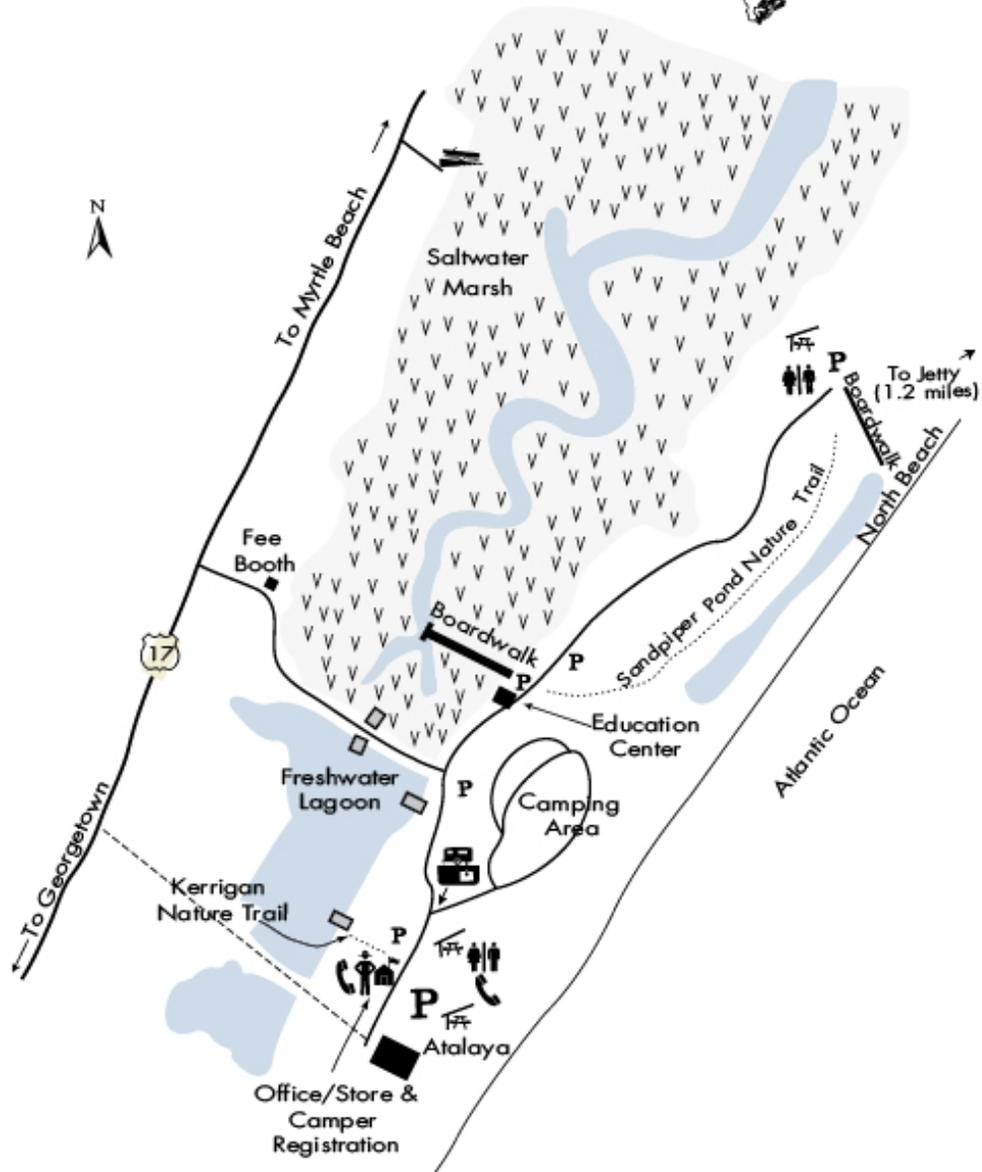
S.C. Department of Parks, Recreation and Tourism 50%

S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

# Huntington Beach SP



## **Kings Mountain State Park - Crawford Lake (York County)**

### **Problem plant species**

Slender naiad

### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

### **Selected control method**

Aquathol K

### **Area to which control is to be applied**

4 acres in swimming and paddle boat area

### **Rate of control agent to be applied**

Four gallons per acre.

### **Method of application of control agent**

Apply subsurface throughout lake

### **Timing and sequence of control application**

Apply in May or June when naiad growth is initiated.

### **Other control application specifications**

Monitor plant growth prior to treatment.

### **Entity to apply control agent**

Commercial applicator contracted and monitored by SCPRT.

### **Estimated cost of control operations**

\$1,120

### **Potential sources of funding**

S.C. Department of Parks, Recreation and Tourism 50%

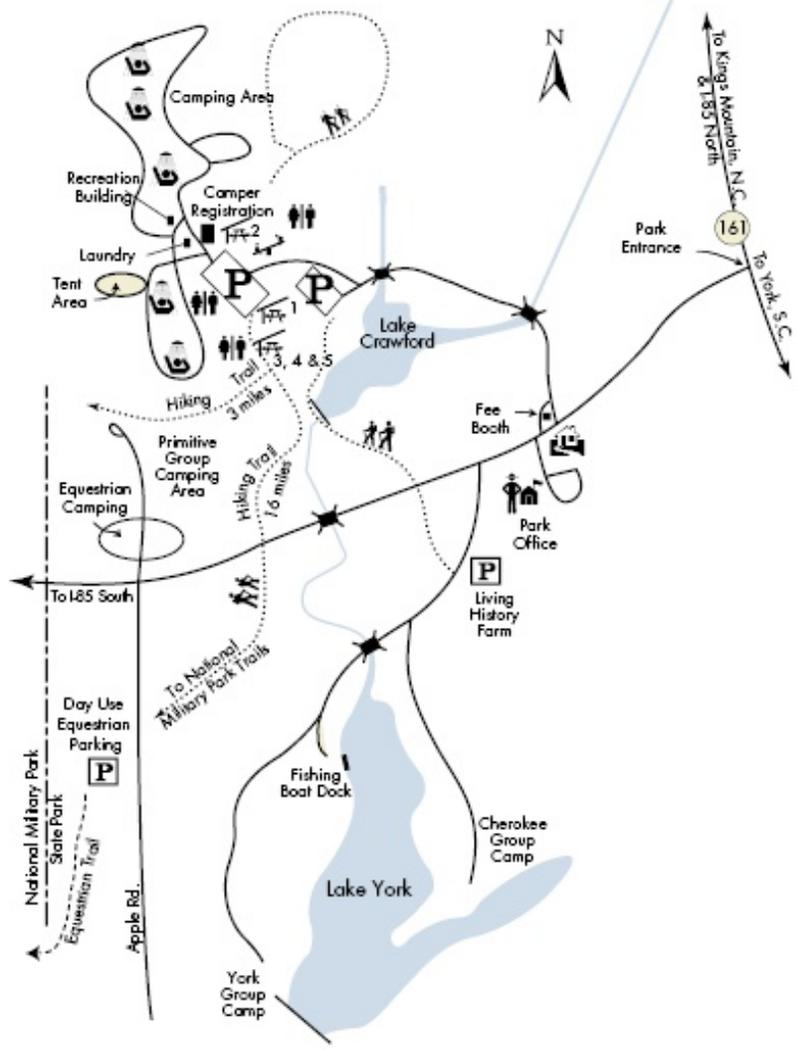
S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

# Kings Mountain SP Lake Crawford



## **Little Pee Dee State Park (Dillon County)**

### **Problem plant species**

Spikerush, Cowlily

### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

### **Selected control method**

Hardball

### **Area to which control is to be applied**

10 acres adjacent to the parks day use area, along the park dam and adjacent to the campground

### **Rate of control agent to be applied**

Up to 5 gallons per acre.

### **Method of application of control agent**

Subsurface injection from airboat.

### **Timing and sequence of control application**

Apply when plants are actively growing.

### **Other control application specifications**

Monitor plant growth prior to treatment.

### **Entity to apply control agent**

Commercial applicator contracted and monitored by SCPRT.

### **Estimated cost of control operations**

\$2,010

### **Potential sources of funding**

S.C. Department of Parks, Recreation and Tourism 50%

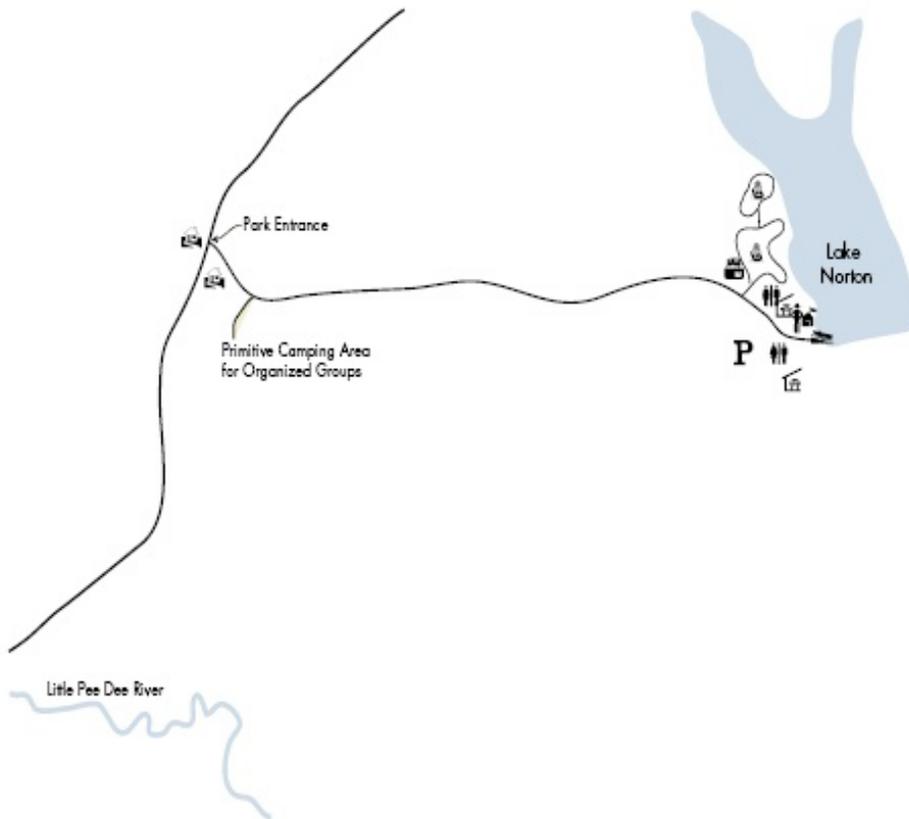
S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

# Little Pee Dee SP Lake Norton



## **N.R. Goodale State Park (Kershaw County)**

### **Problem plant species**

Waterlily, Watershield

### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

### **Selected control method**

Hardball

### **Area to which control is to be applied**

2 acres in lake.

### **Rate of control agent to be applied**

Up to 5 gallons per acre

### **Method of application of control agent**

Subsurface injection from airboat.

### **Timing and sequence of control application**

Apply when plants are actively growing.

### **Other control application specifications**

Monitor plant growth prior to treatment.

### **Entity to apply control agent**

Commercial applicator contracted and monitored by SCPRT.

### **Estimated cost of control operations**

\$402

### **Potential sources of funding**

S.C. Department of Parks, Recreation and Tourism 50%

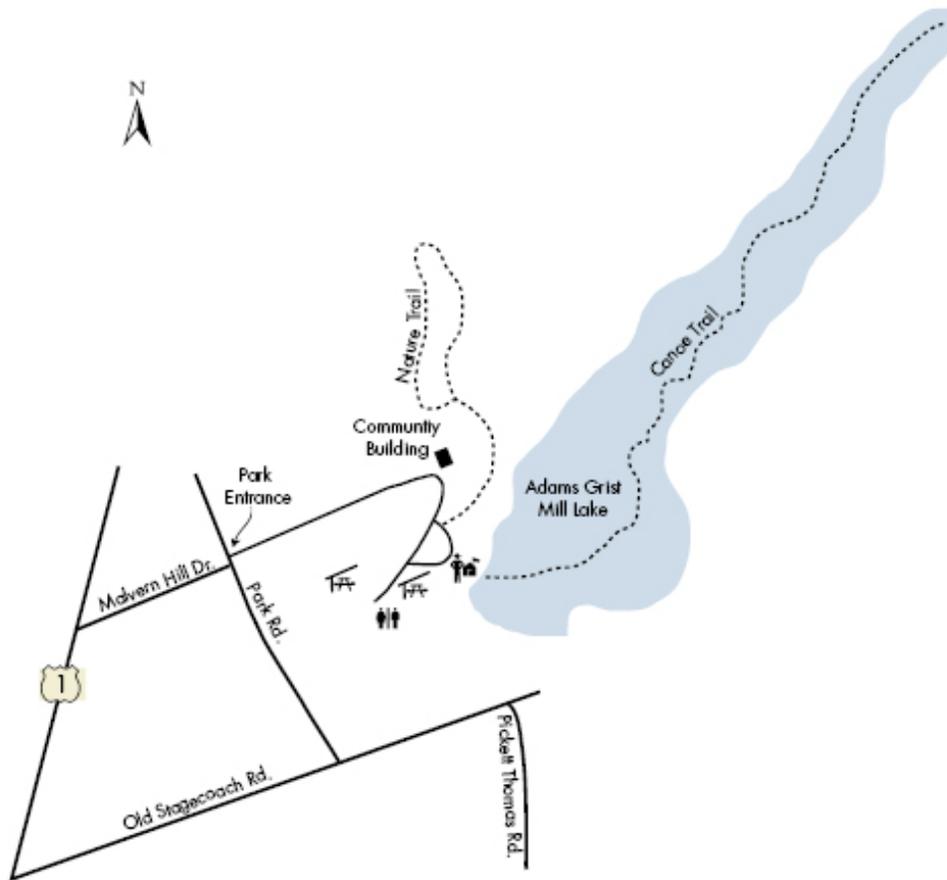
S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

# N.R. Goodale State Park



## **Santee State Park - Swimming Lake (Orangeburg County)**

### **Problem plant species**

Coontail

### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

### **Selected control method**

Reward (diquat)

### **Area to which control is to be applied**

10 acres

### **Rate of control agent to be applied**

2 gallons per acre

### **Method of application of control agent**

Subsurface injection from airboat.

### **Timing and sequence of control application**

Apply when plants are actively growing.

### **Other control application specifications**

Monitor plant growth prior to treatment.

### **Entity to apply control agent**

Commercial applicator contracted and monitored by SCPRT.

### **Estimated cost of control operations**

\$2,400

### **Potential sources of funding**

S.C. Department of Parks, Recreation and Tourism 50%

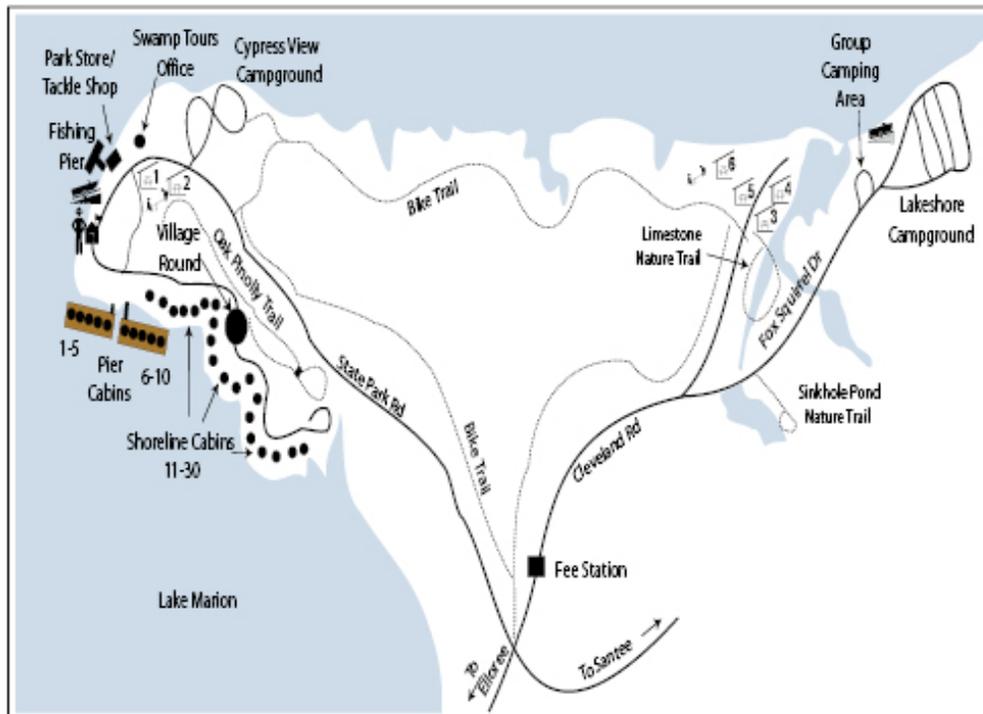
S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

# Santee State Park Swimming Lake



## **Sesquicentennial State Park (Richland County)**

### **Problem plant species**

Waterlily, Watershield

### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

### **Selected control method**

Hardball

### **Area to which control is to be applied**

5 acres in swimming and bank fishing portions of the lake.

### **Rate of control agent to be applied**

Up to 5 gallons per acre

### **Method of application of control agent**

Subsurface injection from airboat.

### **Timing and sequence of control application**

Apply when plants are actively growing.

### **Other control application specifications**

Monitor plant growth prior to treatment.

### **Entity to apply control agent**

Commercial applicator contracted and monitored by SCPRT.

### **Estimated cost of control operations**

\$1,005

### **Potential sources of funding**

S.C. Department of Parks, Recreation and Tourism 50%

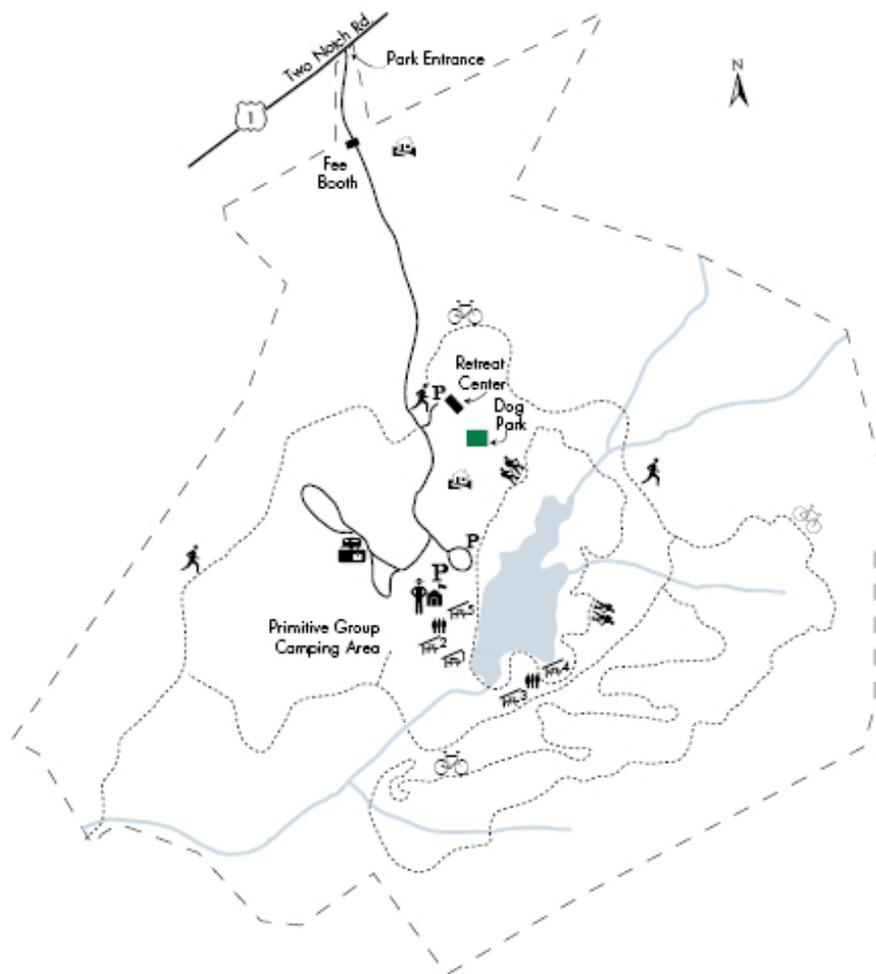
S.C. Department of Natural Resources 50% (up to \$40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

# Sesquicentennial State Park



**South Carolina Department of Natural Resources**  
**State Lakes**

\*Total price and cost share is for herbicide costs only based on state contract costs. Freshwater Fisheries staff will apply based on label rates.

**Lake Cherokee**  
**(Cherokee County)**

**Problem plant species**

Water primrose

**Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

**Selected control method**

Renovate 3

**Area to which control is to be applied**

5 acres in lake, two (2) times per year.

**Rate of control agent to be applied**

Renovate 3 - 0.5- 0 gals/acre

**Method of application of control agent**

Spray on surface of foliage with appropriate surfactant

**Timing and sequence of control application**

Apply when plants are actively growing.

**Other control application specifications**

Monitor plant growth prior to treatment.

**Entity to apply control agent**

SCDNR-Wildlife and Freshwater Fisheries Division, Lake Management staff.

**Estimated cost of control operations**

\$962\*

**Potential sources of funding**

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

**Lake Edwin Johnson  
(Spartanburg County)**

**Problem plant species**

Water primrose, Hydrilla, Pondweed

**Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

**Selected control method**

Problems species	Control Agent
Water Primrose	Renovate 3
Pondweed	Komeen/Reward
Hydrilla	Komeen/Reward

**Area to which control is to be applied**

Primrose - 7 acres in lake two (2) times per year.

Hydrilla/Pondweed - 3 acres in lake two (2) times per year.

**Rate of control agent to be applied**

Renovate 3 - 0.50 - 0 gals/acre

Komeen/Reward - 4 gals/acre / 2 gals/acre

**Method of application of control agent**

Hydrilla, Pondweed -Apply subsurface throughout lake

Water primrose - Spray on surface of foliage with appropriate surfactant

**Timing and sequence of control application**

Apply when plants are actively growing.

**Other control application specifications**

Monitor plant growth prior to treatment.

**Entity to apply control agent**

SCDNR-Wildlife and Freshwater Fisheries Division, Lake Management staff.

**Estimated cost of control operations**

\$2,939\*

**Potential sources of funding**

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

## Jonesville Reservoir (Union County)

### **Problem plant species**

Water primrose, Pondweed

### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

### **Selected control method**

Renovate 3, Glyphosate

### **Area to which control is to be applied**

10 acres in lake.

### **Rate of control agent to be applied**

Renovate 3 - 0.50 - 0 gals/acre

Glyphosate - 6 - 5 pints/acre

### **Method of application of control agent**

Spray on surface of foliage with appropriate surfactant

### **Timing and sequence of control application**

Apply when plants are actively growing.

### **Other control application specifications**

Monitor plant growth prior to treatment.

### **Entity to apply control agent**

SCDNR-Wildlife and Freshwater Fisheries Division, Lake Management staff.

### **Estimated cost of control operations**

\$1,155\*

### **Potential sources of funding**

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

### **Mountain Lakes (Chester County)**

#### **Problem plant species**

Water primrose, Alligatorweed, Parrotfeather

#### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

#### **Selected control method**

Renovate 3, Glyphosate

#### **Area to which control is to be applied**

5 acres in lake.

#### **Rate of control agent to be applied**

Renovate 3 - 0.50 - 0 gals/acre

Glyphosate - 6 - 5 pints/acre

#### **Method of application of control agent**

Spray on surface of foliage with appropriate surfactant

#### **Timing and sequence of control application**

Apply when plants are actively growing.

**Other control application specifications**

Monitor plant growth prior to treatment.

**Entity to apply control agent**

SCDNR-Wildlife and Freshwater Fisheries Division, Lake Management staff.

**Estimated cost of control operations**

\$578\*

**Potential sources of funding**

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

**Lancaster Reservoir  
(Lancaster County)****Problem plant species**

Water primrose, Alligatorweed

**Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

**Selected control method**

Renovate 3, Glyphosate

**Area to which control is to be applied**

8 acres in lake.

**Rate of control agent to be applied**

Renovate 3 - 0.50 - 0 gals/acre

Glyphosate - 6 - 5 pints/acre

**Method of application of control agent**

Spray on surface of foliage with appropriate surfactant

**Timing and sequence of control application**

Apply when plants are actively growing.

**Other control application specifications**

Monitor plant growth prior to treatment.

**Entity to apply control agent**

SCDNR-Wildlife and Freshwater Fisheries Division, Lake Management staff.

**Estimated cost of control operations**

\$539\*

**Potential sources of funding**

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

## **Sunrise Lake (Lancaster County)**

### **Problem plant species**

Pondweed

### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

### **Selected control method**

Glyphosate

### **Area to which control is to be applied**

15 acres in lake.

### **Rate of control agent to be applied**

Glyphosate - 6 - 5 pints/acre

### **Method of application of control agent**

Spray on surface of foliage with appropriate surfactant

### **Timing and sequence of control application**

Apply when plants are actively growing.

### **Other control application specifications**

Monitor plant growth prior to treatment.

### **Entity to apply control agent**

SCDNR-Wildlife and Freshwater Fisheries Division, Lake Management staff.

### **Estimated cost of control operations**

\$290\*

### **Potential sources of funding**

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

**Lake Ashwood  
(Lee County)**

**Problem plant species**

Waterlily

**Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

**Selected control method**

2,4-d BEE granular

**Area to which control is to be applied**

<5 acres of spotty coverage

**Rate of control agent to be applied**

200 pounds per acre

**Method of application of control agent**

Spray on surface of foliage with appropriate surfactant

**Timing and sequence of control application**

Apply when plants are actively growing.

**Other control application specifications**

Monitor plant growth prior to treatment.

**Entity to apply control agent**

SCDNR-Wildlife and Freshwater Fisheries Division, Lake Management staff.

**Estimated cost of control operations**

\$2,360\*

**Potential sources of funding**

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

**Lake Edgar Brown  
(Barnwell County)****Problem plant species**

Water primrose, Coontail

**Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

**Selected control method**

Glyphosate

**Area to which control is to be applied**

60 acres in lake.

**Rate of control agent to be applied**

Glyphosate - 6 - 5 pints/acre

**Method of application of control agent**

Spray on surface of foliage with appropriate surfactant

**Timing and sequence of control application**

Apply when plants are actively growing.

**Other control application specifications**

Monitor plant growth prior to treatment.

**Entity to apply control agent**

SCDNR-Wildlife and Freshwater Fisheries Division, Lake Management staff.

**Estimated cost of control operations**

\$1,158\*

**Potential sources of funding**

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

## Lake George Warren (Hampton County)

### **Problem plant species**

Water primrose, Cattails, Coontail

### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

### **Selected control method**

Glyphosate, Habitat

### **Area to which control is to be applied**

20 acres in lake.

### **Rate of control agent to be applied**

Glyphosate - 6 - 5 pints/acre

Habitat - 0.25 - 0.50 gals/ac

### **Method of application of control agent**

Spray on surface of foliage with appropriate surfactant

### **Timing and sequence of control application**

Apply when plants are actively growing.

### **Other control application specifications**

Monitor plant growth prior to treatment.

### **Entity to apply control agent**

SCDNR-Wildlife and Freshwater Fisheries Division, Lake Management staff.

### **Estimated cost of control operations**

\$1,112\*

### **Potential sources of funding**

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

## **Lake Thicketty (Cherokee County)**

### **Problem plant species**

Hydrilla

### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

### **Selected control method**

Hydrilla Triploid grass carp, chelated copper

### **Area to which control is to be applied**

5 acres in lake.

### **Rate of control agent to be applied**

Approximately 5 acres in priority areas such as, public access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas. If conditions warrant, release triploid grass carp in close proximity to areas of the lake with the greatest hydrilla growth

and use herbicide applications to provide immediate short-term control of localized growth in those areas. 20 fish per vegetated acre.

Chelated copper - up to 1 ppm Glyphosate- up to 1 gallon per acre.

### **Method of application of control agents**

Chelated copper- subsurface application by airboat.

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

### **Timing and sequence of control application**

All herbicides to be applied when plants are actively growing.

Triploid grass carp – If conditions warrant, triploid grass carp to be released as soon as possible.

### **Other control application specifications**

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time.

If available, all sterile grass carp will be a minimum of 12 inches in length. Sterile grass carp shipments will be certified by the SCDNR for sterility and checked for size and condition prior to stocking in the lake.

### **Entity to apply control agent**

Herbicide application – SCDNR Wildlife and Freshwater Fisheries Division, Lake Management staff and/or commercial applicator.

Triploid Grass Carp - SCDNR Wildlife and Freshwater Fisheries Division, Lake Management staff and/or a commercial supplier with supervision by the SCDNR.

### **Estimated cost of control operations**

\$700\*

### **Potential sources of funding**

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

## South Carolina Border Lakes

Approval for Lake Wylie was accomplished by SCDNR staff in conjunction with staff from North Carolina Natural Resource agencies, Duke Energy staff, and the Lake Wylie Marine Commission.

### Lake Wylie

(York County, SC; Gaston and Mecklenburg County, NC)

#### Problem plant species

Hydrilla

#### Management objective

Reduce hydrilla growth lake-wide and prevent the spread of hydrilla to other systems.

Achieve measurable reduction of hydrilla within two or three years and once hydrilla has been controlled, prevent it from reestablishing.

Control hydrilla by using a low enough density of triploid grass carp that potentially other forms of native vegetation can become established.

#### Selected control method

Triploid (sterile) grass carp used lake wide for long-term control.

Registered and properly applied herbicides should be used for initial suppression and by home owners for spot treatments.

#### Area to which control is to be applied

Triploid grass carp will be released from boat ramps near the greatest concentration of hydrilla.

#### Rate of control agent to be applied

Triploid grass carp will be stocked at a rate of 20 per vegetated acre of hydrilla (1,800) or one fish per every 8 surface acres, whichever is greater. Stockings will be incremental and yearly for at least 4 years. Should hydrilla be controlled before 4 years, token stockings will still be made in order to achieve at least four age classes in Lake Wylie. Method of application of control agent. Presently there is 90 acres of documented hydrilla to be controlled.

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

#### Method of application of control agents

Herbicide- subsurface application by airboat.

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

### **Timing and sequence of control application**

Herbicide applications - To be applied when plants are actively growing.

Triploid grass carp to be released as soon as possible in the spring of 2009 (March-May) and yearly at the same time for at least the next three years. RESULTS FROM GRASS CARP MAY NOT BE EVIDENT FOR TWO OR MORE YEARS. After hydrilla has been controlled, follow up stocking, currently estimated at maintaining triploid grass carp stocking densities of approximately 1 fish per every 8 surface acres of Lake Wylie will be continued using mortality estimates derived from the population and population models.

### **Other control application specifications**

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time.

Triploid grass carp will be a minimum of 12 inches total length. All shipments will be examined for condition and length specified in the contract with the vendor.

### **Estimated cost of control operations**

All work to be done in North Carolina Section of the lake.

### **Entity to apply control agent**

Herbicide application - Commercial applicator or Duke Power Company

Drawdown - Duke Power Company

### **Potential sources of funding**

Duke Power Company 100% - All control work at present time is in North Carolina.

### **Long term management strategy**

- a) Manage hydrilla's potential adverse impacts to the Lake Wylie ecosystem using primarily triploid grass carp after initial suppression using approved herbicides.
- b) Maintain or enhance native aquatic vegetation by maintaining the lowest possible stocking rates of triploid grass carp, especially once major stands of hydrilla have been controlled.
- c) Seek to prevent further introduction and distribution of problem aquatic species through public education and enforcement of existing laws and regulations.
- d) Periodically revise management plans and strategy as new environmental data becomes available.
- e) Plan for long-term control of hydrilla, once control has been achieved, by maintaining very low densities of triploid grass carp. Stockings will be determined from mortality estimates generated from triploid grass carp collected on Lake Wylie and the use of age-structure population models developed for fisheries.

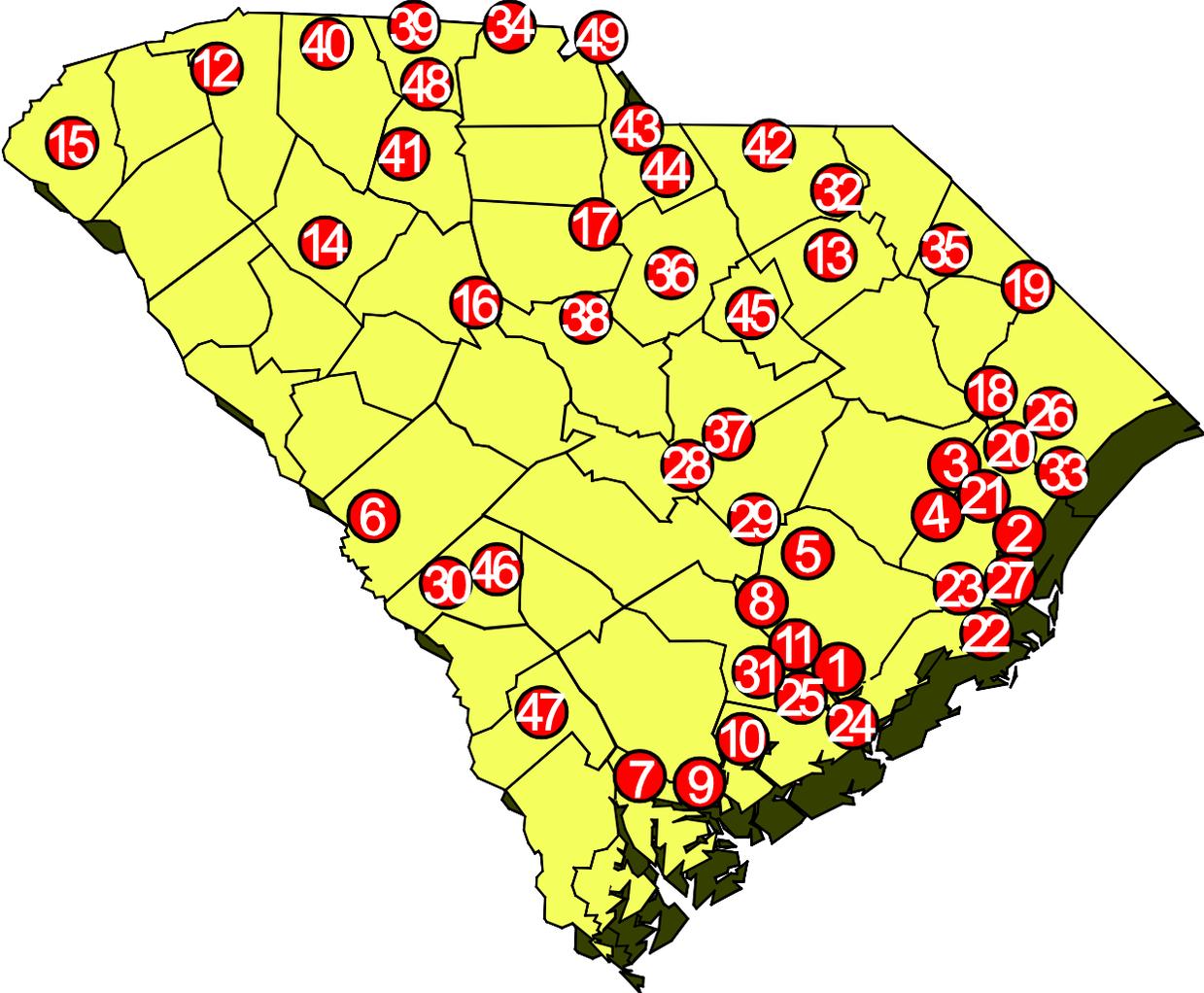
## Summary of Planned Management Operation Expenditures For 2009

	Water body	Total Cost	Local	State	Other	Contributor
<b>SC</b>	<b>Public Waters:</b>					
1	Back River Reservoir	\$67,571	\$33,785	\$33,785	\$0	SCE&G, CPW
2	Baruch Institute	\$10,794	\$5,397	\$5,397	\$0	Baruch Institute
3	Black Mingo Creek	\$1,819	\$910	\$910	\$0	Georgetown Co.
4	Black River	\$1,819	\$910	\$910	\$0	Georgetown Co.
5	Bonneau Ferry	\$8,094	\$0	\$8,094	\$0	SCDNR
6	Boyd Pond	\$5,465	\$2,732	\$2,732	\$0	Aiken Co.
7	Combahee River (Borrow Pit)	\$622	\$311	\$311	\$0	Colleton Co.
8	Cooper River	\$47,766	\$23,883	\$23,883	\$0	Berkeley Co.
9	Donnelly/Bear Island WMA	\$6,236	\$3,118	\$3,118	\$0	SCDNR
10	Dungannon WMA	\$2,537	\$1,269	\$1,269	\$0	SCDNR
11	Goose Creek Reservoir	\$43,019	\$21,509	\$21,509	\$0	Charleston CPW
12	Lake Cunningham	\$7,612	\$3,806	\$3,806	\$0	Greer CPW.
13	Lake Darpo	\$2,339	\$1,170	\$1,170	\$0	Darlington Co.
14	Lake Greenwood	\$80,720	\$40,720	\$40,000	\$0	Greenwood Co.
15	Lake Keowee	\$3,553	\$1,777	\$1,777	\$0	Duke Power
16	Lake Murray	\$0	\$0	\$0	\$0	SCE&G, Lex. Co., Rich. Co.
17	Lake Wateree	\$3,258	\$1,629	\$1,629	\$0	Duke Power
18	Little Pee Dee River	\$5,870	\$2,935	\$2,935	\$0	Horry Co.
19	Lumber River	\$1,535	\$768	\$768	\$0	Horry Co.
20	Pee Dee River	\$13,737	\$6,868	\$6,868	\$0	Georgetown Co.
21	Samworth WMA	\$12,238	\$6,119	\$6,119	\$0	Samworth WMA
22	Santee Coastal Reserve	\$29,125	\$14,563	\$14,563	\$0	Santee Coastal Reserve
23	Santee Delta WMA	\$4,369	\$2,184	\$2,184	\$0	SCDNR
24	USCOE Charleston Harbor	\$37,134	\$0	\$0	\$37,134	Charleston COE
25	US Naval Wpns. Station	\$3,641	\$1,820	\$1,821	\$0	US Navy
26	Waccamaw River	\$9,131	\$4,566	\$4,565	\$0	Horry Co., Georgetown Co.
27	Yawkey	\$4,906	\$2,453	\$2,453	\$0	Yawkey Foundation
	<b>Santee Cooper Lakes</b>					
28	Lake Marion*	\$287,800	\$247,800	\$40,000	\$0	Santee Cooper
29	Lake Moultrie*	\$30,335	\$15,167	\$15,168	\$0	Santee Cooper
	<b>State Park Lakes</b>					

30	Barnwell SP	\$665	\$333	\$333	\$0	SCPRT
31	Charlestown Landing SP	\$1,162	\$581	\$581	\$0	SCPRT
32	H Cooper Black (Rec. Area)	\$444	\$222	\$222	\$0	SCPRT
33	Huntington Beach SP	\$1,658	\$829	\$829	\$0	SCPRT
34	Kings Mt. Lk. Crawford SP	\$1,172	\$586	\$586	\$0	SCPRT
35	Little Pee Dee SP	\$2,218	\$1,109	\$1,109	\$0	SCPRT
36	NR Goodale SP	\$444	\$222	\$222	\$0	SCPRT
37	Santee (swimming lake) SP	\$2,410	\$1,205	\$1,205	\$0	SCPRT
38	Sesquicentennial SP	\$1,109	\$554	\$554	\$0	SCPRT
<b>SCDNR Lakes</b>						
39	Lake Cherokee	\$962	\$0	\$0	\$962	SCDNR
40	Lake Edwin Johnson	\$2,939	\$0	\$0	\$2,939	SCDNR
41	Jonesville Reservoir	\$1,155	\$0	\$0	\$1,155	SCDNR
42	Mountain Lakes	\$578	\$0	\$0	\$578	SCDNR
43	Lancaster Reservoir	\$539	\$0	\$0	\$539	SCDNR
44	Sunrise Lake	\$290	\$0	\$0	\$290	SCDNR
45	Lake Ashwood	\$2,360	\$0	\$0	\$2,360	SCDNR
46	Lake Edgar Brown	\$1,158	\$0	\$0	\$1,158	SCDNR
47	Lake George Warren	\$1,112	\$0	\$0	\$1,112	SCDNR
48	Lake Thicketty	\$700	\$0	\$0	\$700	SCDNR
<b>SC Border Lakes</b>						
49	Lake Wylie	\$0	\$0	\$0	\$0	Duke Energy
<b>Totals:</b>		<b>\$756,117</b>	<b>\$453,808</b>	<b>\$253,382</b>	<b>\$48,927</b>	

NOTE: Planned expenditures are based on anticipated aquatic plant problems. The extent of proposed management operations will be modified depending on actual aquatic plant growth and funding availability in 2009 (Percentage of match subject to change based on availability of Federal and State funding.) \* Control operations on Lakes Marion and Moultrie may receive federal funds from the Corps of Engineers St. Stephen Plant if control activities are directly related to maintaining operation of the St. Stephen Hydropower Facility. Those funds should be used whenever possible instead of APC cost-share funds from the Charleston District.

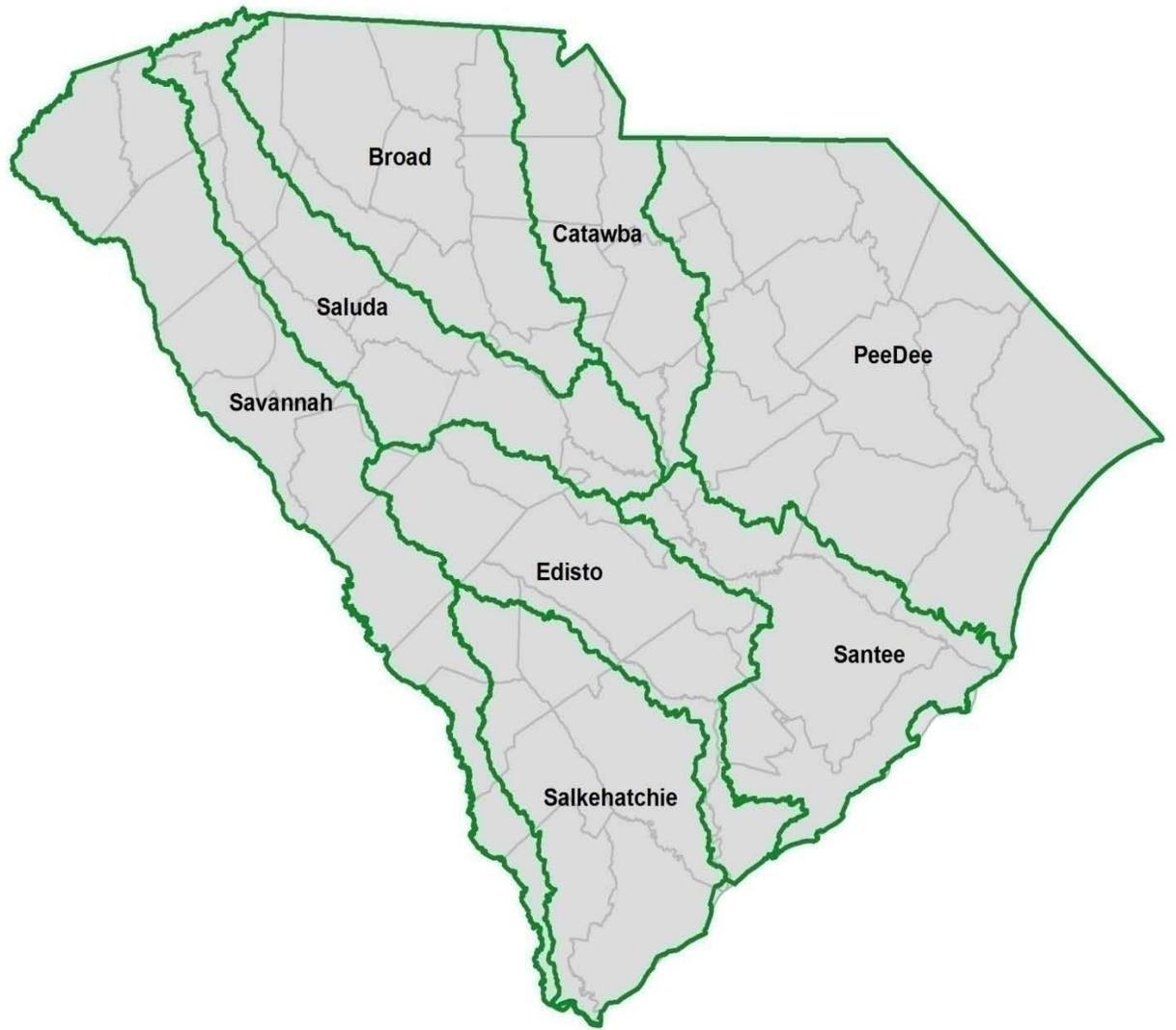
Location of 2009 Management Sites



# Appendices

## **APPENDIX A**

### **Major River Basins in South Carolina**



## **APPENDIX B**

### **Enabling Legislation**

South Carolina Code of Laws Section 49-6-10/40

Title 49 – Waters, Water Resources and Drainage

CHAPTER AQUATIC PLANT MANAGEMENT

SECTION 49-6- Purpose; administering agency.

There is hereby created the South Carolina Aquatic Plant Management Program for the purpose of preventing, identifying, investigating, managing, and monitoring aquatic plant problems in public waters of South Carolina. The program will coordinate the receipt and distribution of available federal, state, and local funds for aquatic plant management activities and research in public waters.

The Department of Natural Resources (department) is designated as the state agency to administer the Aquatic Plant Management Program and to apply for and receive grants and loans from the federal government or such other public and private sources as may be available for the Aquatic Plant Management Program and to coordinate the expenditure of such funds.

SECTION 49-6-20. Aquatic Plant Management Trust Fund.

There is created the South Carolina Aquatic Plant Management Trust Fund which must be kept separate from other funds of the State. The fund must be administered by the department for the purpose of receiving and expending funds for the prevention, management, and research of aquatic plant problems in public waters of South Carolina. Unexpended balances, including interest derived from the fund, must be carried forward each year and used for the purposes specified above. The fund shall be subject to annual audit by the Office of the State Auditor.

The fund is eligible to receive appropriations of state general funds, federal funds, local government funds, and funds from private entities including donations, grants, loans, gifts, bond issues, receipts, securities, and other monetary instruments of value. All reimbursements for monies expended from this fund must be deposited in this fund.

SECTION 49-6-30. Aquatic Plant Management Council; membership; duties.

There is hereby established the South Carolina Aquatic Plant Management Council, hereinafter referred to as the council, which shall be composed of ten members as follows:

The council shall include one representative from each of the following agencies, to be appointed by the chief executive officer of each agency:

- (a) Water Resources Division of the Department of Natural Resources;
- (b) South Carolina Department of Health and Environmental Control;
- (c) Wildlife and Freshwater Fish Division of the Department of Natural Resources;
- (d) South Carolina Department of Agriculture;

- (e) Coastal Division of the Department of Health and Environmental Control;
- (f) South Carolina Public Service Authority;
- (g) Land Resources and Conservation Districts Division of the Department of Natural Resources;
- (h) South Carolina Department of Parks, Recreation and Tourism;
- (i) Clemson University, Department of Fertilizer and Pesticide Control.

The council shall include one representative from the Governor's Office, to be appointed by the Governor.

The representative of the Water Resources Division of the Department of Natural Resources shall serve as chairman of the council and shall be a voting member of the council.

The council shall provide interagency coordination and serve as the principal advisory body to the department on all aspects of aquatic plant management and research. The council shall establish management policies, approve all management plans, and advise the department on research priorities.

#### SECTION 49-6-40. Aquatic Plant Management Plan.

The department, with advice and assistance from the council, shall develop an Aquatic Plant Management Plan for the State of South Carolina. The plan shall describe the procedures for problem site identification and analysis, selection of control methods, operational program development, and implementation of operational strategies. The plan shall also identify problem areas, prescribe management practices, and set management priorities. The plan shall be updated and amended at appropriate intervals as necessary; provided, however, problem site identification and allocation of funding shall be conducted annually. In addition, the department shall establish procedures for public input into the plan and its amendments and priorities. The public review procedures shall be an integral part of the plan development process. When deemed appropriate, the department may seek the advice and counsel of persons and organizations from the private, public, or academic sectors.

The council shall review and approve all plans and amendments. Approval shall consist of a two-thirds vote of the members present. The department shall have final approval authority over those sections which do not receive two-thirds approval of the council.

Some of the Specific State Laws which pertain to Illegal, Noxious, or Nuisance Species:

Title 46, Chapter 9 - State Crop Pest Act

The State Crop Pest Commission is authorized by law (Section 46-9-40) to promulgate and enforce reasonable regulations to eradicate or prevent the introduction, spread or dissemination of plant pests. Plant pests are by definition (Section 46-9-15(5)) any living state of insects, mites, nematodes,

slugs, animals, protozoa, snails or other invertebrate animals, bacteria, weeds, fungi, other parasitic plants...which directly or indirectly may injure or cause disease or damage in plants...and which may be a serious agricultural threat to the State, as determined by the Director.

The State Crop Pest Commission is responsible for control of plant pests which constitute a threat to production agriculture. In so doing, the Commission is the primary contact point for cooperation with the Animal and Plant Health Inspection Service (APHIS), U. S. Department of Agriculture.

The Commission has designated certain organisms as plant pests. These organisms are already designated as noxious weeds by state and/or federal authorities or are under domestic federal quarantine. Once a plant pest has been designated, the Commission has the authority to impose control measures, up to and including, quarantine of the premises. However, the Director, as the Commission's designee, retains the discretion to determine that a plant pest has become so widespread that further control measures are not warranted.

#### Title 46, Chapter 23 - South Carolina Noxious Weed Act

Provides far reaching powers to seize, quarantine, treat, destroy, apply other remedial measures, to export, return to shipping point, or otherwise dispose of in such a manner as (it) deems appropriate, any noxious weed or any product or article of any character whatsoever or any means of conveyance which (it) has reason to believe contains or is contaminated with any noxious weed, offered for movement, moving, or has moved into or through the state or intrastate. To further deter persons from spreading nuisance aquatic weeds the law includes fines not exceeding \$500 and/or imprisonment not exceeding one year.

SECTION 50-13-1415 - Importation, possession, or placing water hyacinth and hydrilla in waters of the state.

No person shall possess, sell, offer for sale, import, bring, or cause to be brought or imported into this State or release or place into any waters of this State any of the following plants:

(1) Water Hyacinth

(2) Hydrilla

Provided, however, that the department may issue special import permits to qualified persons for research purposes only.

The department shall prescribe the methods, control, and restrictions which are to be adhered to by any person or his agent to whom a special permit under the provisions of this section is issued. The department is authorized to promulgate such regulations as may be necessary to effectuate the provisions of this section and the department, by regulation, is specifically authorized to prohibit additional species of plants from being imported, possessed, or sold in this State when, in the discretion of the department, such species of plants are potentially dangerous.

SECTION 50-13-1630. Importing, possessing or selling certain fish unlawful; special permits for research; Department shall issue rules and regulations.

(A) No person may possess, sell, offer for sale, import, bring or cause to be brought or imported into this State or release into the waters of this State the following fish:

(1) carnero or candiru catfish (*Vandellia cirrhosa*);

(2) freshwater electric eel (*Electrophorus electricus*);

(3) white amur or grass carp (*Ctenopharyngodon idella*);

(4) walking catfish or a member of the clariidae family (Clarias, Heteropneustea, Gymnallabes, Channallabes, or Heterobranchus genera);

(5) piranha (all members of Serrasalmus, Rooseveltiella, and Pygocentrus genera);

(6) stickleback;

(7) Mexican banded tetra;

(8) sea lamprey;

(9) rudd (*Scardinius erythrophthalmus*-Linnaeus).

(B) The department may issue special import permits to qualified persons for research and education only.

(C) The department may issue special permits for the stocking of non-reproducing white amur or grass carp hybrids in the waters of this State.

(D) It is unlawful to take grass carp from waters stocked as permitted by this section. Grass carp caught must be returned to the water from which it was taken immediately.

(E) The department must prescribe the qualifications, methods, controls, and restrictions required of a person or his agent to whom a special permit is issued. The department must condition all permits issued under this section to safeguard public safety and welfare and prevent the introduction into the wild or release of nonnative species of fish or other organisms into the waters of this State. The department may promulgate regulations necessary to effectuate this section and specifically to prohibit additional species of fish from being imported, possessed, or sold in this State when the department determines the species of fish are potentially dangerous.

**APPENDIX C**

**Aquatic Plant Problem Identification Form**

## Aquatic Plant Problem Site Identification Form

Name and location of affected water body

---

GPS Location (LAT/LONG or UTM. specify projection)

---

Public or private water

---

Name of problem plant (if known)

---

Does the plant grow above or below the surface of the water?

---

Approximate area of water covered by the problem plant

---

Type of water use(s) affected by the plant

---

Length of time problem has existed

---

Plant control methods that have been used

---

Contact for additional information: \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_

Please Return To: Chris Page

S.C. Department of Natural Resources

2730 Fish Hatchery Road, West Columbia, South Carolina 29170

(803) 755-2836

\*\* Please include a sample of the plant if possible. Wrap the plant in a moist towel and place in a "baggie". The sample should include flowers, if visible, along with leaf structure and stem.

## **APPENDIX D**

### **Aquatic Plant Control Agents**

## Aquatic Plant Control Agents

Listed below are the major aquatic plant control agents which are currently available for use in South Carolina. While the list is not all inclusive, it does contain those agents considered most useful for aquatic plant management. Costs for the agents are approximations and will vary somewhat depending on the source and amount purchased. Application costs are approximations of commercial applicator rates.

### I. Chemical Control

#### Diquat (Reward)

##### Target Plants

Submersed species - Bladderwort, coontail, elodea, naiad, pondweeds, watermilfoil, and hydrilla.

Floating species - Pennywort, Salvinia, water hyacinth, water lettuce, and duckweed.

##### Application Rate

Submersed species - One to two gallons per surface acre. Floating species - One half to one gallon per surface acre, depending on target species.

Cost -Diquat costs approximately \$99 per gallon. Assuming an application rate of two gallons per acre and an application cost of \$41 per acre, the total cost would be \$239 per acre per application for submersed species. The treatment cost for floating species at one-half gallon per acre rate would be \$90 per acre.

Use Considerations -Diquat is not toxic to fish or wildlife at normal use concentrations. It is non-volatile and nonflammable, but can cause irritation to eyes and skin upon contact. Its effectiveness is greatly reduced at temperatures below 50-60°F, by overcast conditions, and by turbid waters.

Water Use Restrictions - Water treated with Diquat cannot be used for drinking for up to 3 days, livestock consumption for one day, irrigation of food crops for 5 days, and irrigation of turf and ornamentals for up to 3 days depending on application rate or until approved analysis indicates that diquat ion concentrations are less than 0.02 ppm. There are no fishing or swimming restrictions. Do not apply this product within 1600 feet upstream of an operating water intake in flowing water bodies (rivers, streams, canals) or within 400 feet of an operating water intake in standing water bodies (lakes, reservoirs). To make applications within these restricted areas, the intake must be turned off for the time periods specified on the Federal label for the appropriate use category (Drinking, Livestock consumption, Irrigation) or until the treated area contains less than 0.02 ppm of diquat dibromide.

B,2,4-D (Aqua-Kleen, Navigate, Hardball, Sinkerball)

### Target Plants

Emergent species - Broadleaf species such as water primrose, waterlily, cowlily, watershield, smartweed, pondweeds, and floating heart. Submersed species - Watermilfoil, bladderwort, and coontail. Floating species - Water hyacinth.

### Application Rate

Granular form (2,4-D BEE) - 150 to 200 pounds per acre depending on target species. Liquid form - (2,4-D DMA) - 5 gallons per acre.

### Cost

The granular form of 2,4-D costs about \$36 per pound. Assuming an application rate of 200 pounds per acre and an application cost of \$47 per acre, the total cost would be \$519 per application. The liquid form of 2,4-D costs approximately \$31 per gallon. Assuming an application rate of 5 gallons per acre and an application cost of \$41 per acre, the total cost would be \$196 per application.

Use Considerations - The recommended formulations of 2,4-D are not toxic to fish or wildlife at normal use concentrations. This chemical is nonflammable and noncorrosive.

Water use Restrictions - Do not apply to waters used for irrigation, agricultural sprays, watering dairy animals, or domestic water supplies.

Chelated Copper (Cutrine Plus, Clearigate, Komeen, K-TEA, Nautique, Captain)

### Target Plants

Algae - Cutrine Plus, K-TEA, Captain

Submersed species (Hydrilla, Brazilian elodea, pondweed and southern naiad) - Komeen, Nautique, Cutrine Plus, Clearigate, and Captain

### Application Rate

Algae - Treatment concentration of 0.2-0.5 parts per million of copper. Submersed species - 0 part per million of copper (12-16 gallons per acre) or mix two gallons of copper complex and two gallons of Diquat per acre.

Cost - Copper products cost about \$17 per gallon. Assuming an application rate of 16 gallons per acre and an application cost of \$41 per acre, the total cost would be \$313 per acre.

Use Considerations - Copper may be toxic to fish and aquatic invertebrates at recommended application rates, especially in soft water. Copper-based product should be carefully applied and monitored to minimize the risk of fish kills.

Water Use Restrictions - Copper complexes may be used in domestic and irrigation water supplies without water use restrictions.

D. Endothall - (Aquathol, Aquathol K, Aquathol Super K granular, Hydrothol 191 granular and liquid)

#### Target Plants

Aquathol products are effective for submersed species such as naiads, bladderwort, coontail, watermilfoil, pondweed, hydrilla, and cabomba

Hydrothol 191 is effective on the species listed above as well as filamentous and macrophytic algae.

#### Application Rate

##### Aquathol

Liquid form (Aquathol K) - three gallons or more per acre depending on the target species. Granular form - Aquathol: 54-323 pounds per acre depending on water depth and the target species.

Aquathol Super K: 22-66 pounds per acre depending on the water depth and the target species.

##### Hydrothol 191

Heavy Infestations - Evenly spread 160 - 270 pounds per acre foot of water (0 - 0 ppm) applied evenly. Moderate or light infestations - Use 55 - 110 pounds per acre foot (0 - 0 ppm) applied evenly.

#### Cost

##### Aquathol

Aquathol K costs approximately \$57 per gallon. Assuming an application rate of 5 gallons per acre and an application cost of \$41 per acre, the total cost would be \$326 per acre. Aquathol Super K costs about \$15 per pound at an application rate of 30 pounds per acre and an application cost of \$47 per acre, the total cost would be \$510 per acre.

##### Hydrothol 191

Hydrothol 191 costs approximately \$64 per gallon. Assuming an application rate of 7 gallons per acre and an application cost of \$41, the total cost would be \$492 per acre.

Hydrothol 191 granular costs approximately \$78 per pound. Assuming an application rate of 240 pounds per acre and an application cost of \$47, the total cost would be \$714 per acre.

Use Considerations - Concentrated endothall formulations are toxic to man if ingested or absorbed through the skin. They are also irritating to the skin and eyes. Avoid contact with or drift to other crops or plants as injury may result. Generally not toxic to fish at normal use concentrations, however, fish may be killed by dosages of Hydrothol 191 in excess of 0.3 ppm.

Water Use Restrictions - Water treated with endothall cannot be used for watering livestock, preparing agricultural sprays for food crops, for irrigation or domestic purposes for 7 to 25 days after treatment (depending on treatment concentration) or until such time that the water does not contain more than 0.2 ppm of endothall. Do not use fish from treated areas for feed or food for three days after treatment.

#### E. Glyphosate (Rodeo, Aquastar, Touchdown Pro)

Target Plants - Emergent broadleaf plants and grasses such as alligatorweed, water primrose, smartweed, and Phragmites.

Application Rate - Up to 7 1/2 pints per acre, the specific rate depending on the target species.

Cost - Glyphosate products range in price from \$21-\$39 per gallon. At an application rate of 5 pints per acre and an application cost of \$41 per acre, the total would range from \$63-\$78 per acre per application.

Use Considerations - Glyphosate is not toxic to mammals, birds or fish at recommended use concentrations. Glyphosate products with aquatic labels can be used in and around aquatic sites, including all bodies of fresh and brackish water which may be flowing or nonflowing.

Water Use Restrictions - Do not apply within 0.5 miles upstream of potable water intakes unless water intake is shut off for 48 hours. There are no restrictions on water use for irrigation or recreation after treatment.

#### F. Fluridone (Sonar, Avast)

Target Plants - Primarily submersed plants, such as hydrilla, Brazilian elodea, watermilfoil, pondweeds, duckweeds and naiads; also effective on lilies and some grasses.

Application Rate Liquid form (Sonar AS, Avast) - 1-4 pints per acre depending on water depth. Pellet forms (Sonar PR, Sonar SRP, Avast SRG) - 15 to 80 pounds per acre depending on water depth.

Cost - The liquid formulation ranges from \$1468-\$1650 per gallon. Assuming an application rate of 5 pints per acre (2 pounds active ingredient per acre) and an application cost of \$40 per acre, the total cost would be \$349 per acre per application. The pellet formulations range in price from \$200-\$200 per pound. Assuming an application rate of 20 pounds per acre (2 pounds active ingredient per acre) and an application cost of \$47 per acre, the total cost would be \$567 per acre per application.

Use Considerations - In large lakes and reservoirs fluridone should be applied to areas greater than five acres. This herbicide requires a long contact time and is not effective in sites with significant water movement or rapid dilution. Fluridone is slow acting and may require 30 to 90 days to achieve desired control under optimal conditions. Unlike other aquatic herbicides, fluridone has proven effective in inhibiting viable hydrilla tuber production.

Water Use Restrictions - Do not apply within 1/4 mile of a functioning potable water intake unless concentrations are less than 20 ppm. Water treated with fluridone cannot be used for irrigation for 7-30 days depending on target crop.

#### G. Imazapyr (Habitat)

Target Plants - Phragmites, Alligatorweed, Water primrose, and Cutgrass.

Application Rate - 1 to 6 pints per acre depending on target species.

Cost - Habitat (Imazapyr) costs \$245 per gallon. Assuming the application rate of 16 oz. per acre and an application cost of \$41 per acre, the total cost would be \$78 per acre.

Use Considerations - Applications to public waters can only be made by federal, state, or local agencies or those applicators which are licensed or certified as aquatic pest control applicators and are authorized by state or local agencies. Do not use in close proximity to hardwoods.

Water Use Restrictions - Do not apply within 1/2 mile of potable water intakes. For applications within 1/2 mile of a potable water intake, the intake must be turned off for a minimum of 48 hours. Do not apply within 1 mile of active irrigation intakes on still or slow moving waters. Irrigation water usage may be continued 120 days after application or when Habitat (Imazapyr) residue levels are determined by laboratory analysis to be 0 ppb or less.

Aerial Applications may only be made by helicopter.

#### H. Imazamox (Clearcast)

Target Plants - Phragmites, Alligatorweed, Water primrose, and Cutgrass.

Application Rate - 1 to 6 pints per acre depending on target species.

Cost - Clearcast (Imazamox) costs \$175 per gallon. Assuming the application rate of 16 oz. per acre and an application cost of \$41 per acre, the total cost would be \$63 per acre.

Use Considerations - Applications to public waters can only be made by federal, state, or local agencies or those applicators which are licensed or certified as aquatic pest control applicators and are authorized by state or local agencies. Can be used in close proximity to hardwoods

Water Use Restrictions - Do not apply within 1/2 mile of potable water intakes. For applications within 1/2 mile of a potable water intake, the intake must be turned off for a minimum of 48 hours. Do not apply within 1 mile of active irrigation intakes on still or slow moving waters. Irrigation water usage may be continued 120 days after application or when Habitat (Imazapyr) residue levels are determined by laboratory analysis to be 0 ppb or less.

Aerial Applications may only be made by helicopter.

#### I. Triclopyr (Renovate 3, Tahoe)

Target Plants - Alligatorweed, Eurasian watermilfoil, water hyacinth, parrotfeather, and water primrose.

Application Rate - 2-8 qts. per acre depending on target species.

Cost - Triclopyr products cost \$96 per gallon. Assuming the application rate of 2 qts per acre and an application cost of \$41 per acre, the total cost would be \$89 per acre.

Use Considerations - Triclopyr is not toxic to fish or wildlife at normal use concentrations. It can cause severe irritation to eyes and skin upon contact. It is suggested that it is used in a manner to reduce the possibility of drift. The proper personal protective equipment should be used as prescribed by the Federal label.

Water Use Restrictions - For floating and emergent applications do not apply within 200 feet of operating potable water intakes when using 4 - 8 qts per acre. There are no setback restrictions for potable water intakes when 2 qts. per acre or less is applied to emergent vegetation. To make applications within these restricted areas, follow the label directions. There are no restrictions on the use of treated water for recreational purposes or for livestock consumption.

#### J. Carfentrazone (Stingray)

Target Plants

Submersed species – Eurasian water milfoil, Floating species – Water lettuce, water hyacinth, *Salvinia minima*, *S. molesta*, Azolla, duckweed, alligatorweed, water primrose

Application Rates

Submersed species – Eurasian water milfoil 2 ounces per acre. (Best when applied with liquid 2, 4-D)

Floating species – 7 – 15 ounces per acre

Cost – Carfentrazone costs approximately \$6 per ounce (\$760 per gallon). Assuming an application rate of 2 ounces per acre and an application cost of \$41 per acre total cost would be \$53 per acre for submersed species. Assuming an application rate of 15 ounces per acre, the total cost would be \$122 per acre for floating species.

Use considerations – Carfentrazone is moderately toxic to fish. It is non-volatile and non-flammable. It can cause moderate eye irritation and has low acute toxicity.

Water Use Restrictions - Water treated with carfentrazone cannot be used for drinking or for consumption by livestock for up to 1 day. It should not be used in tank mixes or used for irrigation of food crops, turf, or ornamentals for up to 14 days. There are no recreation, fishing, or swimming restrictions. Applications within ¼ mile (1320 feet) of a potable water intake in flowing or standing water can only be made if the intake will be turned off prior to application and left off for a minimum of 24 hours. The 24 hour minimum can only be reduced if the concentration of

carfentrazone-glycol is shown to be below 0.2ppm through testing carried out by a FMC approved lab.

#### K. Penoxsulam (Galleon SC)

##### Target Plants

Submersed species – Hydrilla, Cabomba, Egeria, Eurasian watermilfoil

Floating species – Floating species – Water hyacinth, Water lettuce, Water fern, Duckweed, Frog's bit, Mosquito fern

##### Application Rates

0.174 fl oz per acre foot to achieve minimum effective concentration of 25 – 75 ppb.

Floating species – 2- 6 fl oz per acre as foliar application.

Cost – Penoxsulam costs approximately \$1650 per gallon. Assuming an application rate of 11 fl oz per acre and an application cost of \$41 per acre, total cost would be \$183 per acre for submersed plants. Assuming an application rate of 6 fl oz per acre, and an application cost of \$41 per acre, total cost would be \$113 per acre for emergent plants.

Use considerations – Penoxsulam has no potable water restrictions or irrigation restrictions except for irrigation of food crops. It must have prolonged contact times similar to flouridone (>21 days).

Water Use Restrictions - Food crop irrigation waters cannot be used if penoxsulam concentrations are above 1ppb

#### II. Biological Control

##### Alligatorweed Flea Beetle (*Agasicles hygrophila*)

Target Plant - Alligatorweed

Stocking Rate - 600-1,000 per acre.

Cost - The U.S. Army Corps of Engineers office in Palatka, Florida will provide lots of 6,000 flea beetles for the cost of shipping which is about \$50 per shipment. Flea beetles may also be obtained from the U.S. Department of Agriculture.

Use Considerations - Flea beetles feed only on alligatorweed and pose no threat to desirable plant species. They produce no adverse impact on the aquatic environment. As with all biological control agents, flea beetles may not remain in the area where stocked but may migrate to other areas of alligatorweed infestation. These insects are not able to survive severe winters and may require occasional restocking. The effectiveness of these insects may be enhanced by use with an aquatic herbicide such as 2, 4-D, or Rodeo.

Alligatorweed Stem Borer Moth (*Vogtia malloi*)

Target Plant - Alligatorweed

Cost - Approximately the same as for flea beetle.

Use Considerations - Same as for flea beetle.

Alligatorweed Thrip (*Amynothrips andersonii*) - This insect feeds on alligatorweed and has been stocked in South Carolina. It has failed to become established in the State and is considered less desirable than flea beetles or stem borers for control of alligatorweed.

D. Triploid White Amur or grass carp (*Ctenopharygodon idella*)

Target Plant - Primarily submersed plants including Brazilian elodea, hydrilla, bladderwort, coontail, naiads, pondweeds.

Cost - Triploid white amur cost \$4 to \$7 each. At a stocking rate of 15 to 25 fish per vegetated acre, the total cost could range from \$60 to \$175 per acre.

Use Considerations - Only the triploid (sterile) white amur may be stocked in South Carolina for aquatic weed control. Introduction and stocking of this fish is regulated by the S.C. Department of Natural Resources and requires a permit. Escapement over some dams may occur during high flow periods. Use of barriers in some lakes should prevent fish loss. While grass carp are effective on a wide variety of submersed plants, they generally do not provide effective control of watermilfoil species. Plants should be carefully identified prior to stocking to ensure proper stocking rates and potential efficacy.

E. Tilapia (*Tilapia* sp.) - Several species of this herbivorous fish have been used to control filamentous algae and submersed macrophytes. Tilapia cannot overwinter in South Carolina. Introduction of fish is regulated by the S.C. Department of Natural Resources.

### III. Mechanical Control

Harvesters, Cutters, Dredges and Draglines

Target Plants - All species

Cost - Harvesters range in cost from \$5,000 to over \$150,000 for the initial investment. Operating cost range from \$300 to \$700 per acre.

Use Consideration - Harvesters can be used in irrigation and drinking water supplies without water use restrictions. They may actually spread some plants such as Brazilian elodea and hydrilla by dispersing plant fragments which form new colonies. Harvesting requires the availability of a land disposal site for harvested plants. These devices cannot be used on water bodies which have debris and obstructions which interfere with operation. Harvesters are slow, with a maximum coverage of about five acres per day.

## Fiberglass Bottom Screens

Target Plants - All species which root in the bottom.

Cost \$10,000 per acre.

Use Considerations - Bottom screens may be detrimental to bottom-dwelling aquatic organisms. Due to high cost, use is usually restricted to beaches and other swimming areas where a relatively small area of control is required.

## IV. Environmental Alterations

Water Level Manipulation - Some species of aquatic plants can be controlled by a periodic raising or lowering of water level. Shoreline grasses, cattails, and Phragmites can be controlled, to some extent, by maintaining higher than normal water levels during the plant growing season. Periodic lowering of water and drying of the bottom can reduce abundance of a number of submersed and emersed species. Disadvantages are that water level fluctuation can adversely affect water uses such as recreation, hydroelectric power production, wildlife protection, and others. Also, some plant species may actually be favored by water level variations. Many factors must be considered before using this method for aquatic plant control.

Reduction in Sedimentation and Nutrient Loading - Sedimentation decreases depth of the water body and increased the area where aquatic plants can grow. Nutrient enrichment resulting from man's activities usually does not create aquatic plant problems, but does contribute to existing problems. Reduction in these two environmental factors can assist in aquatic plant management, but is not a sufficient control method by itself. The mechanism for control of these factors is through implementation of Best Management Practices for Control of Non-Point Source Pollution developed by the S.C. Department of Health and Environmental Control, and through the wastewater discharge permitting program (NPDES) also administered by the S.C. Department of Health and Environmental Control.

## **APPENDIX E**

### **SCDNR and Santee Cooper**

### **Aquatic Plant and Habitat Management Goals for the Santee Cooper Lakes**

## S.C. Department of Natural Resources and Santee Cooper Aquatic Plant and Habitat Management Goals for the Santee Cooper Lakes

Santee Cooper (S-C) and the S.C. Department of Natural Resources (DNR) recognize the Santee Cooper Lakes as a significant natural resource of the State. In order to provide balanced benefits to natural resources and the multiple uses of the lakes, the DNR and S-C (the parties) agree to cooperate in the management of aquatic vegetation and the habitat that it provides. The parties' goal is to maintain 10 % of the lakes' surface area as beneficial vegetated habitat for waterfowl, wildlife, fish and other aquatic organisms. In order to achieve this goal, the parties agree to the following:

The aquatic plant management goal for the Santee Cooper Lakes is to achieve a diverse assemblage of native aquatic vegetation in 10% of the total surface area of the lake and to effectively control non-native invasive species. The aquatic plant coverage should include a combination of submersed, floating leaf, and emergent plant species that provide habitat and food to game and non-game fish and wildlife species. At least 75% of the vegetation should be composed of species that are beneficial to waterfowl. This vegetation should be distributed throughout the lake system. However, localized control using chemical or mechanical methods may be necessary in areas where vegetation interferes with hydroelectric power production or other legitimate lake uses regardless of plant coverage and distribution.

### Monitoring

**Aquatic Plants:** S-C will annually monitor the vegetative community and extent of coverage. This monitoring may include aerial photography, visual surveys, hydro-acoustic transects and other appropriate measures - as deemed necessary by the parties in the annual work plan - to map the plant species and coverage. An annual report of the monitoring results will be completed at the end of each growing season and provided to the parties prior to preparation of the following year's work plan.

**Fish and Wildlife:** The DNR and Santee Cooper will cooperate in monitoring the health of the fishery and in conducting enhanced monitoring of waterfowl populations. The waterfowl population monitoring will consist of aerial waterfowl censuses. The census will be conducted 10 times each winter. The DNR will provide personnel and prepare an annual report to be distributed to both agencies. S-C will provide the flight time, approximately 30 hours each year.

Sterile grass carp will continue to be a major component of the long-term management strategy in controlling hydrilla. The DNR and S-C will meet at least annually to review the monitoring data and to develop recommendations for maintenance stocking levels and other control strategies. These recommendations will be jointly presented to the Aquatic Plant Management Council for consideration. The implementation of these recommendations will be subject to approval by the Council.

Aquatic vegetation will not be controlled in Santee Cooper Project water bodies that are totally isolated from the lakes unless it conflicts with specific water uses or is identified as a state or federal noxious weed and poses a threat to Lakes Marion and Moultrie.

In order to enhance native plant growth and habitat throughout the lake system, S-C and the DNR will cooperate in implementing innovative management techniques. These techniques could include such measures as constructing grass carp barriers, introducing desirable native plant species, enhancing wildlife/waterfowl management areas, and implementing strategic lake level management measures.

The DNR and S-C will meet annually to review the results of the monitoring and treatment programs to determine the effectiveness of the programs, and to develop annual work plans. Every five years the parties will meet to conduct a comprehensive review of the programs and to determine the success in meeting the overall management goals. Based upon this review, the provisions of this agreement may be modified, as deemed appropriate, by the mutual consent of the parties.

## **APPENDIX F**

### **Summary of Aquatic Plant Control Expenditures**

## SUMMARY OF AQUATIC PLANT CONTROL EXPENDITURES

During 1981, the Council received \$60,000 in Federal matching funds through the U.S. Army Corps of Engineers. The Council allocated \$57,000 of these funds to the S.C. Public Service Authority for plant management at Lake Marion. The Authority used these funds to chemically treat approximately 500 acres of the area uplake of the Rimini railroad trestle. The herbicide diquat was used to treat for Brazilian elodea and other submersed weed species. The remainder of the Federal funds were used to assist in development of the Council's management program.

During 1982, \$30,000 in Federal funds were allocated to the S.C. Public Service Authority for control of hydrilla and other nuisance plants at Lake Marion. An additional \$13,500 were allocated to Berkeley County for control of water hyacinths at Goose Creek Reservoir.

During 1983, \$155,000 in Federal matching funds were allocated to the S.C. Public Service Authority for plant control at Lake Marion. These funds were used to treat approximately 1,400 acres of upper Lake Marion with diquat, endothall and fluridone for control of Brazilian elodea, hydrilla and other submersed plants. The Council also provided \$4,500 in Federal matching funds to Berkeley County for maintenance control of water hyacinths at Goose Creek Reservoir.

During 1984, \$249,500 in Federal funds and \$40,500 in State funds were allocated to the S.C. Public Service Authority for aquatic weed control at Lake Marion. The S.C. Electric and Gas Company was allocated \$25,000 for control of hydrilla and other submersed aquatic weeds at Back River Reservoir. Berkeley County was allocated \$5,000 for maintenance control of water hyacinth at Goose Creek Reservoir.

Calendar year 1985 represented the first year of significant funding for aquatic plant management in South Carolina since the establishment of the Aquatic Plant Management Program in 1980. Funding was available from State and Federal sources over separate fiscal years. A total expenditure of \$701,349 was used to control nuisance aquatic plant populations on 29 water bodies around the State. Of this expenditure, \$98,377 was used for biological control by triploid grass carp and \$602,972 was used for chemical control operations.

During 1986, a mild winter coupled with low lake levels and clear water due to a severe drought resulted in an abundance of submersed aquatic plants. Hydrilla populations in Lake Marion and Back River Reservoir increased in coverage and new populations were discovered in the Cooper River ricefields. A total of 38 water bodies (4,925 acres) were managed for aquatic weeds at a cost of \$704,090. Herbicide applications were made on 33 lakes (4,441 acres) at a cost of \$673,979. Biological controls were implemented on nine water bodies around the State at a cost of \$30,111.

During 1987, a total of \$604,695 in State and Federal funds were expended for aquatic weed control in public waters. Chemical control work amounting to \$599,445 was conducted in 26 public water

bodies. Biological control, including stocking triploid grass carp and alligatorweed flea beetles, was conducted at eight water bodies for a total expenditure of \$5,250.

During 1988, a total of \$631,164 in State, Federal, and local funds were expended for aquatic plant control activities in 25 water bodies. Because of reductions in the amount of Federal match from 70 percent to 50 percent of total control cost, local sponsors were for the first time required to provide at least 15 percent of control costs. Approved aquatic herbicides were applied to 3,258 acres on 21 water bodies at a total cost of \$583,764. Biological controls were implemented on four water bodies at a cost of \$47,400.

During 1989, a total of \$827,630 in Federal, State, and local funds were expended for aquatic plant control operations in 23 water bodies. Aquatic herbicides were applied to 2620 acres on 21 water bodies at a cost of \$422,009. A three year triploid grass carp stocking project was initiated on Lake Marion with the release of 100,000 sterile grass carp. Because this represents the largest such stocking in the country to date, biological control expenditures were substantially higher than in previous years, totaling \$405,621.

During 1990, a total of \$944,194 were expended for aquatic plant control activities on 24 water bodies. Herbicide treatments were made to all water bodies (2850 acres) at a cost of \$524,194. Lake Marion received its second installment of 100,000 triploid grass carp at a cost of \$420,000. Because of limited federal funds and a substantial increase in local funds (primarily from Santee Cooper), this was the first year that there were insufficient federal funds available to match all planned control operations. The Corps of Engineers provided 47 percent of total funding, while state and local entities provided 16 percent and 37 percent, respectively.

In 1991, aquatic plant management operations were conducted on 18 public water bodies at a total cost of \$1,965,387. The exceptionally large expenditure was a result of emergency control operations to alleviate blockage of the St. Stephen Hydroelectric facility on Lake Moultrie by hydrilla. A record high 6838 acres was treated with aquatic herbicides at a cost of \$1,505,771. Biological control agents were used on five lakes at a cost of \$459,615. Most of this included the third stocking of triploid grass carp in upper Lake Marion. While 50 percent of program funding was provided by the U.S. Army Corps of Engineers, 9 percent was provided by the State and 41 percent by local entities.

In 1992, 22 water bodies received control operations at a total cost of \$1,859,709. While last year's expenditures were higher, over 1,000 acres were treated by Santee Cooper at a cost of over \$200,000 but were not cost shared through the State program. Fifty percent of funding was provided by the U.S. Army Corps of Engineers, 8 percent by the State, and 42 percent by local entities. About 6,888 acres were treated with aquatic herbicide at a cost of \$1,447,864. Biological control agents (sterile grass carp and Tilapia) were introduced to six water bodies at a cost of \$411,845. This was the first year in which widespread hydrilla control was evident in upper Lake Marion from the grass carp. Hydrilla was controlled in over 6,500 acres in Stumphole, Low Falls,

Elliotts Flats, and tree line areas. Compared to 1990 coverage, this represents an 80 percent reduction.

During 1993, a total of \$2,050,736 were expended for aquatic plant control activities on 27 water bodies. Forty-six percent of the funding was provided by the U.S. Army Corps of Engineers, 5 percent by the Department of Natural Resources, and 49 percent by various local sponsors. Aquatic herbicide treatments were made on 23 water bodies (8,125 acres) at a total cost of \$1,828,335. Biological control agents (grass carp and tilapia) were used on 11 lakes at a cost of \$222,400. Grass carp stocked in upper Lake Marion in 1989-92 provided control (over 9,000 acres) for the second consecutive year. As a result of this success, stocking efforts were initiated in Lake Moultrie with the release of 50,000 grass carp. Hydrilla was discovered in Lake Murray this year resulting in unplanned treatment operations at several boat ramps and swimming beaches.

During 1994, aquatic plant management operations were conducted on 28 water bodies at a total cost of \$2,876,763. The U.S. Army Corps of Engineers provided 50 percent of all funds, while the State provided 7 percent and local entities provided 43 percent. Aquatic herbicide treatments were conducted on all water bodies (9,090 acres) at a cost of \$2,370,025. Grass carp were stocked in five lakes to control 10,242 acres at a cost of \$506,738. Lake Moultrie received the most grass carp (150,000 fish) to help increase the number of fish to target levels. Grass carp continue to control over 9,000 acres in upper Lake Marion for the third straight year. This year hydrilla was found in Lake Wateree for the first time resulting in unplanned treatments to attempt to eliminate it.

In 1995, a total of \$2,804,206 were expended for aquatic plant control activities on 30 water bodies. Fifty percent of the funding was provided by the U.S. Army Corps of Engineers, 44 percent was provided by local sponsors, and the state contributed 6 percent. Some level of herbicide treatment occurred on all the water bodies totaling about 9,710 acres at a cost of \$2,367,622. A total of 97,526 grass carp were stocked in five lakes at a total cost of \$435,084. Most of these were stocked in the Santee Cooper lakes (91,000) and Goose Creek Reservoir (6,000). Hydrilla was found in Lake Keowee for the first time this year which resulted in an unplanned treatment. Also *Salvinia molesta*, a federal noxious weed, was discovered in a private pond in Colleton County. Efforts were made to eradicate the infestation with treatments by the landowner and the state. Grass carp continue to provide excellent control in over 9,000 acres in upper Lake Marion; however, floating water hyacinths now infest much of this area impacting primarily shoreline and swamp areas.

Control expenditures in 1996 were about one-half of those in 1995 due in part to successful results from control efforts in previous years and in part to reductions in federal funding. A total of 19 water bodies were managed for nuisance species at a total cost of \$1,151,501; the Corps of Engineers provided 31%, the State provided 10%, and local entities provided 59%. Herbicide treatments were conducted in 4,920 acres at a cost of \$888,685; biocontrol agents were used in four lakes at a cost of \$262,816. Hydrilla coverage on the Santee Cooper lakes (Lakes Marion and Moultrie) declined by almost 80% due apparently to the successful stocking of sterile grass carp. As a result, herbicide treatments of hydrilla were reduced by a comparable amount. Hydrilla coverage has been essentially eliminated on Lake Wateree and substantially reduced on Lake Keowee through

a combination of herbicide treatments and drawdowns. A large drawdown and treatment on Lake Murray this year is hoped to have similar results.

During 1997, aquatic plant management operations were conducted on 21 water bodies at a total cost of \$459,783. This represents a 60% reduction from control costs in 1996 due to very successful hydrilla management efforts on the Santee Cooper lakes and Lake Murray coupled with limited Federal matching funds. Matching funds from the Corps of Engineers composed only 2 percent of total costs, while State and Local funds made up 38 percent and 60 percent, respectively. Sterile grass carp were stocked in five lakes to control 292 acres of submersed plants at a cost of \$15,951. Aquatic herbicides were used to treat 3,762 acres at a total cost of \$443,832. Most herbicide treatments (58%, 2,181 acres) were focused on water hyacinth which has expanded its range and now is found on six major water bodies. Water hyacinth treatments on the Ashepoo River were greater than originally planned and treatments on the Waccamaw River were unanticipated. Hydrilla coverage on the Santee Cooper lakes continued to decline in 1997 due to successful control by sterile grass carp resulting in sharp reductions in management expenditures. The drawdown and herbicide treatment on Lake Murray in 1996 resulted in better than anticipated hydrilla control this year. Hydrilla acreage was reduced 88 percent with a 45 percent reduction in shoreline miles.

Limited hydrilla coverage on the Santee Cooper Lakes, Lake Murray and Goose Creek Reservoir during 1998 helped reduce overall control expenditures for the third consecutive year. Total control cost for 1998 were 40% less than in 1997. A total of 1,862 acres on 17 water bodies were managed at a cost of \$273,223. The Department of Natural Resources provided 47% of total funding, while 25% was provided by the Corps of Engineers, and 28% by various local entities. Sterile grass carp are effectively controlling hydrilla growth in the Santee Cooper Lakes and Goose Creek Reservoir. About one-half of all herbicide treatments (940 ac.) were focused on water hyacinth control on coastal rivers and impoundments.

A total of 3,259 acres on 19 water bodies were managed in 1999 at a total cost of \$453,071. Funding support was 34% State (SCDNR), 21% Federal (USACOE), and 45% local match. Most herbicide treatments (1506 acres, 46%) were directed at controlling the growth of water hyacinth in seven water bodies. Hydrilla growth remains limited statewide due to control operations in previous years. Grass carp in the Santee Cooper Lakes (Lakes Marion and Moultrie) and Goose Creek Reservoir are effectively controlling hydrilla growth in those lakes. Hydrilla regrowth was evident in Lake Murray at the end of the year; however, higher than normal lake levels restricted herbicide treatments. Therefore, significant regrowth is expected next year.

During 2000, aquatic plant management operations were conducted on 21 water bodies at a total cost of \$483,236. State budget cuts at the end of the calendar year reduced control efforts by 21% of planned expenditures and shifted costs to local sponsors. Seventy percent of total costs were borne by local entities with the state paying the rest. Most of the control effort was focused on water hyacinth (31%), followed by hydrilla (25%) and Pithophora (19%). Hydrilla regrowth was significant on Lake Murray as predicted. Grass carp continue to control hydrilla on Goose Creek Reservoir and Lake Marion and Lake Moultrie.

During 2001, aquatic plant management operations were conducted on 2,775 acres on 25 water bodies at a total cost of \$508,075. Due to State budget cuts virtually all control costs were paid for with federal (41%) and local funds (59%). Hydrilla treatments were up this year (1,550 acres) because of a resurgence of hydrilla growth on Lake Murray; however, water hyacinth treatments were especially low (186 acres) due to a very cold period in December. Grass carp continue to provide effective control of hydrilla on Goose Creek Reservoir and the Santee Cooper Lakes.

During 2002, aquatic plant management operations were conducted on 2,239 acres on 17 water bodies at a total cost of \$297,236. Due to State budget cuts virtually all control costs were paid for with federal (37%) and local funds (63%). Water hyacinth treatments were up this year (1,186 acres) because of a milder than normal winter; however, hydrilla treatments were especially low (390 acres) due to the inability to treat Lake Murray. Grass carp continue to provide effective control of hydrilla on Goose Creek Reservoir and the Santee Cooper Lakes.

In 2003, aquatic plant management operations were conducted on 61340 acres in 12 water bodies at a total cost of \$639,328. Due to state budget cuts all control costs were paid for with federal (38%) and local funds (62%). Included in this total are the stocking of 64,500 sterile grass carp in Lake Murray to control 4300 acres of hydrilla at a cost of \$369,529. About 57% of all herbicide treatments (1005 ac.) were focused on water hyacinth control on coastal rivers and impoundments. Grass carp continue to provide effective control of hydrilla on Goose Creek Reservoir and the Santee Cooper Lakes.

A total of 2764 acres were treated in 2004 at a total cost of \$470,815. Local sponsors provided 41% of the cost, while the Corps of Engineers provided 30%. Funds from the State's Water Recreational Resource Fund (boat gas tax) paid for 29% of all control costs. The focus of most control was on water hyacinth (931 acres) and Phragmites (710 acres). Grass carp continue to provide effective control of hydrilla on Goose Creek Reservoir and the Santee Cooper Lakes. Preliminary surveys of Lake Murray indicate that grass carp stocked in 2003 are beginning to provide some control of hydrilla. The drawdown on Lake Murray over the past two years is also providing good hydrilla control in the drawdown zone.

In 2005 the focus of the Aquatic Nuisance Species Program was Phragmites control in coastal South Carolina, 1983 acres were treated at a cost of \$349,174. In all, a total of \$655,535 was spent on 3,935 acres of control of invasive plants. Local sponsors provided 32% of the cost, while the Corps of Engineers provided 35%. Funds from the State's Water Recreational Resource Fund (boat gas tax) paid for 33% of all control costs. Grass carp continue to provide effective control of hydrilla on the Santee Cooper Lakes and have provided excellent control on Lake Murray.

For 2006, Phragmites control was center stage and once again led the control efforts with 1950 acres treated at a cost of \$352,804. This is second only to last year's acreage of phragmites treated. In total 3983 acres of invasive species were treated at a cost of \$722,316. Funding from the Corps of Engineers was not available this year and the costs were almost evenly split between the local cost share monies and Water Recreation funds. Additional funding was used from the U.S. Navy, Naval

Weapons Station in Goose Creek. Included in that total was 242 acres of Phragmites and about 70 acres of pond work in the Marrington Recreation area. Findings in Goose Creek Reservoir and the Santee Cooper Lakes indicate that additional stockings of triploid grass carp may need to be reconsidered in 2007.

Increasing hydrilla and the abundance of native submersed vegetation in 2007 brought about maintenance stocking of Triploid Grass Carp in Lake Marion, Lake Moultrie, and Goose Creek Reservoir. A total of 2620 sterile carp were stocked in the Santee Cooper Lakes with an additional 185 fish stocked into Goose Creek Reservoir. In total 4208 acres of invasive species were treated at a cost of \$773,263. Costs were almost evenly split between the local cost share monies and Water Recreation funds. Additional funding was used from the U.S. Navy, Naval Weapons Station in Goose Creek and U. S. Army Corps of Engineers for treatment of phragmites on spoil areas in Charleston Harbor and the Intracoastal Waterway. Santee coastal WMA managers should now have gained the upper hand with an additional 714 acres treated on Santee Coastal. Yawkey continued treatment of phragmites (120 acres) with several problem areas which remain persistent throughout treatment. Additionally 904 acres of phragmites have been treated from Colleton County through Georgetown County.

2008 showed a rebound of hydrilla across the state. Hydrilla was discovered in several new sites and at some old sites this highly invasive species increased abundantly. Triploid grass carp maintenance stocking plans are being reconsidered because of the increased levels of hydrilla in the Santee Cooper Lakes and Goose Creek Reservoir. Cooperative efforts with Duke Energy, Lake Wylie Marine Commission, South Carolina DNR, and North Carolina wildlife agencies produced a management plan for the border lake, Lake Wylie. 3335 acres of invasive species were treated at a cost of \$641,791. Costs were split approximately 44% local cost share monies and 56% Water Recreation funds. Phragmites sites continued to decline in acreage and new cooperative agreements were put in place for water hyacinth control on public and private areas along the Pee Dee and Waccamaw Rivers. This agreement includes SCDNR, the U.S. Fish and Wildlife Service, the Nature Conservancy, and private landowners. New problems tackled by the ANS program include a highly invasive snail species in the Socastee area of Horry County (111 acres at \$3,671) and a toxic algae problem in Hopeland Gardens in Aiken, S.C.

**Table 2004-A. Summary of Expenditures by Source for Control Operations During 2004.**

<b>Water Body Name</b>	<b>Total Cost</b>	<b>Federal</b>	<b>State</b>	<b>Local</b>	<b>Local Sponsor</b>
Back River Reservoir	\$94,772	\$47,386	\$23,693	\$23,693	SCE&G, CCPW
Black Mingo Creek	\$2,523	\$1,262	\$630	\$631	Georgetown Co.
Black River	\$2,523	\$1,262	\$630	\$631	Georgetown Co.
Bonneau Ferry	\$10,736	\$0	\$10,736	\$0	SCDNR
Cooper River	\$62,011	\$31,006	\$15,502	\$15,503	Berkeley Co., SCE&G
Delta Plantation	\$2,158	\$0	\$2,158	\$0	SCDNR
Edisto River	\$1,733	\$0	\$520	\$1,213	SCDNR, USF&W
Goose Creek Reservoir	\$19,066	\$9,533	\$4,766	\$4,767	Charleston CPW
Lake Greenwood	\$10,711	\$5,356	\$2,677	\$2,678	Greenwood Co.
Lake Murray	\$1,364	\$682	\$341	\$341	SCE&G, Lexington Co., Richland Co.
Little Pee Dee River	\$7,131	\$3,566	\$1,783	\$1,783	Horry Co.
Lumber River	\$803	\$401	\$201	\$201	Horry Co.
Pee Dee River	\$4,206	\$2,103	\$1,052	\$1,051	Georgetown Co.
Santee Coastal Reserve	\$114,517	\$0	\$34,355	\$80,162	Santee Coastal Reserve
Yawkey Wildlife Center	\$43,294	\$0	\$12,988	\$30,306	Yawkee Wildlife Center
Lake Marion	\$24,531	\$12,265	\$6,133	\$6,133	Santee Cooper
Lake Moultrie	\$9,167	\$4,583	\$2,292	\$2,292	Santee Cooper
Taw Caw Impoundment	\$3,750	\$1,875	\$937	\$938	Santee Cooper
Potato Creek Imp.	\$12,692	\$6,346	\$3,173	\$3,173	Santee Cooper
Dean Swamp	\$20,883	\$10,441	\$5,221	\$5,221	Santee Cooper
Fountain Lake	\$819	\$409	\$205	\$205	Santee Cooper
Church Branch Imp.	\$9,425	\$4,712	\$2,356	\$2,357	Santee Cooper
Charlestown Landing SP	\$1,815	\$0	\$0	\$1,815	SCPRT
Kings Mt. SP Lk. Crawford	\$3,325	\$0	\$0	\$3,325	SCPRT
Sesquicentennial SP	\$6,860	\$0	\$0	\$6,860	SCPRT
<b><i>SCDNR Total</i></b>	<b>\$377,548</b>	<b>\$102,555</b>	<b>\$112,034</b>	<b>\$162,958</b>	
<b><i>State Park Lake Total</i></b>	<b>\$12,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$12,000</b>	
<b><i>Santee Cooper Total</i></b>	<b>\$81,266</b>	<b>\$40,633</b>	<b>\$20,317</b>	<b>\$20,316</b>	
<b><i>Grand Total</i></b>	<b>\$470,814</b>	<b>\$143,188</b>	<b>\$132,348</b>	<b>\$195,276</b>	

Table 2004-B Summary of S.C. Aquatic Plant Management Control Operations and Expenditures During 2004									
Water Body	Target Plants		Acres	Total Cost	Cost/Acre	Control Agent	Rate	Management Objective	Control Effectiveness
	Hydrilla	Water Hyacinth							
Back River Reservoir	Hydrilla		167.25	\$ 38,119.62	\$ 227.92	Komeen	16 gal/ac	Reduce problem plants to enhance public access, use, water quality, and maintain electric power generation and minimize impacts to water intakes.	> 95% control
	Hydrilla		25.00	\$ 16,281.75	\$ 651.27	Aquathol Super K	40 lbs/ac		<40% control
	Water hyacinth		238.00	\$ 18,927.20	\$ 87.40	Reward	0.5 gal/ac		90% control
	Water hyacinth		90.00	\$ 10,707.40	\$ 118.97	Reward	0.5 - 0.75 gal/ac		90% control
	Water primrose		4.00	\$ 1,282.56	\$ 320.64	Hydrothol 191 Liquid	7 gal/ac		>95% control
TOTAL			589.25	\$ 94,771.63	\$ 160.83				90% control
Black Mingo Creek	Water primrose		501.25	\$ 62,011.44	\$ 123.71	Habitat/Glypro	0.250 gal/ac/750 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control with some regrowth.
	Water primrose		20.00	\$ 2,523.00	\$ 126.15	Habitat/Glypro	0.250 gal/ac/750 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control with some regrowth.
TOTAL			521.25	\$ 64,534.44	\$ 123.71				
Cooper River	Hydrilla		60.25	\$ 13,732.18	\$ 227.92	Komeen	16 gal/ac	Provide boat trails to main channel through hydrilla. Reduce problem plants to enhance public access and use.	> 95% control
	Water hyacinth		193.00	\$ 15,868.20	\$ 87.40	Reward	0.5 gal/ac		90% control
	Water hyacinth		174.00	\$ 21,120.12	\$ 121.38	Reward	0.75 gal/ac		> 95% control
	Water hyacinth		66.00	\$ 9,413.58	\$ 142.63	Habitat/Glypro	0.250 gal/ac/750 gal/ac		> 95% control
	Water primrose		8.00	\$ 877.36	\$ 109.67	Habitat	0.250 gal/ac		90% control
TOTAL			501.25	\$ 62,011.44	\$ 123.71				
Goose Creek Reservoir	Water hyacinth		51.00	\$ 4,457.40	\$ 87.40	Reward	0.5 gal/ac	Reduce water hyacinth & water lettuce to greatest extent possible.	> 95% control
	Water hyacinth		28.00	\$ 3,396.64	\$ 121.38	Reward	0.5 - 0.75 gal/ac		> 95% control
	Water lettuce		125.00	\$ 10,925.00	\$ 87.40	Reward	0.5 gal/ac		> 95% control
	Cutgrass/Water primrose		2.00	\$ 265.26	\$ 142.63	Habitat/Glypro	0.250 gal/ac/750 gal/ac		90% control
	Phragmites		208.00	\$ 19,096.30	\$ 92.55	Habitat	0.375 gal/ac		90% control
TOTAL			414.00	\$ 38,130.60	\$ 92.14				
Edisto River	Phragmites		12.00	\$ 1,733.52	\$ 144.46	Habitat	0.375 gal/ac		> 90% control of hydrilla. Note: Eradication of hydrilla yet to be determined.
	Hydrilla		25.00	\$ 7,020.75	\$ 280.83	Aquathol-k	5 gal/ac	Eradicate hydrilla from site.	> 95% control
Lake Greenwood	Naiad		20.00	\$ 3,690.60	\$ 184.53	Aquathol-k	3 gal/ac	Reduce problem plants to enhance public access, use and water quality.	> 95% control
	Hydrilla		45.00	\$ 10,711.35	\$ 238.03	Aquathol-k	12 gal/ac	Reduce hydrilla to minimize spread and impacts to public access and use.	> 95% control
TOTAL			65.00	\$ 14,402.55	\$ 221.56				
Lumber River	Water hyacinth		5.00	\$ 1,363.80	\$ 272.76	Nautique	250 gal/ac/500 gal/ac	Reduce problem plants to enhance public access, use and water quality.	90% control
	Water hyacinth		6.00	\$ 802.86	\$ 133.81	Habitat/Eagle	250 gal/ac/500 gal/ac	Reduce problem plants to enhance public access, use and water quality.	90% control
	Water hyacinth		50.00	\$ 7,131.50	\$ 142.63	Habitat/Glypro	0.250 - 0.375 gal/ac/0.750 gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	80% control
	Water primrose		56.00	\$ 7,934.36	\$ 141.69	Habitat/Glypro			
	Misc Ponds & Reserves		66.00	\$ 10,735.60	\$ 162.66	Aquathol-k			
TOTAL			127.00	\$ 30,978.12	\$ 243.65				
Delta Plantation	Salvinia Molesta		66.00	\$ 10,735.60	\$ 162.66	Aquathol-k	1 gal/ac	Eradicate Salvinia from site.	75% control
	Salvinia Molesta		4.00	\$ 538.84	\$ 134.71	Reward	0.500 gal/ac		> 95% control
TOTAL			70.00	\$ 11,274.44	\$ 160.64				
Pee Dee River	Water Hyacinth		2.00	\$ 1,618.86	\$ 809.43	Sonar	0.5gal/ac	Reduce hyacinth to minimize spread and impacts to public access and use.	90% control
	Water Hyacinth		40.00	\$ 3,496.00	\$ 87.40	Reward	.375 gal/ac/750gal/ac	Reduce phragmites to enhance public access and use.	> 95% control
Sandy Island	Phragmites		4.00	\$ 709.68	\$ 177.42	Habitat/Glypro	.375 gal/ac/750gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
	Phragmites		44.00	\$ 4,205.68	\$ 95.58	Habitat/Glypro	.375 gal/ac/750gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
TOTAL			48.00	\$ 5,015.36	\$ 104.50				
Santee Coastal Reserve	Phragmites		494.00	\$ 114,516.98	\$ 231.82	Habitat/Glypro	375 gal/ac/750gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
	Phragmites		464.00	\$ 114,516.98	\$ 246.80	Habitat/Glypro	375 gal/ac/750gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
TOTAL			958.00	\$ 229,033.96	\$ 239.81				
Tom Yawkey	Phragmites		200.00	\$ 43,294.00	\$ 216.47	Habitat/Glypro			
	Phragmites		200.00	\$ 45,294.00	\$ 226.47	Habitat/Glypro			
TOTAL			400.00	\$ 88,588.00	\$ 221.47				
Santee Cooper Lakes	Water hyacinth		14.00	\$ 1,575.66	\$ 112.55	Reward, Glyphosate	5 gal/ac, .75 gal/ac	Reduce problem plant populations to reduce impacts to public access, recreational use, irrigation withdrawals, navigation, and water quality.	65% control at end of season
	Cabomba, Variable Leaf Water Milfoil, Parrots Feather		0.50	\$ 60.49	\$ 120.98	Sonar, Renovate	40 lbs/ac, .5 gal/ac		> 95% control
	Giant Cutgrass, Arundo Donax		51.50	\$ 5,884.02	\$ 114.25	Habitat, Habitat/Glyphosate, Glyphosate, Renovate	.25 - .375 gal/ac, .125 - .25 / .50 gal/ac, .75 gal/ac		> 85% control
	Lynghya, Pithophora		13.00	\$ 1,507.99	\$ 116.00	Hydrothol 191 Liquid / Granular, Curime Plus Granular, K-Tea	.5 - 1.0 gal / 60-80 lbs/ac, 60 lbs/ac, 2.0 - 6.0 gal/ac		
	Water Hyacinth		110.50	\$ 10,654.73	\$ 96.42	Reward, Renovate	.5 gal/ac, .5 gal/ac		
TOTAL			179.50	\$ 29,676.80	\$ 165.25				
Water Primrose, Alligatorweed, Water Pod, Water Willow	Water Primrose		36.50	\$ 4,847.98	\$ 132.82	Habitat, Habitat/Glyphosate, Glyphosate, Renovate	.50 gal/ac, .125 - .25 / .50 gal/ac, .75 gal/ac, .50 gal/ac		
	Water Willow		228.00	\$ 24,530.87	\$ 108.54				
TOTAL			264.50	\$ 29,378.77	\$ 111.04				

**Table 2005-A. Summary of Expenditures by Source for Control Operations During 2005.**

<b>Water Body Name</b>	<b>Total Cost</b>	<b>Federal</b>	<b>State</b>	<b>Local</b>	<b>Local Sponsor</b>
Back River Reservoir	\$77,533	\$31,952	\$21,516	\$24,066	SCE&G, CPW
Barauch/Winyah Bay	\$14,100	\$0	\$4,230	\$9,870	Baruch Institute
Black River	\$1,040	\$520	\$260	\$260	Georgetown Co.
Bonneau Ferry WMA	\$20,072	\$0	\$20,072	\$0	SCDNR
Cooper River	\$32,635	\$13,609	\$9,127	\$9,898	Berkeley Co., SCE&G
Delta Plantation	\$399	\$0	\$399	\$0	SCDNR
Donnelley WMA	\$12,700	\$0	\$3,810	\$8,890	SCDNR
Ace Basin	\$4,054	\$0	\$1,267	\$2,787	SCDNR, USF&W
Goose Creek Reservoir	\$20,993	\$8,406	\$5,854	\$6,733	CPW
Lake Greenwood	\$14,028	\$5,611	\$4,208	\$4,208	Greenwood Co.
Lake Marion	\$22,102	\$8,841	\$6,631	\$6,631	Santee Cooper
Lake Moultrie	\$7,405	\$2,962	\$2,222	\$2,222	Santee Cooper
S/C Impoundments	\$83,353	\$33,341	\$25,006	\$25,006	Santee Cooper
Lake Murray	\$1,481	\$740	\$370	\$370	SCE&G, Lexington Co., Richland Co.
Pee Dee River	\$1,335	\$668	\$334	\$334	Georgetown Co.
Samworth WMA	\$8,480	\$3,436	\$2,544	\$2,500	SCDNR
Santee Coastal Reserve	\$304,736	\$121,174	\$94,946	\$88,617	SCDNR
Santee Delta WMA	\$5,727	\$661	\$1,718	\$3,349	SCDNR
Waccamaw River	\$617	\$207	\$185	\$225	Horry Co.
Yawkey Wildlife Center	\$18,506	\$0	\$5,552	\$12,954	Yawkey Foundation
Charlestown Landing	\$0	\$0	\$0	\$0	SCPRT
Kings Mt. Lk. Crawford	\$0	\$0	\$0	\$0	SCPRT
Lee	\$0	\$0	\$0	\$0	SCPRT
Little Pee Dee	\$0	\$0	\$0	\$0	SCPRT
Paris Mountain	\$0	\$0	\$0	\$0	SCPRT
Santee (swimming lake)	\$0	\$0	\$0	\$0	SCPRT
Sesquicentennial	\$0	\$0	\$0	\$0	SCPRT
<b><i>SCDNR Total</i></b>	<b>\$538,437</b>	<b>\$186,984</b>	<b>\$175,060</b>	<b>\$176,393</b>	
<b><i>State Park Lake Total</i></b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	
<b><i>Santee Cooper Total</i></b>	<b>\$112,861</b>	<b>\$50,683</b>	<b>\$38,284</b>	<b>\$38,284</b>	
<b><i>Grand Total</i></b>	<b>\$651,298</b>	<b>\$232,128</b>	<b>\$210,251</b>	<b>\$208,919</b>	
		<b>36%</b>	<b>32%</b>	<b>32%</b>	

Table 2005-B Summary of S.C. Aquatic Plant Management Control Operations and Expenditures During 2005

Water Body	Target Plants	Acres	Total Cost	Cost/Acre	Control Agent	Rate	Management Objective	Control Effectiveness
Back River Reservoir	Hydrilla	179.50	\$ 47,975.60	\$ 267.30	Komeen, Komeen/Reward	16 gallas, 4gallas/2gallac	Reduce problem plants to enhance public access, use water quality, and maintain electric power generation and minimize impacts to water intakes.	> 95% control
	Water hyacinth	276.50	\$ 25,444.01	\$ 92.36	Renovate 3	0.500 - 0.750 gallas		90% control
	Water primrose	40.00	\$ 3,380.00	\$ 84.50	Reward	0.500 gallas		90% control
	Water primrose	52.00	\$ 4,568.25	\$ 95.54	Renovate 3	0.500 - 0.750 gallas		90% control
TOTAL		\$ 547.00	\$ 81,771.86	\$ 149.49	Habitat	0.375 gallas	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
Baruch/ Winyah Bay	Phragmites	80.00	\$ 14,100.00	\$ 176.25	Habitat	0.375 gallas	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
TOTAL		\$ 12.00	\$ 14,100.00	\$ 176.25	Habitat	0.187 gallas	Reduce problem plants to enhance public access, use and water quality.	95% control with some regrowth.
Black River	Alligatorweed	12.00	\$ 1,039.50	\$ 86.63	Habitat	0.187 gallas	Reduce problem plants to enhance public access, use and water quality.	95% control with some regrowth.
TOTAL		\$ 12.00	\$ 1,039.50	\$ 86.63	Habitat	0.187 gallas	Reduce problem plants to enhance public access, use and water quality.	95% control with some regrowth.
Bonneau Ferry	Water Primrose, Water hyacinth,	142.00	\$ 19,650.75	\$ 138.39	Habitat	0.250 - 0.1875 gallas	Reduce phragmites to enhance waterfowl habitat, public access and use. This is year 2 of a 3 year plan to restore Bonneau Ferry.	> 95% control
Misc Ponds & Reserves	Frog's bit, Lotus, Cutgrass, Cattails	4.00	\$ 421.50	\$ 105.38	Renovate 3	0.750 gallas		
TOTAL		\$ 146.00	\$ 20,072.25	\$ 137.48	Komeen	16 gallas	Provide boat trails to main channel through hydrilla. Reduce problem plants to enhance public access and use.	> 95% control
Cooper River	Hydrilla	60.50	\$ 16,020.40	\$ 264.80	Komeen	16 gallas	Provide boat trails to main channel through hydrilla. Reduce problem plants to enhance public access and use.	> 95% control
	Water hyacinth	183.00	\$ 15,139.00	\$ 82.73	Renovate 3	0.750 gallas		> 95% control
	Water primrose	14.00	\$ 1,475.25	\$ 105.38	Habitat	0.250 gallas		90% control
TOTAL		\$ 257.50	\$ 32,634.65	\$ 126.74	Habitat	1 gallas	Eradicate Salvinia from site.	~95% control of areas treated at the end of season.
Della Plantation - Jasper County	Salvinia Molesta	1.50	\$ 114.63	\$ 76.42	Reward	0.500 gallas		
	Salvinia Molesta	1.50	\$ 282.74	\$ 188.49	Sonar	0.500 gallas		
TOTAL		\$ 3.00	\$ 397.37	\$ 132.46	Habitat	0.250 gallas	Reduce problem plants to enhance waterfowl habitat, public access and use.	95% control with some regrowth.
Donnelley WMA	Frog's Bit, Cattails, swamp loosestrife	62.00	\$ 9,327.00	\$ 150.44	Habitat	0.250 gallas	Reduce problem plants to enhance waterfowl habitat, public access and use.	95% control with some regrowth.
	Frog's Bit	29.00	\$ 3,373.38	\$ 116.32	Renovate 3	0.500 - 0.75 gallas		
	Phragmites	23.00	\$ 4,053.75	\$ 176.25	Habitat	0.375 gallas	Reduce phragmites to enhance waterfowl habitat, public access and use.	> 95% control
ACE Basin/Edisto & Combahee Rivers)		114.00	\$ 16,754.13	\$ 146.97	Habitat	0.750 gallas	Reduce water hyacinth & water lettuce to greatest extent possible.	> 95% control
	Water hyacinth	67.00	\$ 7,060.13	\$ 105.38	Renovate 3	0.500 - 0.750 gallas		> 95% control
	Water lettuce	24.00	\$ 1,974.00	\$ 82.25	Renovate 3	0.500 - 0.750 gallas		> 95% control
	Water lettuce	120.00	\$ 10,140.00	\$ 84.50	Reward	0.500 gallas		> 95% control
	Water hyacinth/water primrose	21.00	\$ 1,819.13	\$ 86.63	Habitat	0.187 gallas		90% control
TOTAL		\$ 232.00	\$ 20,993.26	\$ 90.49	Habitat	5 gallas	Eradicate hydrilla from site.	> 90% control of Hydrilla. Note: Eradication of hydrilla yet to be determined.
Lake Greenwood	Hydrilla	27.00	\$ 12,528.00	\$ 464.00	Aquathok	3 gallas	Reduce problem plants to enhance public access, use and water quality.	> 95% control
	Naiad	6.00	\$ 1,500.00	\$ 250.00	Aquathok	3 gallas	Reduce problem plants to enhance public access, use and water quality.	> 95% control
TOTAL		\$ 33.00	\$ 14,028.00	\$ 425.09	Renovate 3	0.500 gallas	Reduce hydrilla to minimize spread and impacts to public access and use.	> 95% control
Lake Murray	Water primrose	18.00	\$ 1,480.50	\$ 82.25	Renovate 3	0.375 gallas	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
TOTAL		\$ 18.00	\$ 1,480.50	\$ 82.25	Habitat	0.375 gallas	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
Pee Dee River	Phragmites	9.00	\$ 1,335.00	\$ 148.33	Habitat	0.375 gallas	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
TOTAL		\$ 9.00	\$ 1,335.00	\$ 148.33	Habitat	0.375 gallas	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
Samworth WMA	Phragmites	2.50	\$ 440.49	\$ 176.20	Habitat	0.375 gallas	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
	Water hyacinth	64.00	\$ 8,040.00	\$ 125.63	Habitat	0.1875 gallas	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
TOTAL		\$ 66.50	\$ 8,480.49	\$ 127.63	Habitat	0.375 gallas	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
Santee Coastal Reserve	Phragmites	1729.00	\$ 304,736.25	\$ 176.25	Habitat	0.375 gallas	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
TOTAL		\$ 1729.00	\$ 304,736.25	\$ 176.25	Habitat	0.375 gallas	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
Santee Delia WMA	Phragmites, willows	32.50	\$ 5,727.45	\$ 176.23	Habitat	0.375 gallas	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
TOTAL		\$ 4.00	\$ 342.25	\$ 85.56	Habitat	0.1875 gallas	Reduce hyacinth to minimize spread and impacts to public access and use.	90% control
Waccamaw River/Sandy Island	Water Hyacinth	2.00	\$ 274.50	\$ 137.25	Habitat	0.375 gallas	Reduce phragmites to enhance public access and use.	> 95% control
TOTAL		\$ 6.00	\$ 616.75	\$ 102.79	Habitat	0.375 gallas	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
Tom Yawkey Wildlife Center	Phragmites	105.00	\$ 18,506.25	\$ 176.25	Habitat	0.375 gallas	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
TOTAL		\$ 105.00	\$ 18,506.25	\$ 176.25	Habitat	0.375 gallas	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
SCDNR TOTAL:		\$ 3,390.50	\$ 542,673.71	\$ 160.06				

Table 2005-B Summary of S.C. Aquatic Plant Management Control Operations and Expenditures During 2005

Water Body	Target Plants	Acres	Total Cost	Cost/Acre	Control Agent	Rate	Management Objective	Control Effectiveness	
Santee Cooper Lakes Lake Marion	American Lotus, Waterlily, Water Shield, Floating Heart	2.0	149.16	\$ 74.58	Glyphosate, Renovate	75 gal/ac, 50 gal/ac	Provide access to open water areas for public use	>90% control of plant in areas treated at the end of season.	
	Giant Cudgrass, Arundo Donax	48.0	6,286.76	\$ 130.97	Habitat, Habitat/Glyphosate, Glyphosate, Renovate	25 - 375 gal/ac, 125 - 25 / 50 gal/ac, 75 gal/ac	Reduce plant encroachment on lake-front property and public access areas. Restoration of waterfowl habitat.	>95% control of plant in areas treated at the end of season. * Arundo ~50% control	
	Lygbya, Pithophora	16.0	2,267.45	\$ 141.72	K-Tea / Oide Kick	4 - 6 gal/ac	Reduce algal mats to enhance recreational use of water and reduce interference in agricultural irrigation intakes.	90% control of plant in areas treated at the end of season.	
	Water Hyacinth	77.5	9,908.57	\$ 127.85	Reward, Renovate	5 gal/ac, 5 gal/ac	Reduce problem plant population to provide public access to open water areas and prevent movement into other areas treated.	>90% control of plant in areas treated.	
	Water Primrose, Alligatorweed, Water Pod, Water Willow	14.0	3,490.35	\$ 249.31	Habitat, Habitat/Glyphosate, Glyphosate, Renovate	375 - 50 gal/ac, 125 - 25 / 50 gal/ac, 75 gal/ac, 50 gal/ac	Reduce problem plant population to provide public and shoreline access.	>85% control of plant in areas treated at end of season. Renovation was necessary in areas where leaves of plant were partially submerged during initial treatment	
	TOTAL	157.5	22,102.30	\$ 140.33					
	Lake Meulie	American Lotus, Water Lily, Water Shield	21.0	2,102.31	\$ 100.11	Glyphosate, Renovate	75 gal/ac, 50 gal/ac	Reduce plant population to provide public access to coves and open water areas. Restoration of waterfowl habitat.	>90% control of plant in areas treated at end of season.
		Cabomba, Watermilfoil	1.0	403.11	\$ 403.11	Sonar Q / PR	11 lbs/ac	Reduce problem plants in dead-end coves where navigation and recreation are adversely affected.	~80% control of plant in areas treated at end of season.
		Hydrilla	0.5	115.94	\$ 231.88	Aquathol K Liquid	6 - 8 gal/ac	Eliminate plant population to provide access to coves and prevent spread to other areas of lake.	>90% control of plant in areas treated at end of season.
		Water Primrose, Alligatorweed	2.0	174.83	\$ 87.42	Habitat, Habitat/Glyphosate, Glyphosate, Renovate	50 gal/ac, 125 - 25 / 50 gal/ac, 75 gal/ac, 50 gal/ac	Reduce problem plant population to provide public and shoreline access.	~85% control of plant in areas treated at end of season. Renovation was necessary in areas where leaves of plant were partially submerged during initial treatment
Water Hyacinth		2.0	179.74	\$ 89.87	Renovate, Reward	50 gal/ac	Reduce problem plant population to provide public and shoreline access.	>95% control of plant in areas treated at the end of season.	
Water Willow		0.7	259.68	\$ 370.97	Habitat, Habitat/Glyphosate, Glyphosate, Renovate	375 - 50 gal/ac, 125 - 25 / 50 gal/ac, 75 gal/ac, 50 gal/ac	Reduce problem plant population to provide public and shoreline access.	75% control of plant in areas treated at the end of season.	
Giant Cudgrass, Cattail, Arundo		29.0	4,169.52	\$ 143.78	Habitat, Habitat/Glyphosate, Glyphosate, Renovate	375 - 50 gal/ac, 125 - 25 / 50 gal/ac	Reduce plant encroachment on shoreline property and public access.	>95% control of plant in areas treated at the end of season.	
TOTAL		59.20	7,405.13	\$ 131.76					
Santee Cooper Lakes TOTAL:		213.70	29,507.43	\$ 138.08					
Santee Cooper Impoundments Law Craw Impoundment		Cornball	18.70	6,297.96	\$ 336.79	Aquathol K Liquid	5 - 6 gal/ac	Reduce plant population to provide public access to shoreline, coves and open water areas	<50% control of plant in areas treated at the end of season.
	Hydrilla	31.00	10,677.76	\$ 344.44	Aquathol K Liquid	6 - 8 gal/ac	Eliminate plant population to provide public access to coves and open water areas and prevent spread to other areas of lake.	<50% control of plant in areas treated at the end of season.	
	Water Primrose, Alligatorweed,	8.00	917.97	\$ 114.75	Habitat/Glyphosate, Glyphosate,	25 - 375 gal/ac, 125 - 25 / 50	Reduce problem plant population to provide public and	~85% control of plant in areas	
	TOTAL	57.70	17,893.69	\$ 310.12					
	Potato Creek Impoundment *	120.00	21,986.68	\$ 183.22	Aquathol K Liquid, Sonar Q / PR, AS	5 - 8 gal/ac, 125 - 1.35 lbs/ac, 0.025 gal/ac	Reduce plant population to provide residential and public access to open water areas and prevent spread to other	Undetermined	
	Giant Cudgrass, Cattail	2.00	279.79	\$ 139.90	Habitat, Habitat/Glyphosate, Glyphosate	25 - 375 gal/ac, 125 - 25 / 50 gal/ac, 75 gal/ac	Reduce plant population to provide residential and public access to open water areas. To improve waterfowl access to SCDNR duck boxes	~100% control of areas treated at the end of season.	
	TOTAL	122.00	22,266.47	\$ 182.51					
	Dean Swamp	47.70	16,998.16	\$ 356.36	Aquathol K Liquid	6 - 8 gal/ac	Reduce plant population to provide residential and public access to open water areas and prevent spread to other	<50% control of areas treated at the end of season.	
	Water Primrose, Alligatorweed	5.50	713.83	\$ 129.79	Habitat/Glyphosate, Glyphosate, Renovate	25 - 375 gal/ac, 125 - 25 / 50 gal/ac, 75 gal/ac, 50 gal/ac	Provide shoreline access.	85% control of plant in areas treated at end of season	
	Cabomba	4.00	1,696.16	\$ 424.04	Sonar PR / Q	11 lbs/ac	Provide shoreline access.	~90% control of areas treated at the end of season.	
Lygbya, Pithophora	11.00	1,495.64	\$ 135.97	K-Tea / Oide Kick	4 - 6 gal/ac	Reduce algal mats to enhance recreational use of water.	~80% control of plant in areas treated at the end of season.		
TOTAL:	68.20	20,903.79	\$ 306.51						

Table 2005-B Summary of S.C. Aquatic Plant Management Control Operations and Expenditures During 2005

Water Body	Target Plants	Acres	Total Cost	Cost/Acre	Control Agent	Rate	Management Objective	Control Effectiveness
Fountain Lake	Water Primrose, Alligatorweed	5.50	\$ 645.62	\$ 117.39	Habitat/Glyphosate, Glyphosate, Renovate	25 - 375 gal/ac, 125 - 25 / 50 gal/ac, 75 gal/ac, 50 gal/ac	Provide shoreline access.	>85% control of plant in areas treated at end of season. Retreatment was necessary in areas where leaves of plant were partially submerged during initial treatment
TOTAL		5.50	\$ 645.62	\$ 117.39				
Church Branch Impoundment	Giant Cutgrass, Cattail	4.25	\$ 573.89	\$ 135.03	Habitat, Habitat/Glyphosate, Glyphosate	25 - 375 gal/ac, 125 - 25 / 50 gal/ac, 75 gal/ac	Open areas at head of coves to reduce sediment buildup through increased flow and provide shoreline access.	>90% control of plant in areas treated at the end of season.
	Lyngbya, Pithophora	12.00	\$ 1,239.23	\$ 103.27	K-Tea / Cide Kick	4 - 6 gal/ac	Eliminate plant population to provide public access to coves and open water areas and prevent spread to other areas of lake.	>90% control of plant in areas treated at the end of season.
	Cabomba	3.00	\$ 1,389.39	\$ 463.13	Sonar PR / Q	11 lbs/ac	Reduce plant population to provide public access to coves and open water areas	>90% control of plant in areas treated at the end of season.
	Pondweed	14.70	\$ 4,701.13	\$ 319.80	Aquathol K Liquid	5 - 6 gal/ac	Open areas at head of coves to provide shoreline access.	>40% control of plant in areas treated at the end of season.
	Water Shield	1.00	\$ 41.70	\$ 41.70	Glyphosate, AquabupH	7.5 gal/ac, 25 gal/ac	Open areas at head of coves to reduce sediment buildup through increased flow and provide shoreline access.	>80% control of plant in areas treated at the end of season.
	Slender Naiad	42.00	\$ 13,698.58	\$ 326.16	Aquathol K Liquid	5 - 6 gal/ac	Open areas at head of coves to reduce sediment buildup through increased flow and provide shoreline access.	>90% control of plant in areas treated at the end of season.
TOTAL		76.95	\$ 21,643.92	\$ 281.27				
IMPOUNDMENTS TOTAL		330.35	\$ 83,353.49	\$ 252.32				
SCDNR TOTAL		3,390.60	\$ 642,673.71	\$ 160.06				
SANTEE COOPER TOTAL		544.05	\$ 112,860.92	\$ 207.45				
GRAND TOTAL		3934.55	\$ 655,534.63	\$ 166.61				

**Table 2006-A. Summary of Expenditures by Source for Control Operations During 2006.**

<b>Water Body Name</b>	<b>Total Cost</b>	<b>Federal</b>	<b>State</b>	<b>Local</b>	<b>Local Sponsor</b>
1 Back River Reservoir	\$64,488	\$0	\$32,244	\$32,244	SCE&G, CPW
2 Baruch Institute	\$19,879	\$0	\$9,939	\$9,939	Baruch Inst.
3 Belle Isle	\$730	\$0	\$730	\$-	Belle Isle
4 Bonneau Ferry WMA	\$7,955	\$0	\$7,955	\$-	SCDNR
5 Cooper River	\$19,934	\$0	\$9,966	\$9,967	Berkeley Co., SCE&G
6 Donnelley WMA	\$3,817	\$0	\$1,908	\$1,908	SCDNR, USF&W
7 Dungannon HP	\$1,123	\$0	\$561	\$561	SCDNR
8 Goose Creek Reservoir	\$27,516	\$0	\$13,758	\$13,758	CPW
9 Lake Darpo	\$2,406	\$0	\$1,203	\$1,203	Darlington Co.
10 Lake Greenwood	\$16,219	\$0	\$8,110	\$8,110	Greenwood Co.
11 Lake Marion	\$55,784	\$0	\$27,892	\$27,892	Santee Cooper
12 Lake Moultrie	\$9,073	\$0	\$4,537	\$4,537	Santee Cooper
13 Santee Cooper	\$139,905	\$0	\$52,171	\$87,734	Santee Cooper
14 Naval Weapons Station	\$53,436	\$0	\$-	\$53,436	US Navy
15 Santee Coastal Reserve	\$243,154	\$0	\$181,154	\$62,000	Santee Coastal Reserve
16 Waccamaw River/ Georgetown Parks	\$6,774	\$0	\$4,774	\$2,000	Georgetown Co.
17 Samworth WMA	\$912	\$0	\$912	\$-	SCDNR
18 Yawkey Wildlife Center	\$36,475	\$0	\$18,238	\$18,238	Yawkey Wildlife Center
19 Barnwell SP	\$1,517	\$0	\$759	\$759	SCPRT
20 Charlestowne Landing SP	\$413	\$0	\$206	\$206	SCPRT
21 H Cooper Black	\$1,012	\$0	\$506	\$506	SCPRT
22 King's Mountain SP	\$1,040	\$0	\$520	\$520	SCPRT
23 Little Pee Dee SP	\$5,058	\$0	\$2,529	\$2,529	SCPRT
24 Santee SP	\$1,170	\$0	\$585	\$585	SCPRT
25 Sesquicentennial SP	\$2,529	\$0	\$1,265	\$1,265	SCPRT
<b><i>SCDNR Total</i></b>	<b><i>\$504,816</i></b>	<b><i>\$0</i></b>	<b><i>\$291,452</i></b>	<b><i>\$213,363</i></b>	
<b><i>State Park Lake Total</i></b>	<b><i>\$12,739</i></b>	<b><i>\$0</i></b>	<b><i>\$6,369</i></b>	<b><i>\$6,369</i></b>	
<b><i>Santee Cooper Total</i></b>	<b><i>\$204,761</i></b>	<b><i>\$0</i></b>	<b><i>\$84,598</i></b>	<b><i>\$120,162</i></b>	
<b><i>Grand Total</i></b>	<b><i>\$722,316</i></b>	<b><i>\$0</i></b>	<b><i>\$382,419</i></b>	<b><i>\$339,896</i></b>	

Table 2006-B Summary of S.C. Aquatic Plant Management Control Operations and Expenditures During 2006						
Water Body	Target Plants	Acres	Total Cost	Cost/Acre	Control Agent	Rate
Back River Reservoir	Hydrilla	125.00	\$ 35,883.00	\$ 287.06	Komeen/Komeen-Reward	16 gal/ac/4 gal/ac-2gal/ac
	Water hyacinth	293.00	\$ 24,976.79	\$ 88.26	Renovate	0.500 - 0.750 gal/ac
	Fanwort	1.50	\$ 285.00	\$ 190.00	Hardball	5 gal/ac
	Water primrose	33.00	\$ 3,342.99	\$ 101.30	Renovate	0.5 - 0.75 gal/ac
<b>TOTAL:</b>	(Winyah Phragmites)	442.50	\$ 64,487.78	\$ 145.74		
Baruch Institute (Winyah Bay)	Phragmites	109.00	\$ 19,878.88	\$ 182.38	Habitat	0.375 gal/ac
<b>TOTAL:</b>	(Winyah Phragmites)	109.00	\$ 19,878.88	\$ 182.38		
Belle Isle Bay	Phragmites	4.00	\$ 729.50	\$ 182.38	Habitat	0.375 gal/ac
<b>TOTAL:</b>		4.00	\$ 729.50	\$ 182.38		
Bonneau Ferry Misc Ponds & Reserves	Water Primrose, Water hyacinth, Frog's bit, Lotus, Culgrass.	62.00	\$ 7,955.19	\$ 128.31	Habitat	0.250 - 0.1875 gal/ac
<b>TOTAL:</b>		62.00	\$ 7,955.19	\$ 128.31	Renovate 3	0.750 gal/ac
Cooper River	Hydrilla	49.25	\$ 13,023.20	\$ 264.43	Komeen	16 gal/ac
	Water hyacinth	86.00	\$ 6,910.47	\$ 80.35	Renovate	0.500 gal/ac
<b>TOTAL:</b>		135.25	\$ 19,933.67	\$ 147.38		
Donnelley MMA	Frog's bit, culgrass, primrose, e	39.00	\$ 3,070.61	\$ 78.73	Habitat/Renovate/Clearcast EUP	
<b>TOTAL:</b>		39.00	\$ 3,070.61	\$ 78.73	Habitat-Glyphosate	
Dungannon HP	Water Primrose/Bur Marigold	11.00	\$ 1,122.50	\$ 102.05	Habitat/Glyphosate/Clearcast EUP	0.125/0.625 gal/ac/0.1875 gal/ac
<b>TOTAL:</b>		11.00	\$ 1,122.50	\$ 102.05		
Georgetown Morgan Park	Phragmites	31.00	\$ 5,653.63	\$ 182.38	Habitat	0.375 gal/ac
	Phragmites	14.00	\$ 1,120.00	\$ 80.00	Clearcast EUP	0.500 gal/ac
<b>TOTAL:</b>		45.00	\$ 6,773.63	\$ 150.53		
Goose Creek Reservoir	Water hyacinth	22.00	\$ 2,040.47	\$ 92.75	Renovate 3	0.500 gal/ac
	Water lettuce	136.00	\$ 13,075.27	\$ 96.14	Renovates / Habitat	0.500 gal/ac / 0.250-0.500 gal/ac possible
	Water lettuce	136.00	\$ 12,086.00	\$ 88.50	Reward	0.500 gal/ac
	Culgrass/Water primrose	4.00	\$ 364.75	\$ 91.19	Habitat	0.500 gal/ac
<b>TOTAL:</b>		298.00	\$ 27,516.49	\$ 92.34		
Edisto River	Phragmites	5.00	\$ 746.01	\$ 149.20	Habitat	0.375 gal/ac
<b>TOTAL:</b>		5.00	\$ 746.01	\$ 149.20		
Lake Darpo	Water lily/milfoil	11.00	\$ 2,405.80	\$ 218.71	Navigate/Hardball	200 lbs/ac/5 gal/ac
<b>TOTAL:</b>		11.00	\$ 2,405.80	\$ 218.71		
Lake Greenwood	Hydrilla	25.50	\$ 5,764.00	\$ 226.04	Aquathol-K/Komeen	5 gal/ac/10 gal/ac
	Naiad	34.50	\$ 10,455.00	\$ 303.04	Aquathol-K	3-8 gal/ac
<b>TOTAL:</b>		60.00	\$ 16,219.00	\$ 270.32		
Naval Weapons Station Area 4/Logan/Brown	Phragmites	242.00	\$ 44,134.75	\$ 182.38	Habitat	0.375 gal/ac
Marrington Forest	Frog's bit, culgrass, primrose, alligatorweed	70.00	\$ 9,301.25	\$ 132.88	Habitat/Glyphosate	0.125/0.937 gal/ac
<b>TOTAL:</b>		312.00	\$ 53,436.00	\$ 171.27		
Samnath MMA	Phragmites/Chinaberry	5.00	\$ 911.88	\$ 182.38	Habitat	0.375 gal/ac
<b>TOTAL:</b>		5.00	\$ 911.88	\$ 182.38		
Santee Coastal Reserve	Phragmites	1340.00	\$ 243,154.00	\$ 181.46	Habitat/Clearcast EUP (12 ac.)	.375 gal/ac/0.375 gal/ac
Santee Delta	Phragmites	200.00	\$ 36,475.00	\$ 182.38	Habitat	.375 gal/ac
<b>TOTAL:</b>		200.00	\$ 36,475.00	\$ 182.38		
<b>Santee Cooper Lakes</b>						
Lake Marion	American Lotus, Waterlily, Water Cabomba	53.00	\$ 5,254.90	\$ 99.15	Glyphosate, Renovate	.75 gal/ac, .50 gal/ac
	Coontail	1.50	\$ 523.13	\$ 348.75	Renovate	15 lbs/ac / 20 lbs/ac
	Giant Culgrass, Cattail, Lyngbya, Pinophora	38.00	\$ 5,422.82	\$ 142.71	Habitat / Glyphosate	2.0 gal/ac
	Water Hyacinth	39.00	\$ 6,038.05	\$ 154.82	Culture Ultra	.25 / .50 gal/ac
<b>TOTAL:</b>		202.00	\$ 21,876.98	\$ 108.30	Reward, Renovate	.5 gal/ac, .5 gal/ac

Table 2006-B Summary of S.C. Aquatic Plant Management Control Operations and Expenditures During 2006									
Water Body	Target Plants	Acres	Total Cost	Cost/Acre	Control Agent	Rate	Management Objective	Control Effectiveness	
Lake Moultrie	Water Primrose, Alligatorweed	26.50	\$ 4,113.69	\$ 155.23	Renovate	.50 gal/ac	Reduce non-natives and promote native shoreline plant	~80% control of plant in areas	
	Water Willow	38.50	\$ 8,097.57	\$ 210.33	Renovate	5 - 2.0 gal/ac	Reduce problem plants in residential area where	~20% control of plant in areas	
	Slender Naiad, Pondweed	1.00	\$ 405.20	\$ 405.20	Reward, Curime Ultra	2.0 gal/ac / 4.0 gal/ac	Reduce problem plants in residential area where	>95% control of plant in areas	
	Rush	6.00	\$ 768.01	\$ 128.00	Habitat / Glyphosate	25 / .50 gal/ac	Reduce plant encroachment on waterfowl management	100% control of plant in areas	
	Parrotfeather	2.00	\$ 260.09	\$ 130.05	Renovate	.50 gal/ac	Reduce plant encroachment in SNWR - Bluff Unit ditches	~75% control of plant in areas	
	Duckweed	1.00	\$ 271.82	\$ 271.82	Reward	1.0 gal/ac	Reduce plant population to prevent spread to other	>90% control of plant in areas	
	<b>TOTAL:</b>	<b>414.50</b>	<b>\$ 55,783.61</b>	<b>\$ 134.58</b>					
	American Lotus, Water Lily, Water	49.00	\$ 8,622.21	\$ 173.92	Glyphosate, Renovate	.75 gal/ac, .50 gal/ac	Provide access to open water areas for public use. Restore	>90% control of plant in areas	
	Bladderwort, Pondweed, Slender	0.10	\$ 131.32	\$ 1,313.20	Aquathol Super K Granular	70 lbs/ac	Reduce problem plants in dead-end coves where	~80% control of plant in areas	
	Cabomba, Watermilfoil	5.50	\$ 1,684.40	\$ 306.25	Sonar PR	10 lbs/ac	Reduce problem plants in dead-end coves where	~80% control of plant in areas	
Hydrilla	0.10	\$ 131.32	\$ 1,313.20	Aquathol Super K Granular	70 lbs/ac	Eliminate plant population to prevent spread to other areas	~90% control of plant in areas		
Water Primrose, Alligatorweed	9.00	\$ 1,351.74	\$ 150.19	Renovate	50 gal/acre	Reduce problem plant population to provide public and	~80% control of plant in areas		
Water Willow	0.50	\$ 74.42	\$ 148.84	Habitat / Glyphosate	25 - 375 gal/ac / .50 gal/ac	Reduce problem plant population to provide public and	~20% control of plant in areas		
Giant Cutgrass, Cattail	6.50	\$ 877.75	\$ 135.04	Habitat / Glyphosate	2.5 / .50 gal/ac	Reduce plant encroachment on lake-front property and	>95% control of plant in areas		
<b>TOTAL:</b>	<b>70.70</b>	<b>\$ 9,073.16</b>	<b>\$ 128.33</b>						
Taw Caw Impoundment	Cabomba	3.00	\$ 866.09	\$ 288.36	Sonar Q / PR	11 lbs/ac	Reduce plant population to provide public access to coves	~80% control of plant in areas	
	Hydrilla	144.00	\$ 54,093.24	\$ 375.65	Aquathol K Liquid	6 - 8 gal/ac	Eliminate plant population to provide public access to	<50% reduction of plant biomass	
	Giant Cutgrass, Cattail	2.00	\$ 207.83	\$ 103.92	Habitat, Habitat/Glyphosate,	25 - .375 gal/ac, .125 - .25 / .50	Open areas at head of coves to reduce sediment buildup	>95% control of plant in areas	
	Water Primrose, Alligatorweed	9.00	\$ 858.06	\$ 95.34	Renovate	.50 gal/ac	Reduce problem plant population to provide public and	~85% control of plant in areas	
<b>TOTAL:</b>	<b>158.00</b>	<b>\$ 56,027.22</b>	<b>\$ 354.60</b>						
Potato Creek Impoundment *	Hydrilla	56.00	\$ 25,590.60	\$ 456.98	Aquathol K Liquid	8-10 gal/ac	Remove non-native vegetation and promote native	<50% reduction of plant biomass	
<b>TOTAL:</b>	<b>104.00</b>	<b>\$ 39,998.74</b>	<b>\$ 384.60</b>						
Dean Swamp	Water Primrose, Alligatorweed	6.00	\$ 564.74	\$ 94.12	Renovate	.50 gal/ac	Remove non-native vegetation and promote native	<50% reduction of plant biomass	
	Cabomba	2.00	\$ 534.44	\$ 267.22	Sonar PR / Q	11 lbs/ac	Reduce problem plant population to provide public and	~90% control of plant in areas	
	Lyngbya, Pithophora	22.00	\$ 3,115.02	\$ 141.59	Curime-Ultra	4 - 6 gal/ac	Provide shoreline access	~85% control of plant in areas	
<b>TOTAL:</b>	<b>134.00</b>	<b>\$ 44,212.94</b>	<b>\$ 329.95</b>						
Fountain Lake	Water Primrose, Alligatorweed	1.00	\$ 56.51	\$ 56.51	Renovate	.50 gal/ac	Reduce problem plant population to provide public and	~90% control of plant in areas	
	American Lotus, Fragrant Water	3.00	\$ 169.53	\$ 56.51	Glyphosate, Renovate	.75-1.0 gal/ac, .50 gal/ac	Reduce plant population to provide public access to coves	~80% control of plant in areas	
<b>TOTAL:</b>	<b>4.00</b>	<b>\$ 226.04</b>	<b>\$ 56.51</b>						
Church Branch Impoundment	Water Primrose, Alligatorweed	6.00	\$ 554.47	\$ 92.41	Renovate	.50 gal/ac	Open areas at head of coves to reduce sediment buildup	85% control of plant in areas	
							through increased flow and provide shoreline access.	treated at end of season.	
	Lyngbya, Pithophora	6.50	\$ 1,417.78	\$ 218.12	Curime-Ultra	4 - 6 gal/ac	Eliminate plant population to provide public access to	80% control of plant in areas	
	Cabomba	8.00	\$ 5,943.31	\$ 742.91	Sonar PR / Q	11 lbs/ac	coves and open water areas and remove algal	treated at the end of season	
	Pondweed	10.75	\$ 5,200.88	\$ 483.80	Aquathol K Liquid	5 - 6 gal/ac	Reduce plant population to provide public access to coves	~90% control of plant in areas	
	Water Shield	5.50	\$ 731.26	\$ 132.96	Glyphosate	.75 gal/ac	and open water areas	treated at the end of season	
<b>TOTAL:</b>	<b>36.75</b>	<b>\$ 13,847.70</b>	<b>\$ 376.81</b>						
<b>Santee Cooper Total:</b>	<b>873.95</b>	<b>\$ 204,761.27</b>	<b>\$ 234.29</b>						
SC State Parks	Water Lily	3.00	\$ 1,517.40	\$ 505.80	2, 4-D Granular	200 lbs/ac	Reduce problem plants to enhance public access and use	>95% control of plant in areas	
Barnwell SP	Alligatorweed, Pennywort	0.50	\$ 55.50	\$ 111.00	Renovate	3 qts/ac	Reduce problem plants to enhance public access and use	>95% control of plant in areas	
Charlestowne Landing SP	Duckweed	1.50	\$ 357.37	\$ 238.25	Sonar	1pt/ac	Reduce problem plants to enhance public access and use	treated at end of season	
H Cooper Black	Spatterdock	2.00	\$ 1,011.60	\$ 505.80	Navigate	200 lbs/ac	Reduce problem plants to enhance public access and use	>95% control of plant in areas	
King's Mountain SP	Naiads	4.00	\$ 1,040.00	\$ 260.00	Aquathol K	4 gal/ac	Reduce problem plants to enhance public access and use	>95% control of plant in areas	
Little Pee Dee SP	Water Shield	10.00	\$ 5,056.00	\$ 505.60	2, 4-D Granular	200 lbs/ac	Reduce problem plants to enhance public access and use	>95% control of plant in areas	
Santee SP	Cottail	5.00	\$ 1,170.00	\$ 234.00	Reward	2 gal/ac	Reduce problem plants to enhance public access and use	>95% control of plant in areas	
Sesquecentennial SP	Water Shield	5.00	\$ 2,525.00	\$ 505.00	2, 4-D Granular	200 lbs/ac	Reduce problem plants to enhance public access and use	>95% control of plant in areas	
<b>TOTAL:</b>	<b>31.00</b>	<b>\$ 12,738.87</b>	<b>\$ 410.93</b>						
<b>Santee Cooper Total:</b>	<b>873.95</b>	<b>\$ 204,761.27</b>	<b>\$ 234.29</b>						
<b>STATE PARKS TOTAL</b>	<b>31.00</b>	<b>\$ 12,738.87</b>	<b>\$ 410.93</b>						
<b>GRAND TOTAL</b>	<b>3983.70</b>	<b>\$ 722,316.08</b>	<b>\$ 181.32</b>						

**Table 2007-A. Summary of Expenditures by Source for Control Operations During 2007.**

	Water Body Name	Total Cost	Federal	State	Local	Local Sponsor
1	Back River Reservoir	\$61,116	\$0	\$30,558	\$30,558	SCE&G, CPW
2	Baruch Institute	\$17,388	\$0	\$8,694	\$8,694	Baruch Institute
3	Black River	\$4,815	\$0	\$2,408	\$2,408	Georgetown Co.
4	Black Mingo Creek	\$828	\$0	\$414	\$414	Georgetown Co.
5	Bonneau Ferry	\$5,889	\$0	\$5,889	\$0	SCDNR
6	Caw Caw Natural Area	\$3,477	\$0	\$1,738	\$1,738	Char Co. Parks
7	Combahee River	\$3,272	\$0	\$3,272	\$0	SCDNR
8	Cooper River	\$43,126	\$0	\$21,563	\$21,563	Berkeley Co.
9	Donnelley WMA	\$10,225	\$0	\$5,113	\$5,113	SCDNR
10	Edisto River	\$4,090	\$0	\$4,090	\$0	SCDNR
11	Georgetown Parks	\$366	\$0	\$183	\$183	Georgetown Co.
12	Gibson Pond	\$713	\$0	\$356	\$356	City of Lexington
13	Goose Creek Reservoir	\$27,047	\$0	\$13,524	\$13,524	Charleston CPW
14	Lake Darpo	\$3,111	\$0	\$1,555	\$1,555	Darlington Co.
15	Lake Greenwood	\$36,469	\$0	\$18,235	\$18,235	Greenwood Co.
16	Little Pee Dee River	\$724	\$0	\$724	\$0	SCDNR
17	Pee Dee River	\$818	\$0	\$409	\$409	Georgetown Co.
18	Samworth WMA	\$12,934	\$0	\$6,467	\$6,467	SCDNR
19	Sandy Island	\$134	\$0	\$67	\$67	Georgetown Co.
20	Santee Coastal Reserve	\$123,554	\$0	\$61,777	\$61,777	Santee Coastal Reserve
21	US Army COE	\$117,717	\$117,717	\$0	\$0	Charleston COE
22	US Naval Weapons Sta.	\$37,358	\$37,358	\$0	\$0	US Navy
23	Waccamaw River	\$3,643	\$0	\$1,821	\$1,821	Horry Co., Geo. Co.
24	Yawkey	\$20,865	\$0	\$10,433	\$10,433	Yawkey Foundation
	Santee Cooper Lakes	\$223,666	\$0	\$111,833	\$111,833	
25	Lake Marion	\$122,756	\$0	\$61,378	\$61,378	Santee Cooper
26	Lake Moultrie	\$7,393	\$0	\$3,697	\$3,697	Santee Cooper
	SC State Parks					
27	Barnwell SP	\$704	\$0	\$352	\$352	SCPRT
28	Charlestowne landing	\$403	\$0	\$201	\$201	SCPRT
29	H Cooper Black SP	\$391	\$0	\$196	\$196	SCPRT
30	Huntington Beach SP	\$2,739	\$0	\$1,370	\$1,370	SCPRT
31	King's Mountain SP	\$1,070	\$0	\$535	\$535	SCPRT
32	Little Pee Dee SP	\$1,955	\$0	\$978	\$978	SCPRT
33	NR Goodale SP	\$391	\$0	\$196	\$196	SCPRT
34	Santee SP	\$1,195	\$0	\$598	\$598	SCPRT
35	Sesquicentennial SP	\$978	\$0	\$489	\$489	SCPRT
	<b>SCDNR Total</b>	<b>\$539,678</b>	<b>\$155,075</b>	<b>\$199,289</b>	<b>\$185,314</b>	
	<b>State Park Lake Total</b>	<b>\$9,827</b>	<b>\$0</b>	<b>\$4,913</b>	<b>\$4,913</b>	
	<b>Santee Cooper Total</b>	<b>\$223,666</b>	<b>\$0</b>	<b>\$111,833</b>	<b>\$111,833</b>	
	<b>GRAND TOTALS:</b>	<b>\$773,171</b>	<b>\$155,075</b>	<b>\$316,036</b>	<b>\$302,061</b>	

Table 2007-B Summary of S.C. Aquatic Plant Management Control Operations and Expenditures During 2007									
Water Body	Target Plants	Acres	Total Cost	Cost/Acre	Control Agent	Rate	Management Objective	Control Effectiveness	
Back River Reservoir	Hydrilla	117.63	\$ 35,789.11	\$	304.26 Komcon/Komcon-Reward	16 gal/ae/4 gal/ae-2gal/ae	Reduce problem plants to enhance public access, use, water quality, and maintain electric power generation and minimize impacts to water intakes.	> 95% control. Reward Komcon mix proved to be more effective	
TOTAL:		304.00	\$ 25,327.28	\$	83.31 Renovate/Reward/Clearcast	0.5 - 0.75 gal/ae	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control	
Baruch Institute (Winyah Bay)	Phragmites	100.00	\$ 17,387.50	\$	173.88 Habitat	0.375 gal/ae	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control	
TOTAL:		100.00	\$ 17,387.50	\$	173.88 Habitat	0.375 gal/ae	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control	
Black River	Phragmites	4.00	\$ 674.60	\$	168.65 Habitat	0.375 gal/ae	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control	
TOTAL:		30.00	\$ 4,140.75	\$	138.03 Habitat/Glyphosate	0.375 gal/ae 0.250 gal/ae	Reduce problem plants to enhance waterfowl habitat, public access and use.	90% control	
Black Mingo Creek	Alligatorweed, Pennywort	34.00	\$ 4,815.35	\$	141.63	0.375 gal/ae 0.250 gal/ae	Reduce problem plants to enhance waterfowl habitat, public access and use.	90% control	
TOTAL:		6.00	\$ 828.15	\$	138.03 Habitat/Glyphosate	0.250 - 0.1875 gal/ae	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control	
Bonneau Ferry Misc Ponds & Reserves	Water Primrose, Water hyacinth	53.00	\$ 5,888.75	\$	111.11 Habitat	0.750 gal/ae	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control	
TOTAL:		53.00	\$ 5,888.75	\$	111.11 Habitat	0.500 gal/ae	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control	
Caw Caw Natural Area	Phragmites	17.00	\$ 3,476.50	\$	204.50 Habitat	0.500 gal/ae	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control	
TOTAL:		17.00	\$ 3,476.50	\$	204.50 Habitat	0.500 gal/ae	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control	
Combahee River (Bonnie Hall)	Phragmites	16.00	\$ 3,272.00	\$	204.50 Habitat	0.500 gal/ae	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control	
Cooper River	Hydrilla	16.00	\$ 3,272.00	\$	3,288.00	16 gal/ae	Provide boat trails to main channel through hydrilla. Reduce problem plants to enhance public access and use.	> 95% control	
TOTAL:		31.25	\$ 9,701.26	\$	310.44 Komcon	0.50 gal/ae	Reduce problem plants to enhance waterfowl habitat, public access and use.	> 95% control	
Donnelley WMA	Frogs bit, cutgrass, primrose, a	329.25	\$ 43,126.04	\$	130.98		Reduce problem plants to enhance waterfowl habitat, public access and use.	90% control	
TOTAL:		50.00	\$ 10,225.00	\$	204.50 Habitat/Renovate/Clearcast EUP		Reduce problem plants to enhance waterfowl habitat, public access and use.	90% control	
Edisto River	Phragmites	50.00	\$ 10,225.00	\$	204.50 Habitat	0.375 gal/ae	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control	
TOTAL:		20.00	\$ 4,090.00	\$	204.50 Habitat	0.375 gal/ae	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control	
Georgetown Parks	Phragmites	3.50	\$ 365.81	\$	104.52 Clearcast / Clearcast/Glyphosate	0.375 gal/ae / 0.375 gal/ae/0.375 gal/ae	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control	
TOTAL:		3.50	\$ 365.81	\$	104.52	0.500 gal/ae	Reduce problem plants to enhance public access and use.	90% control	
Gibson Pond	Water primrose, alligatorweed	8.00	\$ 712.92	\$	89.12 Renovate 3	0.500 gal/ae	Reduce water hyacinth & water lettuce to greatest extent possible.	> 95% control	
TOTAL:		8.00	\$ 712.92	\$	89.12	0.500 gal/ae	Reduce problem plants to enhance public access and use.	> 95% control	
Goose Creek Reservoir	Water hyacinth	83.50	\$ 6,779.48	\$	81.19 Renovate3/Clearcast/Reward	0.500 gal/ae	Reduce problem plants to enhance public access and use.	> 95% control	
TOTAL:		155.00	\$ 14,166.20	\$	91.39 Renovate3/Clearcast/Reward	0.500 gal/ae / 0.250+0.500 gal/ae	Reduce problem plants to enhance public access and use.	> 95% control	
Lake Darpo	Water lily/milfoil	15.00	\$ 3,110.70	\$	207.38 Navigate/Hardball	200 lbs/ae/5 gal/ae	Eradicate hydrilla from site	> 90% control of Hydrilla. Note: No Eradication of hydrilla. Hydrilla found @ state mark.	
TOTAL:		104.63	\$ 28,243.18	\$	270.04 Aquathol-k/Komcon	5 gal/ae/10 gal/ae	Reduce problem plants to enhance public access, use and water quality.	> 95% control	
Lake Greenwood	Hydrilla	5.00	\$ 445.58	\$	89.12 Renovate 3	0.500 gal/ae	Reduce problem plants to enhance public access, use and water quality.	> 95% control	
TOTAL:		30.63	\$ 7,770.39	\$	253.73 Aquathol-k	3-8 gal/ae	Reduce problem plants to enhance public access, use and water quality.	> 95% control	
Little Pee Dee River	Water hyacinth	140.25	\$ 36,469.15	\$	260.03	0.500 gal/ae	Reduce problem plants to enhance public access, use and water quality.	< 40% control	
TOTAL:		8.00	\$ 724.00	\$	90.50 Reward	0.500 gal/ae	Reduce problem plants to enhance public access, use and water quality.	> 90% control	
Pee Dee River	Water hyacinth	8.00	\$ 818.25	\$	62.94 Clearcast	0.125 gal/ae	Reduce phragmites to enhance waterfowl habitat, public access and use.	> 95% control	
TOTAL:		13.00	\$ 818.25	\$	62.94	0.375 gal/ae	Reduce phragmites to enhance waterfowl habitat, public access and use.	> 90% control	
Sanworth WMA	Phragmites	9.00	\$ 1,566.10	\$	174.01 Habitat	0.1875 gal/ae	Reduce phragmites to enhance waterfowl habitat, public access and use.	> 90% control	
TOTAL:		99.00	\$ 11,367.75	\$	114.83 Clearcast	0.1875 gal/ae	Reduce phragmites to enhance waterfowl habitat, public access and use.	> 90% control	
TOTAL:		108.00	\$ 12,933.85	\$	119.76				





**Table 2008-A. Summary of Expenditures by Source for Control Operations During 2008.**

	Water Body Name	Total Cost	Local	State	Federal	Local Sponsor
1	ACE Basin	\$1,510	\$755	\$755	\$0	USF&W
2	Back River Reservoir	\$68,783	\$34,391	\$34,391	\$0	SCE&G, CPW
3	Baruch	\$9,396	\$4,698	\$4,698	\$0	Baruch
4	Black Mingo Creek	\$184	\$92	\$92	\$0	Georgetown Co.
5	Black River	\$551	\$276	\$276	\$0	Georgetown Co.
6	Bonneau Ferry WMA	\$6,293	\$772	\$5,520	\$0	SCDNR
7	Boyd Pond	\$2,450	\$1,225	\$1,225	\$0	Aiken County
8	Cape Island	\$2,565	\$1,283	\$1,283	\$0	USF&W
9	Caw Caw Park	\$767	\$383	\$383	\$0	Charleston Parks
10	City of Aiken	\$84	\$42	\$42	\$0	City of Aiken
11	Cooper River	\$38,985	\$19,492	\$19,492	\$0	Berkeley Co.
12	Dungannon WMA	\$686	\$343	\$343	\$0	SCDNR, USF&W
13	Georgetown Parks	\$8,271	\$3,725	\$4,546	\$0	Georgetown Co.
14	Goose Creek Reservoir	\$32,213	\$16,106	\$16,106	\$0	CPW
15	Horry County	\$3,671	\$0	\$3,671	\$0	SCDNR
16	Lake Cunningham	\$7,700	\$3,850	\$3,850	\$0	Greer CPW
17	Lake Greenwood	\$49,073	\$24,537	\$24,537	\$0	Greenwood Co.
18	Lake Murray	\$0	\$0	\$0	\$0	SCE&G, Lexington Co.
19	Little Pee Dee River	\$224	\$112	\$112	\$0	Horry Co.
20	Pee Dee River	\$303	\$152	\$152	\$0	Georgetown Co.
21	Samworth WMA	\$11,528	\$5,764	\$5,764	\$0	SCDNR
22	Santee Coastal Reserve	\$60,400	\$24,160	\$36,240	\$0	SCDNR
23	Santee Delta WMA	\$9,396	\$4,698	\$4,698	\$0	SCDNR
24	US Naval Weapons Sta.	\$16,386	\$0	\$16,386	\$0	US Navy
25	Waccamaw River	\$6,142	\$1,558	\$4,584	\$0	USF&W
	<b>State Parks</b>					
26	Barnwell SP	\$1,005	\$503	\$503	\$0	SCPRT
27	Charlestown Landing SP	\$87	\$43	\$43	\$0	SCPRT
28	Cheraw SP	\$804	\$402	\$402	\$0	SCPRT
29	Goodale SP	\$402	\$201	\$201	\$0	SCPRT
30	H Cooper Black SP	\$201	\$101	\$101	\$0	SCPRT
31	Huntington Beach SP	\$32	\$0	\$32	\$0	SCPRT
32	Kings Mountain SP	\$1,120	\$560	\$560	\$0	SCPRT
33	Little Pee Dee SP	\$2,010	\$1,005	\$1,005	\$0	SCPRT
34	Poinsette SP	\$1,005	\$503	\$503	\$0	SCPRT
35	Sesquicentennial SP	\$1,039	\$402	\$637	\$0	SCPRT
	<b>Santee Cooper Lakes</b>		\$30,868	\$30,868		
36	Lake Marion	\$61,737				Santee Cooper
37	Lake Moultrie	\$7,927	\$3,963	\$3,963		Santee Cooper
	<b>Sub Impondments</b>	\$225,768	\$118,099	\$107,668		Santee Cooper
	<b>SCDNR Total</b>	\$337,557	\$148,413	\$189,144	\$0	
	<b>State Park Lake Total</b>	\$7,705	\$3,719	\$3,986	\$0	
	<b>Santee Cooper Total</b>	\$295,431	\$152,931	\$142,500	\$0	
	<b>Grand Total</b>	\$640,693	\$305,063	\$335,630	\$0	

Table 2008-B Summary of S. C. Aquatic Plant Management Control Operations and Expenditures During 2008									
Waterbody	Target/Plants	Acres	Total Cost	Cost/Acre	Control/Agent	Rate	Management/Objective	Control/Effectiveness	
Waterbody	Phragmites	10.00	\$1,510.00	\$151.00	Habitat	0.500 galloc	Reduce phragmites to enhance waterfowl habitat, public access and use.	> 95% control	
Back River Reservoir	TOTAL:	10.00	\$1,510.00	\$151.00					
	Hydrilla	149.69	\$46,590.63	\$311.25	Komeen/Komeen-Reward	16 galloc/4 galloc-2galloc	Reduce problem plants to enhance public access, use, water quality, and maintain electric power generation and minimize impacts to water intakes.	> 95% control	Reward/Komeen mix proved to be more effective
	Water hyacinth	263.50	\$20,277.18	\$79.99	Renovate/Reward/Clearcast/Habitat	0.250 - 0.500 galloc		90% control	
	Water primrose	24.00	\$1,914.79	\$79.78	Renovate/Habitat	0.250 - 0.500 galloc		90% control	
	TOTAL:	427.19	\$68,782.60	\$161.01					
Baruch Institute	Phragmites	70.00	\$9,395.50	\$134.22	Habitat	0.375 galloc	Reduce phragmites to enhance waterfowl habitat, public access and use.	>90% control	
	TOTAL:	70.00	\$9,395.50	\$134.22					
Black River	Alligatorweed, Pennywort	6.00	\$51.25	\$91.88	Renovate	0.500 galloc	Reduce problem plants to enhance waterfowl habitat, public access and use.	> 95% control	
	TOTAL:	6.00	\$51.25	\$91.88					
Black Mingo Creek	Alligatorweed, Pennywort	2.00	\$183.75	\$91.88	Renovate	0.500 galloc	Reduce problem plants to enhance waterfowl habitat, public access and use.	> 95% control	
	TOTAL:	2.00	\$183.75	\$91.88					
Bonneau Ferry Misc Ponds & Reserves	Water Primrose, Water hyacinth, Frog's bit, Lotus, Cutgrass,	54.00	\$6,292.50	\$116.53	Habitat/Clearcast Hardball	0.250 - 0.375 galloc 3 galloc - 5galloc	Reduce problem plants to enhance waterfowl habitat, public access and use.	>90% control	
	TOTAL:	54.00	\$6,292.50	\$116.53					
Boyd Pond	Watermilfoil	12.00	\$2,412.00	\$201.00	Hardball	5 galloc	Reduce problem plants to enhance waterfowl habitat, public access and use.	>90% control	
	Water primrose	0.50	\$37.88	\$75.76	Habitat	0.250 galloc		>90% control	
	TOTAL:	12.50	\$2,449.88	\$196.99					
Cape Island	Phragmites	15.00	\$2,565.00	\$171.00	Clearcast	0.500 galloc	Reduce phragmites to enhance waterfowl habitat, public access and use.	> 95% control	
	TOTAL:	15.00	\$2,565.00	\$171.00					
Caw Caw Natural Area	Phragmites	7.00	\$768.50	\$109.80	Habitat	0.500 galloc	Reduce phragmites to enhance waterfowl habitat, public access and use.	>90% control	
	TOTAL:	7.00	\$768.50	\$109.80					
City of Aiken - Hopeland	Microcystis (toxic algae)	2.00	\$84.00	\$42.00	Green Clean	7.5 galloc	Reduce toxic algae concentration for public health reasons	> 95% control	
	TOTAL:	2.00	\$84.00	\$42.00					
Cooper River	Hydrilla	36.25	\$11,612.80	\$320.35	Komeen/Aquathol	16 galloc/5 galloc	Provide boat trails to main channel through hydrilla. Reduce problem plants to enhance public access and use.	> 95% control	
	Water hyacinth	283.00	\$27,371.75	\$96.72	Renovate/Habitat/Clearcast/Reward	0.250 galloc-0.750 galloc		> 95% control	
	TOTAL:	319.25	\$38,984.55	\$122.11					
Dungannon	Frog's bit, Cutgrass, water primrose, Alligatorweed	8.00	\$686.00	\$86.75	Clearcast	0.250 galloc	Reduce problem plants to enhance waterfowl habitat, public access and use.	90% control	
	TOTAL:	8.00	\$686.00	\$86.75					
Georgetown Parks	Phragmites	51.25	\$8,270.63	\$161.38	Clearcast	0.500 galloc	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control	
	TOTAL:	51.25	\$8,270.63	\$161.38					
Goose Creek Reservoir	Water hyacinth	48.00	\$4,036.25	\$84.09	Renovate/Clearcast/Reward	0.250 galloc-0.500 galloc	Reduce water hyacinth & water lettuce to greatest extent possible.	> 95% control	
	Water lettuce	75.00	\$7,576.05	\$101.01	Renovate/Clearcast/Reward/Galleon	0.1875 galloc-0.500 galloc		> 95% control	
	Duckweed	49.00	\$14,563.67	\$297.22	Reward/Sonar	0.5 galloc / 0.125 galloc	Reduce problem plants to enhance public access, use and water quality.	> 95% control	
	Cabomba	4.30	\$657.60	\$152.93	Hardball	3 galloc-5 galloc		90% control	
	Cutgrass/Water primrose	6.00	\$454.50	\$75.75	Habitat	0.5 galloc		90% control	
	Hydrilla	2.00	\$976.50	\$488.25	Aquathol K	2.5 galloc		> 95% control	
	Hydrilla/Phitophera	22.50	\$3,945.20	\$175.48	Captain	4galloc-12 galloc		> 95% control	
	TOTAL:	206.80	\$32,212.77	\$156.77					
Horry County	Island Applesnails	110.50	\$3,670.50	\$33.22	Copper	5 ppm	Eradicate or reduce problematic snail populations to protect human health and sensitive areas	>60% control	
	TOTAL:	110.50	\$3,670.50	\$33.22					
Lake Cunningham	Brazilian Elodea	32.00	\$7,472.64	\$233.52	Nautique	7 galloc	Reduce problem plants to enhance public access, use and water quality.	90% control	
	Water lily	3.00	\$227.25	\$75.75	Habitat	0.250 galloc		90% control	
	TOTAL:	35.00	\$7,699.89	\$220.00					
Lake Greenwood	Hydrilla	236.00	\$41,133.58	\$174.23	Sonar/Aquathol-K/Nautique	4 galloc-10 galloc 10 lbs/ac	Eradicate hydrilla from site.	> 90% control of Hydrilla. Note: No Eradication of hydrilla. Hydrilla found @ state park	
	Naiad	34.00	\$7,939.68	\$233.52	Nautique	7 galloc	Reduce problem plants to enhance public access, use and water quality.	> 95% control	
	TOTAL:	270.00	\$49,073.26	\$181.75					
Little Pee Dee River	Water hyacinth	3.00	\$74.67	\$24.89	Clearcast	0.187 galloc	Reduce problem plants to enhance public access, use and water quality.	> 95% control	
	TOTAL:	3.00	\$74.67	\$24.89					
Naval Weapons Station	Phragmites	115.00	\$16,386.25	\$142.48	Habitat/Clearcast	0.250 galloc-0.500 galloc	Reduce phragmites to enhance waterfowl habitat, public access and use.	> 95% control	
	TOTAL:	115.00	\$16,386.25	\$142.48					

Table 2008-B Summary of S. C. Aquatic Plant Management Control Operations and Expenditures During 2008									
Waterbody	Target/Plants	Acres	Total Cost	Cost/acre	Control Agent	Rate	Management Objective	Control Effectiveness	
Pee Dee River	Water hyacinth	4.00	\$303.00	\$75.75	Habitat	0.500 gall/ac	Reduce problem plants to enhance public access, use and water quality.	> 95% control	
Samworth WMA	TOTAL:	4.00	\$303.00	\$75.75					
	Phragmites	10.00	\$1,348.00	\$134.80	Habitat	0.375 gall/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control	
Santee Coastal Reserve	Water hyacinth	80.00	\$10,180.00	\$127.25	Clearcast	0.250 gall/ac	Reduce hyacinth to minimize spread and impacts to public access and use.	90% control	
	TOTAL:	90.00	\$11,528.00	\$128.09		0.500 gall/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control	
Santee Delta WMA	Phragmites	400.00	\$60,400.00	\$151.00	Habitat		Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control	
	TOTAL:	400.00	\$60,400.00	\$151.00					
Waccamaw River	Phragmites	70.00	\$9,395.50	\$134.22	Habitat	0.375 gall/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control	
	TOTAL:	70.00	\$9,395.50	\$134.22					
Santee Cooper Lakes	Water hyacinth	77.75	\$6,141.90	\$79.00	Habitat/Reward	0.250 gall/ac/0.500 gall/ac	Reduce hyacinth to minimize spread and impacts to public access and use.		
	TOTAL:	77.75	\$6,141.90	\$79.00					
Lake Marion	Crested Floating Heart	85.0	\$34,885.00	\$408.06	Aquathol K Liquid	4.0 - 6.5 gall/ac	Provide access to open water and shoreline areas for public use and prevent spread to other areas of the lake	>90% in shallow coves, < 20% in open water areas	
	Giant Cutgrass, Cattail	129.5	\$16,946.94	\$130.86	Habitat / Touchdown	0.25/0.50 gall/ac	Reduce plant encroachment on lake-front property and public access areas. Restoration of waterfowl habitat.	TBD due to late fall treatment	
Lake Moultrie	Various Brush	2.5	\$309.39	\$123.76	Touchdown	1.0 gall/ac	Remove plant biomass to allow promote unrestricted water flow in waterfowl pond feedwater ditches	100% control at end of season	
	Lyngbya, Pithophora	7.0	\$1,235.48	\$176.50	Cutrine Ultra	4 - 6 gall/ac	Reduce algal mats to enhance recreational use of water and reduce interference with agricultural irrigation intakes.	85% control of plant at end of season (St. Julien S/D cove de-watered most of season due to drought)	
Lake Moultrie	Water Primrose, Alligatorweed	37.9	\$6,353.08	\$167.63	Renovate	0.50 gall/ac	Reduce shoreline plant populations to enhance recreation and navigation	>95% control of plant at end of season. Some late season growth noted.	
	Water Willow	11.5	\$2,144.77	\$186.50	Renovate	2.0 gall/ac	Reduce problem plants in residential area where navigation and recreation are adversely affected.	~75% control of plant at end of season	
Lake Moultrie	Taro	0.5	\$61.88	\$123.76	Touchdown	1.0 gall/ac	Remove plant biomass to allow promote unrestricted water flow in waterfowl pond feedwater ditches	100% control at end of season	
	TOTAL:	274	\$61,736.54	\$225.40		1.0 gall/ac	Reduce problem plants in residential area where recreation are adversely affected.	>95% control of plant at end of season	
Lake Moultrie	American Lotus	3.5	\$375.15	\$107.19	Touchdown	1.0 gall/ac	Reduce problem plants in residential area where recreation are adversely affected.	>95% control of plant at end of season	
	Fragrant Water Lily	1.8	\$198.04	\$110.02	Touchdown	1.0 gall/ac	Reduce problem plants in residential area where recreation are adversely affected.	>95% control of plant at end of season	
Lake Moultrie	Crested Floating Heart	5.4	\$2,304.89	\$426.83	Aquathol K Liquid	6.5 gall/ac	Remove problem plants adjacent to boat landing to prevent spread to other areas of lake	>95% control of plant at end of season (in canal area only)	
	Hydrilla	0.5	\$196.34	\$392.68	Aquathol Super K Granular	10 lbs/ac ft	Eliminate plant population at residential area to prevent spread to other areas of lake and other water bodies.	90% control of plant after treatment; area now de-watered	
Lake Moultrie	Lyngbya, Pithophora	0.5	\$30.95	\$61.90	Cutrine Ultra	4.0 gall/ac	Reduce algal mats in dead-end coves where navigation and recreation are adversely affected.	85% control of plant after treatment; area now de-watered	
	Water Primrose, Alligatorweed	27.8	\$4,351.58	\$156.53	Renovate	0.50 gall/ac	Reduce problem plants in residential area where recreation is adversely affected.	>95% control of plant at end of season; some late season growth noted	
Lake Moultrie	Milfoil	1.5	\$259.60	\$173.07	Renovate	4.0 - 5.0 gall/ac	Reduce problem plants in residential area where recreation is adversely affected.	100% control after treatment; area now de-watered	
	Bladderwort	1.0	\$210.17	\$210.17	Reward	2.0 gall/ac	Reduce problem plants in residential area where recreation is adversely affected.	90% control of plant after treatment; area now de-watered	
Law Law Impoundment	TOTAL:	42	\$7,926.72	\$188.73		1.0 - 2.2	Reduce plant population to provide public access to shoreline, coves and open water areas and prevent spread of plant to other areas of the lake	~75% control of plant in areas treated at the end of season	
	Hydrilla	175.0	\$91,542.49	\$523.10	Aquathol K Liquid Ultra	6 - 8 gall/ac	Reduce problem plant population to provide public and shoreline access	>95% control of plant in areas treated at end of season	
Law Law Impoundment	Water Primrose, Alligatorweed	14.0	\$1,273.89	\$90.99	Renovate	.50 gall/ac	Eliminate plant population to provide public access to coves and open water areas and prevent spread to other areas of lake	<50% reduction of plant biomass in areas treated at the end of season	
	Pondweed	0.0	\$0.00	#DIV/0!	Aquathol K Liquid	5 - 6 gall/ac	Remove plant to improve access and use of water for property owners and public.	<50% control of plant at the end of the season	
Law Law Impoundment	Duckweed	0.0	\$0.00	#DIV/0!	Reward	1.0 gall/ac	Remove plant to improve access and use of water for property owners and public.	<50% control of plant at the end of the season	
	Total:	189.0	\$82,816.38	\$491.09					

Table 2008-B Summary of S. C. Aquatic Plant Management Control Operations and Expenditures During 2008									
Waterbody	Target/Plants	Acres	Total Cost	Cost/Acre	Control/Agent	Rate	Management/Objective	Control/Effectiveness	
<u>Potato Creek Impoundment</u>	Hydrilla	120.0	\$41,126.54	\$342.72	Sonar AS Sonar Q Sonar PR	.025 gal/ac 3.0 - 4.0 lbs/ac	Remove non-native vegetation and promote native vegetation dominance as per Santee Cooper / SCDNR agreement	>95% control of plant over entire impoundment at end of season	
	American Lotus	14.0	\$1,349.88	\$96.42	Renovate	.50 gal/ac	Reduce plant population to provide public access and promote growth of beneficial vegetation	>95% control of plant in areas treated at end of season	
	<b>Total:</b>	<b>134.0</b>	<b>\$42,476.42</b>	<b>\$316.99</b>					
<u>Dean Swamp Impoundment</u>	Hydrilla	112.0	\$41,560.48	\$371.08	Sonar AS Sonar Q Sonar PR	.025 gal/ac 3.0 - 4.0 lbs/ac	Remove non-native vegetation and promote native vegetation dominance as per Santee Cooper / SCDNR agreement	>95% control of plant over entire impoundment at end of season	
	Water Primrose, Alligatorweed	5.0	\$780.85	\$156.17	Renovate	.50 gal/ac	Reduce problem plant population to provide public and shoreline access	~90% control of plant in areas treated at end of season	
	Lyngbya, Pithophora	56.0	\$7,122.06	\$127.18	Cutlime-Ultra	5.0 gal/ac	Reduce algal mats to enhance recreational use of water	~85% control of plant in areas treated at the end of season.	
	<b>Total:</b>	<b>173.0</b>	<b>\$49,463.39</b>	<b>\$285.92</b>					
<u>Fountain Lake Impoundment</u>	Water Primrose, Alligatorweed	2.0	\$196.99	\$98.50	Touchdown Pro	1.0 gal/ac	Reduce problem plant population to provide public and shoreline access	~85% control of plant in areas treated at the end of season.	
	Fragrant Water Lily	3.0	\$342.13	\$114.04	Touchdown Pro	1.0 gal/ac	Reduce problem plant population to provide public and shoreline access	~90% control of plant in areas treated at the end of season.	
	<b>Total:</b>	<b>5.0</b>	<b>\$539.12</b>	<b>\$107.82</b>					
<u>Church Branch Impoundment</u>	Hydrilla	2.0	\$880.21	\$440.11	Aquathol K Liquid	7.0 gal/ac	Reduce plant population to provide public access to coves and open water areas and prevent spread to other areas of the lake	~90% control of plant in treated area at the end of season	
	Water Primrose, Alligatorweed	7.5	\$815.54	\$108.74	Renovate	0.50 gal/ac	Reduce plant population to provide shoreline access and public access to coves and open water areas	~80% control of plant in treated area at the end of season	
	Lyngbya, Pithophora	0.4	\$199.10	\$497.75	Cutlime-Ultra	4.0 gal/ac	Eliminate plant population to provide residential shoreline access and remove algal accumulation from submersed vegetation prior to treatment	~90% control of plant in treated area at the end of season	
	American Lotus	0.5	\$44.74	\$89.48	Touchdown Pro	1.0 gal/ac	Reduce plant population to provide residential and public access to open water areas	~90% control of plant in treated area at the end of season	
	Coontail	0.1	\$49.78	\$497.80	Reward Cutlime Ultra	2.0 gal/ac	Reduce plant population to provide residential access	~100% control of plant in treated area at the end of season	
	Pondweed	70.0	\$29,488.08	\$421.26	Aquathol K Liquid	7.0 gal/ac	Reduce plant population to provide residential access and public access to coves and open water areas	~90% control of plant in treated area at the end of season	
	Slender Naiad	23.0	\$9,035.04	\$392.83	Aquathol K Liquid	7.0 gal/ac	Reduce plant population to provide residential access and public access to coves and open water areas	~90% control of plant in treated area at the end of season	
	<b>Total:</b>	<b>103.5</b>	<b>\$40,472.49</b>	<b>\$391.04</b>					
	<b>Santee Cooper TOTAL:</b>	<b>920.40</b>	<b>\$285,431.06</b>	<b>\$320.98</b>					
<u>SC State Parks</u>									
<u>Barnwell</u>	Water lily	5.00	\$1,005.00	\$201.00	Hardball	5 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control	
	Pennywort	0.50	\$86.63	\$173.26	Clearcast	0.750 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control	
<u>Charlestown Landing</u>	Watershield, milfoil	4.00	\$804.00	\$201.00	Hardball	5 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control	
	Water lily	2.00	\$402.00	\$201.00	Hardball	5 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control	
<u>H Cooper Black</u>	Spatterdock	1.00	\$201.00	\$201.00	Hardball	5 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control	
<u>Huntington Beach</u>	Phragmites	0.250	\$32.38	\$129.52	Clearcast	0.500 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control	
<u>Kings Mountain</u>	Naiads	4.00	\$1,120.00	\$280.00	Aquathol K	4 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control	
<u>Little Pee Dee</u>	Yellow cowley	10.00	\$2,010.00	\$201.00	Hardball	5 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control	
<u>Poinsette</u>	Spatterdock	5.00	\$1,005.00	\$201.00	Hardball	5 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control	
<u>Seesquecentennial</u>	Water lily	4.00	\$804.00	\$201.00	Hardball	5 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control	
<u>Seesquecentennial</u>	Water lily	1.00	\$234.75	\$234.75	Hardball/Habitat	5 gal/ac 0.250 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control	
	<b>TOTAL:</b>	<b>36.75</b>	<b>\$7,704.76</b>	<b>\$209.65</b>					
	<b>SCDNR TOTAL</b>	<b>2366.24</b>	<b>\$337,557.23</b>	<b>\$142.66</b>					
	<b>Santee Cooper TOTAL</b>	<b>920.40</b>	<b>\$285,431.06</b>	<b>\$320.98</b>					
	<b>STATE PARKS TOTAL</b>	<b>36.75</b>	<b>\$7,704.76</b>	<b>\$209.65</b>					
	<b>GRAND TOTAL</b>	<b>3323.39</b>	<b>\$640,693.05</b>	<b>\$192.78</b>					

## **APPENDIX G**

### **Summary of Public Comments, Responses, and Plan Modifications to the Draft South Carolina Aquatic Plant Management Plan**

## **Summary of Public Comments, Responses, and Plan Modifications to the Draft 2009 South Carolina Aquatic Plant Management Plan**

### **Santee Cooper Lakes:**

**Commenters:** David E. Sweat, Philomena A Volpe

### **Comments:**

I along with several others are in agreement with the invasive weeds being sprayed in the Lakes, however we are concerned about several issues that we feel are not being considered. Most of these issues are from anglers and guides! (Sweat)

The time frame for spraying is proposed during the spawning periods for fish, almost all fish in the lakes will be spawning and in the shallow areas to be sprayed. (Sweat)

By spraying the baby leaves, or non-permanent leaves the plant species will not be killed. Thus spending money wastefully and having to repeat the spray. By repeating, the poison levels will be higher causing fish to die. (Sweat)

Certainty of poison's used vs. eco-system damage is not known. How will it effect the shell fish in the lakes? Will rain and rain run-off's dilute the formula used, or will the formula dissipate when subjected to large quantities of water (remember the Lake waters are used for drinking purposes). (Sweat)

Another concern is Grass being engulfed in the turbines, once the spray does the job on the plant, the plant will die off, breaking off and have a larger chance of being engulfed in the turbines, how is this going to be resolved? (Sweat)

Remember if it can travel down stream, it will also travel out the locks into the ocean, so if the toxin used or the plant survives down stream, now the plant is given an opportunity to spread to other areas. (Sweat)

I see no action taken for the Lizzie Creek area. In the last two years, I'm assuming because of the drought we have had a severe problem with invasive weeds in our area. You could not maneuver your boat 50 yds without stopping to get the hydilla off the motor. Due to the water levels both high grass weeds and hydrilla have been out of control since at least March of 2008. The motoring up our canal to the Wyboo area is dangerous as it is with the stumps, the weeds only add to dangers. If you could please consider our Lizzie Creek Area in your controlled plan it would be greatly appreciated. (Volpe)

**Response:**

The Draft 2009 Aquatic Plant Management Plan proposes a maintenance stocking of sterile grass carp in the Santee Cooper Lakes in 2009. The Aquatic Plant Management Council is committed to maintenance stocking of triploid grass carp in the Santee Cooper Lakes to provide long-term control of hydrilla and to help alleviate the need for extensive herbicide treatments for hydrilla control. Most spawning activities are in the early spring before most herbicide treatments occur. All of the herbicide used in any reservoirs or lakes is labeled for use in South Carolina waters by both the U.S. Environmental Protection Agency and Clemson's Department of Pesticide Regulation only after extensive assessments have been completed. They are applied by licensed professionals with great care not to exceed the limits of the label. EPA registration of pesticides intends to promote the safety and well-being of public health and the ecosystem. More specifically, each year a letter is sent to SCDHEC, Bureau of Water which oversees drinking water supplies in SC outlining the specific use of these herbicides and includes detailed planned treatment precautions even though all treatments are a significant distance away from any potable water intakes.

Most of the shellfish you refer to in the Santee Cooper Lakes is itself an invasive species. *Cobricula fluminea*, Asian clams, have become the dominant freshwater mollusk. We are not sure of the overall ecological impact of these clams in South Carolina waters and most are only affected by significant concentrations of chlorine or bromine in the water column. Aquatic herbicides also are very soluble in water, disperse readily to very low level concentrations, and have a very short lived half life.

Lizzy Creek is not a sub-impoundment but a cove off of Wyboo embayment on Lake Marion. The plant that you are referring to is water primrose not hydrilla. Santee Cooper has it in their plans to treat that area this year as soon as the plant is at the proper growth stage.

**Plan Modifications:**

None at present.

**Summary of Public Comments, Responses, and Plan Modifications to the Draft 2008 South Carolina Aquatic Plant Management Plan****Lake Murray:**

**Commenters:** Grayson Mathis

**Comments:**

Why is the state pouring more money into fighting the "weed" problem? Is it because of pleasure boaters and jet skiers who are too lazy to go around the weeds? Why does the DNR constantly

comply with whatever these well-to-do people want, rather than focus on what is best for the NATURAL RESOURCES. Look at the state of Georgia, they are not killing off their fisheries by taking out the weeds. Since you have killed the hydrilla in Lake Murray, the fishing is getting worse. Tournament weights are down, considerably. This is a major problem since fishing is a large, large portion of the attractiveness of the Lake Murray region. I just don't understand why the DNR continuously pursues these pork belly projects to make a few people happy. You should be focusing on what your job title is, dealing with natural resources, not destroying them because those with money want.

**Response:**

The budget for 2008 of \$760,000 is lower than the average cost in the 90's of 1.484 million dollars spent per year. The budget has decreased in part because early detection and proactive management techniques have kept invasive species in check. Municipal water intakes, recreational activities, hunting, fishing and various other water uses are affected by invasive species in South Carolina. The Aquatic Plant Management Program tries to take into account all of the varied uses of our waterways when determining management methods. In all cases an integrated, balanced management approach is used to minimize impact to the habitat of South Carolina waters while aggressively pursuing control of any federally and state listed invasive species.

There is no plan to stock grass carp in 2008 for Lake Murray and only a limited number of acres in the plan for primrose control. A late fall survey showed no appreciable hydrilla, so a dramatic increase in that acreage would have to occur to even consider stocking more carp. The information in the 2008 plan pertaining to triploid grass carp stockings for hydrilla control is part of an early detection, rapid response protocol for long term control of hydrilla in Lake Murray.

The state of Georgia does indeed use and recommend aquatic weed control methods using triploid grass carp in several lakes. Georgia has also recently created the Georgia Exotic Pest Plant Council in response to increasing awareness of non-native invasive species. Hydrilla is listed as one of their most problematic invasive weeds.

Tournament weights were up in the last major tournaments held at Lake Murray. There were four new records set at the February 2006 FLW tour event held on Lake Murray which occurred after the 2003 stocking. Inspection of BASS events from 1991 to 2006 on Lake Murray has shown that the tournament weights appear to have remained fairly constant. In addition, SCDNR Fisheries biologists have stated that Lake Murray was at or above average when looking at the condition factors for largemouth bass, their population numbers were at favorable levels as well and the overall health of the system is good for a large impoundment with other fish species also having healthy populations represented.

**Plan Modifications:**

None at present

## **Summary of Public Comments, Responses, and Plan Modifications to the Draft 2007 South Carolina Aquatic Plant Management Plan**

### **Santee Cooper Lakes:**

**Commenters:** Hunter Suggs, Rep. Phillip Lowe

### **Comments:**

"I am in complete opposition to releasing any additional carp into the Santee cooper Lakes. Ever since the original stocking occurred, ALL of the native and non-native grasses and vegetation disappeared, and the Upper End of Lake Marion has become a mud hole. The ducks that used to winter in this area do not visit "The Swamp" anymore. Please do not release any additional carp into the Santee Cooper Lake System." (Suggs)

"Aquatics do not currently pose a problem. Your previous overstocking hurt waterfowling and fishing. You have proved you can stock enough to control vegetation. The vegetation you state has recovered is not hydrillLet more vegetation return. Do not restock yet!!!" (Lowe)

### **Response:**

The original grass carp stocking between 1989 and 1996 added over 760,000 sterile grass carp to Lakes Marion and Moultrie. That amount was needed to control the 48,000 acres of hydrilla that was present at the time. That multi-year stocking was successful, but after hydrilla was controlled the fish also impacted desirable native vegetation. That was ten years ago and since then the number of grass carp have declined to about 5,800 fish and beneficial vegetation has come back. Native vegetation has shown a 60% increase in acreage from 2005 to 2006 for a total of 12,960 vegetated acres. Total vegetative coverage now is conservatively estimated at 3 % in Lake Marion and 2% in Lake Moultrie based on annual aerial surveys and photography. Some hydrilla is beginning to return in the main lakes. To avoid the occurrence of widespread hydrilla infestations again in the Santee Cooper Lakes, a small maintenance stocking of sterile grass carp is needed. The maintenance stocking plan calls for adding a small number of grass carp to the system to equal the number present at the beginning of 2006 when hydrilla was under control yet native species were present (8,200 fish). That additional number is 2,100 fish in Lake Marion and 520 in Lake Moultrie. This is a very small number of grass carp for a lake system that is over 170,000 acres in size and about one percent of the original stocking. The proposed stocking plan was reviewed and approved by DNR fisheries and waterfowl biologists to help ensure the protection of fish and wildlife populations. In addition to the maintenance stocking; the plan calls for efforts to increase habitat by promoting vegetation beneficial to wildlife and waterfowl through other habitat enhancement projects. Those efforts include the planting of desirable native plant species, improvements to the current WMAs, and additional support for the Santee National Wildlife Refuge.

**Plan Modifications:**

None at present.

**East Branch of the Cooper River:**

**Commenters:** Tommy Kellum

**Comments:**

“My concern is the East Branch of the Cooper River and the adjoining rice fields and French Quarter, Quemby, and Huger Creeks. I reviewed your Management Plan Draft and it stated that the coverage was approximately 3000 acres. If this is referring to weed coverage it is highly under estimated. I live on French Quarter Creek and I see air boats spraying approximately every other year. The weeds are closing off virtually all adjoining creeks and rice fields. It appears that after the weeds gain control then silt fills the creeks even further. Your draft mentions the use of carp in the Santee cooper lakes as one method of control. What other options are there for the creeks besides spraying? If there is none, what would be the effects of spraying more often? Recreational use is on the rise and our useable water area has greatly been reduced over the past ten years.” (Kellum)

**Response:**

The main aquatic weed problem in the creeks you refer to is the growth of water primrose and water hyacinth. Neither of these plants can be controlled by grass carp. Other biological controls are available for water hyacinth but have not been successful in this part of the country. So there aren't many options for the creeks along the Cooper River except for herbicide application. In trying to manage a complete system, one must start small by treating the main channels and creeks most used by the public. After a certain level of control is established then efforts can expand to include the smaller creeks. Timing, water levels, and available funding play a crucial part in all control efforts. Additional herbicide treatments are possible if additional federal, state or local funding were available. We are committed to a systematic approach where control efforts are focused on the areas of greatest public use first then expanded into adjoining creeks where public use is less.

**Plan Modifications:** None at present.

**Summary of Public Comments, Responses, and Plan Modifications to the Draft 2006 South Carolina Aquatic Plant Management Plan**

Note: All comments received refer to Lake Murray. No other comments were received.

**Lake Murray:**

**Commenters:** Sam Gustafson, George King, Roy Parker, Herlong (cherlong@greenwood.net), John & Heide Hoppe, Robert Shealy Jr., Robert King, Roger Becker, Julius Bell, Billy F. Peake, E. Gobbel, Mr.

& Mrs. Henry Blakewood, Mary Autrey, Martin Blackford, Charles F. Noll Jr., David McElyea, Don & Deloris Rains, Michelle Elles, Jimmy & Cathy Woods, Harvey Cubb, Robert Rucker, Bernard H. Long, Hans N. Fagg, Tom & June Schmitt, Benji & Joe Barnhill.

**Comments:**

300 acres...that's real impressive. As I recall prior to the carp the coverage on Lake Murray was several thousand acres. Congratulations and thanks to you and SCDNR for on a great job! (George King)

The 2006 Aquatic Plant Management Plan for Lake Murray looks fine to me. Thanks for the work you do to prevent the spread of invasive species of aquatic weeds. I think the grass carp stocked in 2003 have done a wonderful job of controlling hydrilla and Illinois Pondweed. Keep up the good work! (Parker)

We are concerned about the influx of weeds that prevents enjoyment of the lake. The plan calls for 4300 acres to be the trigger point for control action to begin. This is too high of a level to begin control actions. (Gustafson)

THE PURPOSE OF THIS LETTER IS TO MAKE IT CLEAR THAT THE HYDRILLA IS NOT GONE ... IT HAS JUST MIGRATED TO A TWO MILE LONG COVE WHICH IS SANDWICHED BETWEEN HIGHWAY 378 AND HORSE CREEK RD. The water adjoining our property had no nuisance vegetation until after the long drawdown for construction of the back-up dam. When the water returned in 2005, most of the cove quickly filled with hydrilla and a little water primrose. Because hydrilla is a perennial plant and because there are certainly tubers under the water and in the mud, we expect the hydrilla problem to explode when the weather warms. The property owners in this area of the lake need a three prong attack. Probably most importantly, we need to be scheduled for sterile grass carp stocking before the weed Gets a full grip on the cove this Spring. It would seem that early use of the appropriate herbicide might also help curtail the invasion. Finally, we may need commercial mechanical removal this Summer. (Hoppe, Shealy, Robert King, Becker, Bell, Peake, Gobbel, Blakewood, Autrey, Blackford, Noll, McElyea, Rains, Elles, Woods, Cubb, Rucker, Long, Fagg, Schmitt, Barnhill)

I think the drawdown alone was enough to control hydrilla for a couple years. Why didn't we learn a lesson from the effects of eradication of hydrilla from Santee? Total elimination has a negative affect on fishing and ducks. Why not find a balance? Hydrilla as we speak is no longer in Lake Murray. Why have a control plan? You have succeeded in killing it all and it can't come back with all the carp. (Herlong)

**Response:**

Even though no hydrilla was found in a late fall survey it shouldn't be taken for granted that it is gone. The carp and the drawdown both helped to control the hydrilla and pondweed problems that were being experienced on the lake. However, hydrilla tubers and pondweed seeds are still viable

and abundant in Lake Murray. The goal is to provide long-term control of these invasive species, which will take several years to fully assess.

The trigger mechanism of 4300 acres of hydrilla only applies to use of grass carp. Other control activities may be initiated at lower infestation levels. This year's plan is consistent with the 2005 plan. The 2006 plan calls for no stocking of grass carp on Lake Murray unless hydrilla coverage exceeds 4,300 acres above the 330-foot contour at which time the Aquatic Plant Management Council may reconsider the need for additional grass carp. A late fall survey showed no appreciable hydrilla, so a dramatic increase in that acreage would have to occur to consider stocking more carp. However, this year's plan does include the option of select herbicide control around municipal water intakes and high traffic landings if needed.

A survey of this area by SCDNR staff and discussions with SCE&G staff familiar with the area in question indicate that a plant other than hydrilla caused the problem. Water primrose and different terrestrial vegetation are routinely being confused with hydrilla. The drawdown exposed a lot of unvegetated shoreline where water primrose quickly spread and re-established at the 345-348 foot contour level. Water primrose is normally a shoreline species. It extends out into the water but is rooted close to the shoreline. While this plant can be invasive and cause localized problems, it has been in the lake for decades and is typically not a threat to general public access and use of the waterway. Based on past experience, it is expected that most of the plants that are rooted in deep water will not survive after the lake level returns to full pool. Another problem associated with primrose control is that all available herbicides require some set back or water use restriction for irrigation or potable water. Therefore, there are no plans to control its growth this year. However, the SCDNR and SCE&G will monitor aquatic plant growth in this area and reconsider control options as needed.

Drawdowns have a limited effect on hydrilla. Normally for 2–3 years after a drawdown, the zone where the drawdown occurred has little hydrilla growth. However, large amounts of hydrilla still existed in the areas below the drawdown level and still presented major problems. Although hydrilla was under control last year, a plan is needed to address the potential for regrowth of hydrilla and Illinois pondweed this year.

**Plan Modifications:** None at present.

### **Summary of Public Comments, Responses, and Plan Modifications to the Draft 2005 South Carolina Aquatic Plant Management Plan**

**Commenters:** Lee Bacot, Teresa Cannon, Jeremiah Jensen, Alan Rae, David Rogers, Randy Saliga, Michael Sizer, Joseph M. Walker, Mark West, Jesse N. Williams III, Jon & Judy Willkomm, Sharpep2

**Lake Murray:**

**Comments:**

I support the management plan at the level APMC has recommended for 2005 (Saliga)

I'd voice my opinion against the use of more grass carp... I have no problem with the spot treatment of access points and intakes, but I'm worried that the use of more carp could result in a situation similar to Santee where the grass was totally exterminated. (Jensen)

Why can't we just come to an agreement on the hydrilla (Lake Murray) like they did on Lake Gunterville, AL? (Rae)

Replacing vegetation removed by carp with artificial habitat would be a great compromise for fishermen. (Rogers)

The reason the fishing is good is because of the grass! Take a note from VA and Maryland they treat it as a natural resource up there, they even have signs at the landings asking people to protect it! (Walker)

Introducing the grass carp to Lake Murray is killing the grass off too fast, before long there is going to be no grass left, Murray is a recreational lake and fishing is going to suffer. (West)

The idea of releasing large numbers of grass carp is frightening. (Williams)

I'm afraid to purchase a pontoon because of the weeds. (Cannon)

Primrose is blocking access and navigation for many residents. (Sizer)

We are very concerned about water primrose and hope that serious steps are being taken. (Willkomm)

I am anxious about the continual uncontrolled spread of primrose in the upper part of the lake. I urge the DNR to recognize the rapidly expanding growth of water primrose as a major threat to Lake Murray and to include the control of this plant in the 2005 plan. (Bacot)

It comes as no surprise to any of us that there is no plan to address the primrose problem and that DNR fails to even mention it. We are not in the more affluent section of the lake. (Sharpe2)

**Response:**

Aquatic vegetation in general is beneficial to the lake ecology and the plan clearly acknowledges this point by specifying as one of the management objectives (c.) to maintain diverse aquatic plant community. Along those lines, the DNR hopes to reinvigorate the Lake Murray Habitat Enhancement Program that it initiated several years ago to plant desirable native vegetation to enhance fish and wildlife habitat and help control shoreline erosion. Also, one of the main reasons for stocking while the lake was down is to be able to achieve control using fewer grass carp, thus minimizing the possibility of controlling too much of the vegetation.

This year's plan is consistent with the 2004 plan. The 2005 plan calls for no stocking of grass carp on Lake Murray unless hydrilla coverage exceeds 4,300 acres above the 330-foot contour at which time

the Aquatic Plant Management Council may reconsider the need for additional grass carp. A late fall survey showed only 2,400 acres of hydrilla, a dramatic increase in that acreage would have to occur to consider stocking more carp. However, this year's plan does include the option of select herbicide control around municipal water intakes and high traffic landings if needed.

Water primrose is normally a shoreline species. It extends out into the water but is rooted close to the shoreline. During the two-year drawdown water primrose established its self at various locations throughout the upper part of Lake Murray. However, as water levels rise and the lake returns to its normal elevation, the water primrose problem is expected to subside. SCE&G and DNR will monitor the growth and extent of the primrose throughout 2005 and reconsider control options as needed.

**Plan Modifications:**

A long-term management goal is added in Section 12-f.

Section 12-f states: Water primrose - Water primrose, a shoreline plant, became problematic in the upper portion of the lake last year. The two-year drawdown exposed a lot of unvegetated shoreline where water primrose quickly spread and re-established at the 345-348 foot contour level. While this plant can be invasive and cause localized problems, it has been in the lake for decades and is typically not a threat to general public access and use of the waterway. Based on past experience, it is expected that most of the plants that are rooted in deep water will not survive after the lake level returns to full pool. Therefore, there are no plans to control its growth this year. However, the SCDNR and SCE&G will monitor water primrose growth and consider control options if impacts are greater than anticipated.

**Santee Cooper Lakes:**

**Comments:**

What's this stuff I read on 2004 Santee Cooper about allowing fish to have 10% surface vegetation area for fish? What sense does that make? (Rae)

I implore you to not stock more grass carp in our impoundments. There are so many other methods, some are which expensive and you have listed in the management plan. Our natural resources, which include our fish and wildlife, need to be cared for with all parties in mind, not just hunters and fishermen, and not just wealthy property owners that ski and pleasure boat. (Williams)

One suggestion I have is that before we release more grass carp into any impoundments, let's consult B.A.S.S. or other organizations that have the funding and database to do the research. (Williams)

**Response:**

The language in the draft plan is consistent with the comments not to stock more grass carp in the Santee Cooper Lakes. No additional grass carp are planned for 2005, but the Council may reconsider the need for additional fish if hydrilla regrowth and regrowth potential warrants it.

The long-term management strategy for hydrilla control in the Santee Cooper Lakes is to maintain a sufficient number of grass carp in the system to keep hydrilla suppressed while allowing desirable native vegetation to flourish. The DNR and Santee Cooper recognize that although the grass carp have been effective in controlling hydrilla they have also controlled many desirable submersed aquatic plant species. In response to this concern, the agencies have signed an agreement that identifies management goals and objectives that try to maintain 10% of the lakes' surface area as beneficial vegetated habitat for fish, waterfowl and other aquatic organisms. The Aquatic Plant Management Council has adopted the management agreement as part of the long-term management strategy for the Santee Cooper Lakes and has included it in the final 2005 Aquatic Plant Management Plan. An important part of the agreement between the agencies is accurate and timely monitoring of aquatic vegetation. The agencies will work together in developing a monitoring work plan. Decisions regarding subsequent stocking of grass carp will be determined by the Council following assessment of monitoring results by DNR, Santee Cooper, and other agency representatives on the Council.

Submersed and emergent vegetation provides important habitat for waterfowl and fish as well as other types of wildlife. Management plans in public waters always attempt to control invasive species while trying to maintain desirable vegetation. Grass carp are used only after other more selective control methods have proven ineffective and after ample discussion in public meetings and plan reviews. Except for two sub-impoundments of Lake Marion, no grass carp are planned for any state waterways in 2005

**Plan Modifications:** None at present.

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