FY2021-2022
ANNUAL SOUTH CAROLINA
AQUATIC PLANT MANAGEMENT PLAN

Prepared by the
Aquatic Nuisance Species Program
South Carolina Department of Natural Resources
and Approved by the
South Carolina Aquatic Plant Management Council
2021

2021 SOUTH CAROLINA
AQUATIC PLANT MANAGEMENT COUNCIL

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PART II – FY2021-22 ANNUAL MANAGEMENT PLAN

INTRODUCTION

The Annual Management Plan for 2021 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 l) 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			
Common Name	***Scientific Name***	**Common Name**	***Scientific Name***
Alligatorweed	*Alternanthera philoxeroides*	**Hydrilla**	*Hydrilla verticillata*
Bladderwort	*Utricularia spp.*	**East Indian hygrophila**	*Hygrophila polysperma*
Brazilian elodea	*Egeria densa*	**Illinois Pondweed**	*Potamogeton illinoensis*
Bur Marigold	*Bidens spp.*	**Lotus**	*Nelumbo lutea*
Cattails	*Typha spp.*	**Musk-grass**	*Chara spp.*
Chinese Tallow	*Sapium sebiferum*	**Parrotfeather**	*Myriophyllum aquaticum*
Coontail	*Ceratophyllum demersum*	**Pondweed**	*Potamogeton spp.*
Common reed (Phragmites)	*Phragmites australis*	**Slender naiad**	*Najas minor*
Common salvinia	*Salvinia minima*	**Smartweed**	*Polygonum densiflorum*
Creeping rush	*Juncus repens*	**Southern naiad**	*Najas guadalupensis*
Crested Floating-heart	*Nymphoides cristata*	**Spatterdock**	*Nuphar luteum macrophyllum*
Curly-leaf pondweed	*Potamogeton crispus*	**Spikerush**	*Eleocharis spp.*
Cyanobacteria	*Anabaena, Aphanizomenon, and Microcystis spp., etc.*	**Stonewort**	*Nitella*
Duckweed	*Lemna spp.*	**Swamp loosestrife**	*Decodon verticillatus*
Eel Grass	*Vallisneria americana*	**Variable-leaf pondweed**	*Potamogeton diversifolius*
Eurasian watermilfoil	*Myriophyllum spicatum*	**Water hyacinth**	*Eichhornia crassipes*
Fanwort	*Cabomba caroliniana*	**Water lettuce**	*Pistia stratiotes*
Filamentous algae	*Pithophora, Lyngbya, Hydrodictyon spp.*	**Waterlily**	*Nymphaea odorata*
Floating bladderwort	*Utricularia inflata*	**Watermilfoil**	*Myriophyllum spp.*
Floating heart	*Nymphoides spp.*	**Water pennywort**	*Hydrocotyle ranunculoides*
Frog's bit	*Limnobium spongia*	**Water primrose**	*Ludwigia hexapetala*
Giant cutgrass	*Zizaniopsis miliacea*	**Watershield**	*Brasenia schreberi*
Giant salvinia	*Salvinia molesta*		

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 (SCDNR) 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 2020. Some water bodies are not active every year but remain in the plan because of previous major problems. Problematic species may change throughout the current year and

inclusion in the plan is no guarantee the listed work will be done this year. All control work is based on existing funding and priority levels of both the invasive species and the water bodies in the plan. SPECIAL NOTE: Due to budget constraints and to continue to serve all the areas around the state, each water body will only be eligible for up to $30,000 of cost share money from the SCDNR.

Water body	Location	Surface acres	Aquatic plants	Coverage acres	Impaired activities
Ashepoo River	Colleton County	Unknown	Water hyacinth	200	Boating, hunting, fishing, public access
Back River Reservoir	Berkeley County	850	Hydrilla, Water hyacinth, Water primrose, Fanwort, Cutgrass	360	Boating, fishing, hunting, swimming, industrial water supply, municipal water supply, electric power generation, public access
Baruch Institute	Georgetown County	Unknown, adjacent to Winyah Bay	Phragmites	50	Boating, hunting, fishing, public access
Black Mingo Creek	Georgetown County	Unknown	Alligatorweed, Parrotfeather, Water hyacinth, Frog's bit, Pennywort	5	Boating, hunting, fishing, public access
Black River	Georgetown County	Unknown	Alligatorweed, Water primrose, Water hyacinth, Parrotfeather, Frog's bit, Pennywort, Phragmites	40	Boating, hunting, fishing, public access
Bonneau Ferry	Berkeley County	Multiple Reserves and impoundments	Water hyacinth, Water primrose, Frog's bit, Lotus, Cattails, Cutgrass, Pennywort, Parrotfeather, Fanwort, Coontail, Duckweed	40	Boating, hunting, fishing, public access
Charleston County Parks	Charleston County (CawCaw and Laurel Hill)	Unknown	Hydrilla, Water primrose, Water hyacinth, Phragmites, Chinese tallow, Milfoil, Waterlily	5	Recreational and public access
Combahee River (Borrow pit)	Colleton County	approx. 5	Hydrilla, Water primrose, Water hyacinth, Alligatorweed, Parrotfeather, Frog's bit	4	Boating, hunting, fishing, public access
Cooper River (and adjacent rice fields)	Berkeley County	Unknown	Hydrilla, Water primrose, Water hyacinth, Brazilian elodea, Fanwort	approx. 2,800	Boating, hunting, fishing, public access

Water body	Location	Surface acres	Aquatic plants	Coverage acres	Impaired activities
Donnelley Bear Island WMA	Colleton County	Multiple impoundments and rivers	Cutgrass, Frog's bit, Cattails, Phragmites, Swamp loosestrife	80	Hunting, public access
Dungannon Plantation Heritage Preserve	Charleston County	Unknown	Cutgrass, Frog's bit, Cattails, Water primrose, Swamp loosestrife, Bur Marigold	14	Wood stork nesting site, public access
Goose Creek Reservoir	Berkeley County	600	Water hyacinth, Water lettuce, Water primrose, Hydrilla, Common salvinia, Spatterdock, East Indian hygrophyla, Watermilfoil, Fanwort, Duckweed	180	Boating, public access, industrial water supply, floodway
Lake Bowen & Reservoir #1	Spartanburg County	1534 & 1483	Muskgrass (Chara), Bladderwort	175	Boating, fishing, hunting, swimming, industrial water supply, municipal water supply, public access
Lake Cunningham	Greenville County	160	Brazilian elodea, Water primrose, Fragrant Waterlily, Spatterdock	8	Boating, hunting, fishing, public access
Lake Greenwood	Laurens and Greenwood counties	11,400	Hydrilla, Slender naiad, Eel grass (Vallisneria), Water Primrose	<100	Potential impacts to electric power generation, boating, swimming, vector control, public access
Lake Keowee	Pickens and Oconee counties	18,300	Hydrilla, Slender naiad	10	Potential impacts to electric power generation, municipal water supply, boating, swimming, vector control, public access
Lake Monticello (Recreation Lake)	Fairfield County	6,700 (400)	Hydrilla	<1 (Recreation Lake)	Boating, swimming, fishing, vector control, public access
Lake Murray	Lexington and Richland counties	50,000	Hydrilla, Illinois pondweed, Water primrose, Southern naiad, Alligatorweed	50	Boating, swimming, domestic and municipal water intakes, public access
Lake Wateree	Kershaw County	13,710	Hydrilla, cutgrass, Filamentous algae	30	Potential impacts to boating, swimming, vector control, public access
Little Pee Dee River	Marion and Horry counties	Unknown	Alligatorweed, Water hyacinth	30	Boating, hunting, fishing, public access

Water body	Location	Surface acres	Aquatic plants	Coverage acres	Impaired activities
Lumber River	Marion and Horry counties	Unknown	Alligatorweed	5	Boating, hunting, fishing, public access
Pee Dee River	Georgetown County	Unknown	Water hyacinth, Phragmites	30	Boating, hunting
Prestwood Lake	Darlington County	300	Milfoil, Watershield, Filamentous algae, Water hyacinth	75	Boating, fishing, recreation
Samworth WMA	Georgetown County	Unknown	Phragmites, Water hyacinth, Common salvinia, Zizaniopsis	60	Hunting, public access
Santee Coastal Reserve	Georgetown County	Unknown	Phragmites	1500	Hunting, public access
Santee Delta WMA	Georgetown County	Unknown	Phragmites	50	Hunting, public access
Waccamaw River	Georgetown and Horry counties	Unknown	Water hyacinth, Phragmites, Common salvinia	200	Boating, hunting, fishing, public access
Yawkey Wildlife Center	Georgetown County	Unknown	Phragmites, Cattails, Cutgrass	25	Hunting, public access
Santee Cooper Lakes					
Lake Marion	Sumter, Clarendon, Calhoun, Berkeley, and Orangeburg counties.	110,000	Alligatorweed, Brazilian elodea, Hydrilla, Water primrose, Water hyacinth, Crested floating heart, Giant salvinia, Common salvinia, Filamentous algae*, Fanwort*, Giant cutgrass*, Water milfoil*, Waterwillow* *When necessary.	TBD	Boating, swimming, public access, potential electric power generation, potential domestic and irrigation water withdrawals
Lake Moultrie	Berkeley County	60,400	Alligatorweed, Brazilian elodea, Hydrilla, Water primrose, Water hyacinth, Crested floating heart, Giant salvinia, Common salvinia, Filamentous algae*, Fanwort*, Giant cutgrass*, Water milfoil*, Waterwillow* *When necessary.	TBD	Potential electric power generation, boating, swimming, public access, potential domestic and irrigation water withdrawals
Santee Cooper Area WMA'S					

Water body	Location	Surface acres	Aquatic plants	Coverage acres	Impaired activities
Hatchery WMA	Berkeley County	Unknown	Crested Floating Heart, Cattails, Hydrilla, Water Primrose	28	Boating, hunting, fishing, public access
Hickory Top WMA	Clarendon County	Unknown	Cutgrass, Cattails, Misc. Woody Species	30	Boating, hunting, fishing, public access
Potato Creek WMA	Clarendon County	Unknown	Hydrilla, Water Hyacinth, Water Primrose, Bladderwort, Cutgrass, Lotus	140	Boating, hunting, fishing, public access
Sandy Beach WMA	Berkeley County	Unknown	Crested Floating Heart, Cattails, Cutgrass, Lotus, Water Primrose, Misc. Woody Species, Hydrilla	40	Boating, hunting, fishing, public access
Santee Cooper WMA	Orangeburg County	Unknown	Crested Floating Heart, Cattails, Cutgrass, Lotus, Water Primrose, Waterlily, Misc. Woody Species	100 (multiple waterbodies)	Boating, hunting, fishing, public access
SC Parks, Recreation and Tourism, State Park Lakes					
Aiken State Park	Aiken County	16	Floating heart, Cattails, Lemon bacopa, Watershield	10	Fishing, swimming, aesthetics
Barnwell State Park	Barnwell County	12	Waterlily, Cattails, Pondweed, Maidencane	9	Fishing, swimming, aesthetics
Charles Towne Landing State Park	Charleston County	5	Duckweed, Alligatorweed, Pennywort, Cyanobacteria, Algae	4	Fishing, tourism, aesthetics
Cheraw State Park	Chesterfield County	280	Floating heart, Waterlily, Spatterdock, Watermilfoil	10	Fishing, swimming, aesthetics
Croft State Park	Spartanburg County	145	Hydrilla	50	Fishing, swimming, aesthetics
H. Cooper Black Recreation Area	Chesterfield County	2	Spatterdock, Waterlily, Watershield	2	Recreational activities
Hunting Island State Park	Beaufort County	1	Duckweed, Parrotfeather	1	Fishing, swimming, aesthetics
Huntington Beach State Park	Horry County	15	Cutgrass, Phragmites, Cattails	10	Recreational activities

Water body	Location	Surface acres	Aquatic plants	Coverage acres	Impaired activities
Kings Mountain State Park Crawford Lake	York County	9	Slender naiad, Misc. species	4	Swimming, boating
Lee State Park	Lee County	1.75	Watermilfoil	3	Fishing, swimming, aesthetics
Little Pee Dee State Park	Dillon County	75	Spikerush, Spatterdock, Waterlily, Watershield	15	Fishing, boating
N.R. Goodale State Park	Kershaw County	160	Waterlily, Watershield	60	Swimming, recreational activities
Paris Mountain State Park	Greenville County	9.5	Slender naiad, Watershield, Pondweed	6	Fishing, swimming, aesthetics
Poinsett State Park	Sumter County	9	Spatterdock, Cattails	5	Fishing, swimming, aesthetics
Sesquicentennial State Park	Richland County	25	Waterlily, Watershield, Fanwort	12	Swimming, fishing
SCDNR State Lakes					
Lake Cherokee	Cherokee County	50	Water primrose	5	Boating, fishing
Lake Edwin Johnson	Spartanburg County	40	Water primrose, Hydrilla, Pondweed	10	Boating, fishing
Jonesville Reservoir	Union County	25	Water primrose, Pondweed	10	Boating, fishing
Mountain Lakes	Chester County	70	Water primrose, Alligatorweed, Parrotfeather	5	Boating, fishing
Lancaster Reservoir	Lancaster County	61	Water primrose, Alligatorweed	8	Boating, fishing, hunting
Sunrise Lake	Lancaster County	25	Pondweed	15	Boating, fishing
Lake Ashwood	Lee County	75	Waterlily	spotty	Boating, fishing
Lake Edgar Brown	Barnwell County	100	Water primrose, Coontail, Water hyacinth	60	Boating, fishing
Lake George Warren	Hampton County	400	Cattails, Water primrose, Coontail	20	Boating, fishing
Lake Thicketty	Cherokee County	100	Hydrilla	5	Boating, fishing
Dargan's Pond	Darlington County	50	Pondweed	15	Boating, fishing

Water body	Location	Surface acres	Aquatic plants	Coverage acres	Impaired activities
Lake Paul Wallace	Marlboro County	300	Hydrilla, naiad	200	Boating, fishing
South Carolina Border Lakes					
Lake Wylie	York County, SC; Gaston and Mecklenburg County, NC	13,443	Hydrilla, Alligatorweed	<100 (all in NC waters)	Potential impacts include electric power generation, boating, swimming, public access, domestic and irrigation water withdrawals
Lake Thurmond	South Carolina, Georgia Border	71,100	Hydrilla	> 7000	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. Problematic species may change based on environmental conditions. Therefore, this plan is fluid and will utilize an adaptive management approach. 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 SCDNR in cooperation with the local sponsor. A summary of proposed expenditures for 2021 and a location map of problem water bodies are located at the end of this section. **SPECIAL NOTE:** Due to budget constraints (to serve all the areas around the state), each water body will only be eligible for up to $30,000 of cost share money from the SCDNR.

Public Waters

1. **Ashepoo River (Colleton County)**

   Problem plant species:

   Water hyacinth

   Management objectives:

   Reduce water hyacinth populations to enhance public access, navigation, and water flow.

   Selected control method:

   <u>Problem Species</u> <u>Control Agent</u>

Water hyacinth	Triclopyr, Diquat, Imazamox, Imazapyr, Glyphosate, ProcellaCOR-SC, Flumioxazin

Area to which control is to be applied:

Through river system upstream and downstream of US 17 bridge.

Rate of control agents to be applied:

Triclopyr - 0.500 - 0.750 gallons per acre.

Diquat - 0.500 gallons per acre.

Imazamox - 0.250 - 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre.

Imazapyr – 0.250 - 0.750 gallons per acre.

ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

Flumioxazin – 2 oz/ac as an efficacy booster for foliar application.

Method of application of control agents:

Triclopyr, Diquat, Imazapyr, Imazamox, ProcellaCOR-SC, Glyphosate, and Flumioxazin - spray on surface of foliage with appropriate surfactant.

Timing and sequence of control application:

Apply herbicide periodically to water hyacinth from May through October as needed.

Other control application specifications:

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

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. Label rate of herbicide will be stringently adhered to.

Entity to apply control agents:

Commercial applicator, SCDNR staff.

Estimated cost of control operations:

$25,000

Potential sources of funding:

Water hyacinth -

Colleton County 50%

SCDNR 50% (up to $30,000 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 using 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.

2. 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 62.50-acre area adjacent to Dominion Energy's 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 in a 2-acre area at Bushy Park Landing to enhance public boating and fishing use in this area.

Selected control method:

Problem Species	Control Agent
Water hyacinth	Triclopyr, Diquat, Imazamox, Penoxsulam, Imazapyr, Glyphosate, ProcellaCOR-SC, Flumioxazin
Water primrose, Cutgrass	Triclopyr, Diquat, Imazapyr, Imazamox, Glyphosate, Flumioxazin
Hydrilla	Copper*, Copper*/Diquat, ProcellaCOR-SC
Fanwort, Coontail	Copper*, Copper*/Diquat

*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:

Triclopyr, Diquat, Imazapyr, Imazamox, Glyphosate, ProcellaCOR-SC and Penoxsulam - 300 acres of water hyacinth, water primrose and cutgrass throughout the lake.

Copper*/Diquat, Penoxsulam, ProcellaCOR-SC - 154 acres of hydrilla; 2 treatments of 62.50-acre area near Dominion Energy intake, 2 acres of hydrilla adjacent to Bushy Park Landing, 25 acres of hydrilla in Foster Creek arm (2 treatments-12.50 acres each).

Rate of control agents to be applied:

Triclopyr - 0.500 - 0.750 gallons per acre.

Diquat - 0.500 gallons per acre.

Imazamox - 0.250 - 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre.

Copper* - up to 1 ppm (about 10- 16 gallons per acre).

Copper*/Diquat - 4 gallons/2 gallons per acre

Imazapyr – 0.250 - 0.750 gallons per acre.

Penoxsulam - 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.

ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

Flumioxazin – 2 oz/ac as an efficacy booster for foliar application.

Method of application of control agents:

Triclopyr, Diquat, Imazapyr, Imazamox, Glyphosate, ProcellaCOR-SC, Flumioxazin and Penoxsulam - spray on surface of foliage with appropriate surfactant.

Copper*, Copper*/Diquat, ProcellaCOR-SC - subsurface injection from airboat.

Timing and sequence of control application:

Three hundred (300) acres of water hyacinth, water primrose and cutgrass treated with Triclopyr, Imazamox, Imazapyr, Glyphosate, Penoxsulam, ProcellaCOR-SC, Flumioxazin (May-October), Diquat (October, November). The initial treatments are to be followed in 1-2 days with a cleanup treatment.

12.50 acres of hydrilla in Foster Creek to be treated 2 times (April-October) with Copper, Copper/Diquat, ProcellaCOR-SC.

Hydrilla and fanwort located adjacent to public boat ramp to be treated with Copper*.

Hydrilla and fanwort located near the Dominion Energy water intake to be treated periodically during the year with Copper*, Copper*/Diquat, ProcellaCOR-SC (up to three times in the same 62.50-acre area), treatment area may be expanded as control is realized in target area.

Other control application specifications:

Herbicide used only upon approval by the SCDHEC.

All herbicide treatments conducted within 1600 feet of the Charleston Commissioners of Public Works (CPW) water intake will use Triclopyr at a rate of 0.5 gallons per acre or less or Penoxsulam at a rate of 2 to 6 oz/acre. Diquat treatments will be conducted at least 1600 feet from the intake. Following any application of Diquat within 1600 feet of the CPW water intake, herbicide residue concentrations may be monitored according to a plan agreed to by the SCDNR, CPW, and the SCDHEC.

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. Label rate of herbicide will be stringently adhered to.

Entity to apply control agents:

Commercial applicator, SCDNR staff.

Estimated cost of control operations:

$45,000

Potential sources of funding:

Water primrose and water hyacinth -

CPW 30%

Dominion Energy. 20%

SCDNR 50% (up to $30,000 cost share per waterbody)

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

Hydrilla and fanwort (near Dominion Energy intake) -

Dominion Energy. 50%

SCDNR 50% (up to $30,000 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) -

CPW 30%

Dominion Energy. 20%

SCDNR 50% (up to $30,000 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 using 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.

3. 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	Imazapyr, Glyphosate, Imazamox

Area to which control is to be applied:

50 acres of phragmites throughout area

Rate of control agent to be applied:

Imazapyr - 0.250 - 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre.

Imazamox - up to 5 % solution for spot spray.

Method of application of control agent:

Helicopter - 50 acres of Imazapyr, Glyphosate, Imazamox with appropriate surfactant 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.). Note: Proceed as funds are available from Baruch Institute.

Other control application specifications:

Label rate of herbicide will be stringently adhered to.

Entity to apply control agent:

Commercial applicator

Estimated cost of control operations:

$5,000

Potential sources of funding:

Baruch Institute 50%

SCDNR 50% (up to $30,000 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 using 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.

4. Black Mingo Creek (Georgetown County)

Problem plant species:

Alligatorweed, Parrot feather, Frog's bit, Pennywort, Water hyacinth

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	Triclopyr, Imazapyr, Imazamox, Glyphosate, Flumioxazin
Frog's bit, Parrot feather	Diquat, Penoxsulam, ProcellaCOR-SC, Flumioxazin
Water Hyacinth	Diquat, Triclopyr, ProcellaCOR-SC, Flumioxazin

Area to which control is to be applied:

5 acres of problematic plants throughout river

Rate of control agent to be applied:

Diquat - 0.500 gallon per acre.

Triclopyr - 0.500 to 0.750 gallons per acre.

Imazapyr - 0.250 - 0.750 gallons per acre.

Imazamox - 1 to 4 pints per acre.

Glyphosate - up to 0.937 gallons per acre.

ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

Flumioxazin – 2 oz/ac as an efficacy booster for 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:

Label rate of herbicide will be stringently adhered to.

Entity to apply control agent:

Commercial applicator, SCDNR staff.

Estimated cost of control operations:

$1000

Potential sources of funding:

Georgetown County 50%

SCDNR 50% (up to $30,000 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 using 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.

5. Black River (Georgetown County)

Problem plant species:

Alligatorweed, Water Primrose, Parrot feather, Frog's bit, Pennywort, Phragmites, Water hyacinth

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	Triclopyr, Imazapyr, Imazamox, Glyphosate, Flumioxazin
Frog's bit, Parrot feather	Diquat, Penoxsulam, ProcellaCOR-SC, Flumioxazin
Phragmites	Imazapyr, Imazamox, Glyphosate
Water primrose	Triclopyr, Diquat, Imazapyr, Imazamox, Glyphosate, Flumioxazin
Water hyacinth	Triclopyr, Diquat, Imazapyr, ProcellaCOR-SC, Flumioxazin

Area to which control is to be applied:

40 acres of problematic plants throughout river

Rate of control agent to be applied:

Diquat - 0.500 gallon per acre.

Triclopyr - 0.500 to 0.750 gallons per acre.

Imazapyr - 0.250 - 0.750 gallons per acre.

Imazamox - 1 to 4 pints per acre.

Glyphosate - up to 0.937 gallons per acre.

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

ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

Flumioxazin – 2 oz/ac as an efficacy booster for 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:

Label rate of herbicide will be stringently adhered to.

Entity to apply control agent:

Commercial applicator, SCDNR staff.

Estimated cost of control operations:

$3,250

Potential sources of funding:

Nature Conservancy 50%

SCDNR 50% (up to $30,000 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 using 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.

6. Bonneau Ferry (Berkeley County)

Problem plant species:

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

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	Triclopyr, Imazapyr, Imazamox, Glyphosate, Flumioxazin
Cattails, Cutgrass, Parrotfeather	Imazapyr, Imazamox, Glyphosate, ProcellaCOR-SC, Flumioxazin
Water hyacinth, Frog's bit	Triclopyr, Diquat, Imazamox, ProcellaCOR-SC, Penoxsulam, Flumioxazin
Duckweed	Flumioxazin
Fanwort, Coontail	Copper*, Copper*/Diquat

*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:

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

Rate of control agent to be applied:

Diquat - 0.500 gallon per acre.

Triclopyr - 0.500 to 0.750 gallons per acre.

Imazapyr - 0.250 - 0.750 gallons per acre.

Imazamox - up to a 5% solution for spot spray.

Flumioxazin – 2 oz/ac as an efficacy booster for foliar application, 5 to 12 oz/ac as a foliar application, submersed application 1 lb/ac foot.

Glyphosate - up to 0.937 gallons per acre.

Penoxsulam - Floating species – 2 to 6 fl oz/acre as foliar application, submersed approximately 0.174 gallons/acre foot.

ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

Copper* - up to 1 ppm (about 10- 16 gallons per acre).

Copper*/Diquat - 4 gallons/2 gallons per acre

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

Method of application of control agent:

Helicopter - 20 acres of Imazapyr, Glyphosate, Imazamox 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:

Label rate of herbicide will be stringently adhered to.

Entity to apply control agent:

Commercial applicator

Estimated cost of control operations:

$5,750

Potential sources of funding:

SCDNR 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 using 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.

7. Charleston County Parks
(Caw Caw Interpretative Center, Laurel Hill Plantation)
(Charleston County)

Problem plant species:

Phragmites, milfoil, waterlily, hydrilla, water primrose, water hyacinth, Chinese tallow

Management objective:

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

Selected control method:

Problem Species	Control Agent
Watermilfoil	2,4-D, Triclopyr/2,4-D, Imazamox, ProcellaCOR-SC
Waterlily	2,4-D, Imazapyr, Glyphosate, Imazamox, ProcellaCOR-SC
Phragmites	Imazapyr, Glyphosate, Imazamox
Water primrose	Triclopyr, Diquat, Imazapyr, Imazamox, Glyphosate, Flumioxazin
Water hyacinth	Triclopyr, Diquat, Imazapyr, ProcellaCOR-SC, Flumioxazin
Hydrilla	Copper*, Copper*/Diquat, ProcellaCOR-SC
Chinese Tallow	Imazapyr, Imazamox, Glyphosate

*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:

5 acres

Rate of control agent to be applied:

Imazapyr - 2 to 3 pints per acre.
Triclopyr/2,4-D – 200 lbs per acre.
Imazamox - up to 5% solution for spot spray.
Glyphosate - up to 0.937 gallons per acre.

2,4-D - up to 5 gallons per acre.

Diquat - 0.500 gallon per acre.

Triclopyr - 0.500 to 0.750 gallons per acre.

ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

Flumioxazin – 2 oz/ac as an efficacy booster for foliar application.

Copper* - up to 1 ppm (about 10- 16 gallons per acre).

Copper*/Diquat - 4 gallons/2 gallons per acre

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

Method of application of control agent:

Spray on surface of foliage with appropriate surfactant and subsurface injection from airboat. Granular herbicides spread evenly using appropriate rate.

Timing and sequence of control application:

Apply when plants are actively growing.

Other control application specifications:

Monitor plant growth prior to treatment.

Other control application specifications :

Label rate of herbicide will be stringently adhered to.

Entity to apply control agent:

Commercial applicator, SCDNR staff.

Estimated cost of control operations:

$1,000

Potential sources of funding:

Charleston Co. Parks 50%

SCDNR 50% (up to $30,000 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 using 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.

8. Combahee River (Colleton County)

Problem plant species:

Alligatorweed, Parrot feather, Frog's bit, Hydrilla, Water primrose, Water hyacinth

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	Triclopyr, Imazapyr, Imazamox, Glyphosate, Flumioxazin
Frog's bit, Parrot feather	Diquat, Penoxsulam, ProcellaCOR-SC
Water primrose	Triclopyr, Diquat, Imazapyr, Imazamox, Glyphosate, Flumioxazin
Water hyacinth	Triclopyr, Diquat, Imazapyr, ProcellaCOR-SC, Flumioxazin
Hydrilla	Copper*, Copper*/Diquat, ProcellaCOR-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:

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

Rate of control agent to be applied

Diquat - 0.500 gallon per acre.

Triclopyr - 0.500 to 0.750 gallons per acre.

Imazapyr - 2 to 3 pints per acre.

Imazamox - 1 to 4 pints per acre.

Glyphosate - up to 6 pints per acre.

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

ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

Flumioxazin – 2 oz/ac as an efficacy booster for foliar application.

Copper* - up to 1 ppm (about 10- 16 gallons per acre).

Copper*/Diquat - 4 gallons/2 gallons per acre

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

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

Label rate of herbicide will be stringently adhered to.

Entity to apply control agent

Commercial applicator, SCDNR staff.

Estimated cost of control operations

$700

Potential sources of funding

Colleton County 50%

SCDNR 50% (up to $30,000 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 using 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.

9. Cooper River (Berkeley County)

Problem plant species

Hydrilla, Water hyacinth, Water primrose, Brazilian elodea, Fanwort

Management objectives

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

Reduce water primrose growth along boat channels to maintain navigation.

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

Selected control method

Problem Species	Control Agent
Water hyacinth	Triclopyr, Diquat, Imazamox, Glyphosate, Penoxsulam, ProcellaCOR-SC, Flumioxazin
Water primrose	Triclopyr, Diquat, Imazapyr, Imazamox, Glyphosate, Flumioxazin
Hydrilla	Copper*, ProcellaCOR-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

Triclopyr, Diquat, Imazapyr, Imazamox, Glyphosate, Penoxsulam, Flumioxazin - 500 acres of water hyacinth and water primrose throughout river system and in narrow boat channels in French Quarter Creek, Rice Hope Plantation rice field, and Berkeley Country Club rice field.

Copper, ProcellaCOR-SC - 48 acres (16 acres treated 3 times yearly, spring and fall) to open boat trails in Pimlico, Berkeley Yacht Club and Rice Hope Plantation rice fields and French Quarter Creek canal.

Rate of control agents to be applied

Imazapyr - 2 to 4 pints per acre.

Diquat - 2 quarts per acre.

Triclopyr - up to 4 quarts per acre

Imazamox - 1 to 4 pints per acre.

Glyphosate - up to 0.937 gallons per acre.

*Copper - up to 1 ppm (about 16 gallons per acre).

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

ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

Flumioxazin – 2 oz/ac as an efficacy booster for foliar application.

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

Method of application of control agent

Triclopyr, Diquat, Imazapyr, Penoxsulam, ProcellaCOR-SC, Flumioxazin - spray on surface of foliage with appropriate surfactant.

Copper*, ProcellaCOR-SC - subsurface injection from airboat.

Timing and sequence of control application

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

Other control application specifications

Label rate of herbicide will be stringently adhered to.

Entity to apply control agent

Commercial applicator, SCDNR staff.

Estimated cost of control operations

$42,000

Potential sources of funding

Berkeley County 50%

SCDNR 50% (up to $30,000 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 using 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 rice fields to which the public does not have boat access. Water hyacinth from these rice fields can reinfest public areas.

10. Donnelley WMA/Bear Island WMA/ACE Basin (Colleton County)

Problem plant species

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

Management objective

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

Selected control method

Problem Species	Control Agent
Frog's bit, Cuban bullrush	Triclopyr, Penoxsulam, ProcellaCOR-SC, Flumioxazin
Phragmites, Cattails	Imazapyr, Imazamox, Glyphosate
Cutgrass, Swamp loosestrife	Imazapyr, Imazamox, Glyphosate

Area to which control is to be applied

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

Rate of control agent to be applied

Triclopyr - 0.500 to 0.750 gallons per acre

Imazapyr - 2 to 3 pints per acre.

Imazamox - 1 to 4 pints per acre.

Glyphosate - up to 0.937 gallons per acre.

Penoxsulam - Floating species – 2 to 12 fl oz/acre.

ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

Flumioxazin – 2 oz/ac as an efficacy booster for 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. Label rate of herbicide will be stringently adhered to.

Entity to apply control agent

Commercial applicator

Estimated cost of control operations

$10,000

Potential sources of funding

Donnelley WMA/USF&W/Nature Conservancy 50%

SCDNR 50% (up to $30,000 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 using 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.

11. 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	Triclopyr, Imazapyr, Imazamox, Glyphosate, Penoxsulam, ProcellaCOR-SC, Flumioxazin
Cattails	Imazapyr, Imazamox, Glyphosate
Cutgrass, Swamp loosestrife	Imazapyr, Imazamox, Glyphosate

Area to which control is to be applied

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

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

Rate of control agent to be applied

Triclopyr - 0.500 to 0.750 gallons per acre.
Imazapyr - 2 to 3 pints per acre.
Imazamox - 1 to 4 pints per acre.
Glyphosate - up to 6 pints per acre.
Penoxsulam - Floating species – 2 to 12 fl oz/acre.
ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.
Flumioxazin – 2 oz/ac as an efficacy booster for 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 Jon-boat. Label rate of herbicide will be stringently adhered to.

Entity to apply control agent

Commercial applicator

Estimated cost of control operations

$2,000

Potential sources of funding

Dungannon WMA 50%

SCDNR 50% (up to $30,000 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 using 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.

12. Goose Creek Reservoir (Berkeley County)

Problem plant species

Hygrophila, Water hyacinth, Water primrose, Water lettuce, Hydrilla, Watermilfoil, Fanwort, Common salvinia, Duckweed, Spatterdock

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 common salvinia and 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, Hygrophila	Triclopyr, Triclopyr/2,4-D, Imazapyr, Imazamox, Glyphosate, Flumioxazin
Water hyacinth, Water lettuce	Triclopyr, Diquat, Penoxsulam, Flumioxazin, ProcellaCOR-SC
Watermilfoil, fanwort	Diquat, 2,4-D, Imazamox
Hydrilla, Hygrophila	Endothall, *Copper, triploid grass carp, ProcellaCOR-SC
Common salvinia, Duckweed	Fluridone, Diquat, Penoxsulam, Flumioxazin
Spatterdock	Triclopyr, Imazapyr, Imazamox, ProcellaCOR-SC, Flumioxazin
Filamentous Algae	*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

Triclopyr, Imazapyr, Imazamox, Glyphosate- 100 acres water primrose in upper reservoir and boat ramp.

Diquat - 50 acres of water hyacinth and water lettuce throughout reservoir.

Triclopyr, Diquat, Penoxsulam, ProcellaCOR-SC - 100 acres of water hyacinth and water lettuce throughout the reservoir.

Diquat, 2,4-D, Penoxsulam, ProcellaCOR-SC - 20 acres of submersed growth throughout the reservoir.

Triclopyr, Imazapyr, Imazamox, Glyphosate, Endothall – up to 30 acres of Hygrophila 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 reservoir to achieve as even a distribution as practicable.

Fluridone, Diquat, Penoxsulam, Flumioxazin – 50 acres of duckweed near populated areas of the reservoir.

Copper* – 50 acres of filamentous algae near populated areas of the reservoir.

Rate of control agents to be applied

Diquat - 0.500 gallon per acre.
Triclopyr - 0.500 to 0.750 gallons per acre.
Imazapyr - up to 4 pints per acre.
Imazamox - 1 to 4 pints per acre.
Glyphosate - up to 6 pints per acre.
2,4-D - up to 5 gallons per acre.
Flumioxazin – 2 oz/ac as an efficacy booster for foliar application, 5 to 12 oz/ac as a foliar application, submersed application 1 lb/ac foot.
Fluridone AS - 10 to 30 ppb.
Fluridone Q, Fluridone PR, Fluridone One - up to 40 ppb (approx 10 pounds/acre).
Penoxsulam - 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.
ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

**Triploid Grass Carp - 800 fish in the entire reservoir.

*Based on a 32%(800) mortality to maintain existing population.

Method of application of control agents

Triclopyr, Imazapyr, Glyphosate, Diquat, Flumioxazin, Penoxsulam, ProcellaCOR-SC - spray on surface of foliage with appropriate surfactant.

Diquat, 2,4-D, Penoxsulam, ProcellaCOR-SC - subsurface injection from airboat.

The Aquatic Plant Management Council is committed to maintenance stocking of triploid grass carp in Goose Creek Reservoir to provide long-term control of hydrilla. A maintenance stocking plan approved for other water bodies provided for stocking a small number of grass carp, 1 carp to 8 or 10 surface acres, to control hydrilla while encouraging the expansion of a diverse, native aquatic plant community.

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, SCDNR staff.

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

Estimated cost of control operations

$34,500

Potential sources of funding

CPW 50%

SCDNR 50% (up to $30,000 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 using 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

13. Lake Bowen, Reservoir #1 (Spartanburg County)

Problem plant species

Muskgrass (Chara), Bladderwort

Note: Reservoir 1, which is fed by Lake Bowen, is a direct potable water supply lake for Spartanburg Water. Control in either water body of algae/diatoms or bacteria that increases levels of Geosmin or MIBs, which affects potable water supplies, will be accomplished for Spartanburg Water by independent contractors. All contractors must be properly certified and licensed. SCDNR will be pre-notified of the details and timing of this control so as not to cause unexpected problems with any control carried out for regular aquatic plant management activities by either SCDNR or Spartanburg Water's contractors. For information concerning taste and odor issues for potable water please contact Spartanburg Water directly.

Management objective

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

Selected control method

Problem Species	Control Agent
Chara, Bladderwort	Triploid grass carp, Copper*, Fluridone, ProcellaCOR-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

175 acres in lake.

Rate of control agent to be applied

Triploid grass carp: initial stocking to control Bladderwort and then stock to maintain 1 fish per 6 surface acre density when population levels dictate.
Lake Bowen – 80 triploid grass carp for maintenance control
Reservoir #1 – 25 triploid grass carp for maintenance control

Copper* - up to 1 ppm

Fluridone – up to 30 ppb in treatment area

ProcellaCOR-SC - 1-5 PDUs per acre for submersed application, 1-2 PDUs per acre for foliar application.

Method of application of control agents

Copper*, Fluridone, ProcellaCOR-SC - 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 chara 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 2021 (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 Bowen and Reservoir #1 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. Label rate of herbicide will be stringently adhered to.

Entity to apply control agent

Commercial applicator

Estimated cost of control operations

$30,000

Potential sources of funding

Spartanburg CPW 50%

SCDNR 50% (up to $30,000 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 using 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 submersed nuisance species. Triploid grass carp have been stocked to control submersed nuisance species 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 submersed nuisance species 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.

14. 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

Problem Species	Control Agent
Brazilian elodea	Copper*, triploid grass carp
Water primrose	Triclopyr, Imazapyr, Imazamox, Flumioxazin
Fragrant waterlily, spatterdock	Triclopyr, Imazapyr, Imazamox, ProcellaCOR-SC, Flumioxazin

* 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

8 acres of problematic plants throughout Lake Cunningham.

Rate of control agent to be applied

Triclopyr - 0.500 to 0.750 gallons per acre.
Imazapyr - 2 to 3 pints per acre.
Imazamox - 1 to 4 pints per acre.
Copper* – up to 1 ppm.
ProcellaCOR-SC - 1-5 PDUs per acre for submersed application, 1-2 PDUs per acre for foliar application.
Flumioxazin – 2 oz/ac as an efficacy booster for foliar application.
Triploid grass carp – Stock to maintain 1 fish per 8 surface acre density when population levels dictate.

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 2021 (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. Label rate of herbicide will be stringently adhered to.

Entity to apply control agent

Commercial applicator

Estimated cost of control operations

$1,500

Potential sources of funding

Greer CPW 50%

SCDNR 50% (up to $30,000 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 using 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.

15. Lake Greenwood (Greenwood and Laurens County)

Problem plant species

Slender naiad, Hydrilla, Water primrose, Eel grass (Vallisneria)

Management objectives

Maintain reduced 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 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 – stock 300 sterile grass carp yearly to get to and maintain a 1 carp to 5 surface acre ratio.

Aquatic herbicides - selected areas of water primrose infestation to provide public access.

Problem Species	Control Agent
Slender naiad, Hydrilla	Endothall, Fluridone, Triploid Grass Carp, Copper*, ProcellaCOR-SC, Diquat
Vallisneria (Eel grass)	Endothall, Fluridone, Copper*, Diquat
Water primrose	Triclopyr, Glyphosate, Imazapyr, Imazamox

* 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

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

Use aquatic herbicides to provide control at high priority public access points, such as boat ramps and park sites

Rate of control agents to be applied

Endothall - 0.500 to 4 ppm (about 3 to 8 gallons per acre depending on depth)

Imazapyr – 0.250 – 0.750 gallons per acre

Imazamox _up to 5% spot spray

Fluridone - 0.075 to 0.250 ppm

Copper* _ up to 1 ppm

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

ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

Triploid Grass Carp – Stock to maintain 1 to 5 surface acres density when population dictates and to add different age class fish. 300 sterile grass carp to maintain a density of 1 grass carp per 5 surface acres (2280 fish). The Aquatic Plant Management Council is committed to maintenance stocking of triploid grass carp in Lake Greenwood to provide long-term control of hydrilla. The Aquatic Plant Management Council, with recommendations from DNR and Lake Greenwood staff, agrees that the adaptive stocking plan should be continued, based on current observations of collected data, Herbicide treatments may be utilized to provide temporary control of hydrilla when necessary. Changes to the strategy will be implemented if survey results, regrowth, or habitat loss warrant.

Method of application of control agents

Endothall, Fluridone, Copper* - Subsurface application by airboat.

Triclopyr, Glyphosate, Imazapyr, Imazamox - 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

Agent to be applied 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 2021 (March-May).

Other control application specifications

Herbicide used only upon approval by the SCDHEC.

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. Label rate of herbicide will be stringently adhered to.

Hydrilla may require multiple treatments.

Entity to apply control system

Commercial applicator

Estimated cost of control operations

$10,000

Potential sources of funding

Greenwood County 50%

SCDNR 50% (up to $30,000 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 using 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.

16. Lake Keowee
(Pickens and Oconee County)

Problem plant species

Hydrilla, Slender naiad

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

Triploid grass carp – stock 125 sterile grass carp for maintenance of Hydrilla

Aquatic herbicides - selected areas of water primrose infestation to provide public access.

Problem Species	Control Agent
Slender naiad, Hydrilla	Endothall, Fluridone, ProcellaCOR-SC, Triploid Grass Carp, 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

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

Herbicide - 10 acres

Drawdown - entire lake

Rate of control agent to be applied

125 sterile grass carp for maintenance of hydrilla

Endothall - 0.500 to 4 ppm (about 3 to 8 gallons per acre depending on depth)

Fluridone - 0.075 to 0.250 ppm

Copper* - up to 1 ppm

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

ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

Triploid Grass Carp – Future stocking to attain and maintain 1 to 8 surface acres density when population dictates.

Drawdown - to the greatest extent possible within project limits.

Method of application of control agent

Endothall, Fluridone, Copper*, ProcellaCOR-SC - 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.

Drawdown - draw lake down.

Timing and sequence of control application

Agent to be applied when plants are actively growing.

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

250 Triploid grass carp to be released as soon as possible in the spring of 2021 (March-May).

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 SCDHEC. Treatment of control area will be conducted in a manner that will not significantly degrade water quality. Label rate of herbicide will be stringently adhered to.

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 Energy

Drawdown - Duke Energy

Estimated cost of control operations

Herbicide application - $0

Triploid Grass Carp - $1,200

Drawdown - Undetermined

Potential sources of funding

Duke Energy 50%

SCDNR 50% (up to $30,000 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 using 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.

17. Lake Monticello (Recreation Lake) (Fairfield County)

Problem plant species

Hydrilla

Management objectives

Manage hydrilla growth throughout the Recreation Lake section to minimize its spread to Lake Monticello, help prevent its spread to adjacent public waters, and minimize adverse impacts to agricultural irrigation withdrawals, and public use and access.

Selected control method

Problem Species	Control Agent
Hydrilla	Endothall, Fluridone, ProcellaCOR-SC, Triploid Grass Carp, 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

Hydrilla - Perform maintenance stocking in future years as needed (1 per 6 acres- 30 carp) to provide long term control option.

Rate of control agents to be applied

Endothall - 0.500 to 4 ppm (about 3 to 8 gallons per acre depending on depth)

Fluridone - 0.075 to 0.250 ppm

Copper* - up to 1 ppm

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

ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

Triploid Grass Carp – Perform maintenance stocking in future years (1 per 6 acres- 30 carp) to provide long term control option.

Method of application of control agents

Endothall, Fluridone, Copper*, ProcellaCOR-SC - 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

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

Maintenance stocking of Triploid grass carp to be released in subsequent years as population dictates. RESULTS FROM GRASS CARP MAY NOT BE EVIDENT FOR TWO OR MORE YEARS.

Other control application specifications

Herbicide used only upon approval by the SCDHEC.

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 SCDNR district fisheries biologist. In general, treatment will be limited to developed shoreline areas, public access sites, and areas of high public use. Label rate of herbicide will be stringently adhered to.

Hydrilla may require multiple treatments.

Entity to apply control system

Commercial applicator

Estimated cost of control operations

$250

Potential sources of funding

Triploid grass carp:

Dominion Energy, Lexington and Richland Counties 50%, SCDNR 50% (up to $30,000 cost share per waterbody)

Mechanical harvester:

Dominion Energy, Commercial marina operators, and residential property owners.

Aquatic herbicides:

Dominion Energy, Lexington and Richland Counties 50%, SCDNR 50% (up to $30,000 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 using 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.

18. Lake Murray
(Lexington, Newberry, Richland and Saluda Counties)

Problem plant species

Hydrilla, Water Primrose, Illinois Pond Weed, Southern Naiad, Alligatorweed

Management objectives

Minimize hydrilla growth throughout the lake to prevent its spread within the lake, help prevent its spread to adjacent public waters, and avoid 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 – stock 2000 triploid grass carp to enhance and maintain the population.

Aquatic herbicides - selected areas of water primrose infestation to provide public access.

Problem Species	Control Agents
Hydrilla, Illinois Pondweed	Copper*, Endothall, Fluridone, Imazamox, ProcellaCOR-SC
Water primrose	Triclopyr, Imazapyr, Imazamox, Glyphosate
Southern Naiad	Diquat, Endothall, Fluridone, Flumioxazin
Alligatorweed	Triclopyr, Imazapyr, Imazamox, Glyphosate, Flumioxazin

* 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

Release approximately one-half of the triploid grass carp on the north side of the lake and one-half on the south side.

Use aquatic herbicides to provide control at high priority public access points, such as boat ramps and park sites.

Rate of control agent to be applied

Triploid Grass Carp: Stock 2000 sterile grass carp to maintain the population. (Continue maintenance stocking in future years with 2000 sterile grass carp per year to maintain a density of 1 grass carp per 6 surface acres (approx. - 8333 fish). Continue maintenance stocking in 2021 based on conditions. Stock to maintain 1 to 6 surface acres density when population dictates and to add different age class fish. The Aquatic Plant Management Council is committed to maintenance stocking of triploid grass carp in Lake Murray to provide long-term control of hydrilla. The Aquatic Plant Management Council, with recommendations from SCDNR and Lake Murray staff, agrees that the adaptive stocking plan should be continued, based on current observations of collected data. Herbicide treatments may be utilized to provide temporary control of hydrilla when necessary. Changes to the strategy will be implemented if survey results, regrowth, or habitat loss warrant.

Water primrose treatment:
Triclopyr - 0.500 to 0.750 gallons per acre.
Imazapyr - 2 to 4 pints per acre.
Imazamox - 1 to 4 pints per acre.

Method of application of control agent

Triploid grass carp - See section 3 above.

All agents to be applied when plants are actively growing.

Timing and sequence of control application

Additional grass carp should be stocked in the spring/fall following Council approval.

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.

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 using 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 Dominion Energy. Harvesting precautions as stated in item above must be adhered to.

2) Aquatic herbicides – Dominion Energy 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 have been 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.

Aquatic herbicides - Commercial applicator under supervision by the SCDNR.

Estimated cost of control operations

Triploid grass carp - $16,000

Aquatic herbicides - $0

Potential sources of funding

Triploid grass carp:

Dominion Energy, Lexington and Richland Counties 50%

SCDNR 50% (up to $30,000 cost share per waterbody)

Mechanical harvester:

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

Aquatic herbicides:

Dominion Energy, Lexington and Richland Counties 50%

SCDNR 50% (up to $30,000 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 using 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.

19. Lake Wateree
(Fairfield, Kershaw and Lancaster Counties)

Problem plant species

Hydrilla, Filamentous algae

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.

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

Selected control method

Fall/winter water level drawdown

Aquatic herbicides - selected areas of invasive plant infestation to provide public access.

Problem Species	Control Agent
Hydrilla	Endothall, Fluridone, Triploid Grass Carp, ProcellaCOR-SC, Copper*
Filamentous algae	Copper*, peroxide based products

* 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

Use aquatic herbicides to provide control at high priority public access points, such as boat ramps and park sites

Drawdown - Entire Lake

Rate of control agent to be applied

Endothall – up to 4 ppm (about 8 gallons per acre depending on depth)

Fluridone - 0.075 to 0.250 ppm

Copper* - up to 1 ppm

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

ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

Drawdown - To the greatest extent possible within project limits.

Method of application of control agent

Endothall, Fluridone, ProcellaCOR-SC, Copper*, peroxide based products - Subsurface application by airboat.

Copper* - 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.

Drawdown - Draw lake down

Timing and sequence of control application

Agent to be applied when plants are actively growing.

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

Drawdown - Drawdown lake from October through February.

Other control application specifications

Herbicide used only upon notification of all local potable water supply authorities and approval by SCDHEC. Treatment of control area will be conducted in a manner that will not significantly degrade water quality. Label rate of herbicide will be stringently adhered to.

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 Energy

Drawdown - Duke Energy

Estimated cost of control operations

Herbicide application - $0.00 (Hydrilla has not been observed in several years on Lake Wateree, therefore no applications are needed at this time.)

Drawdown - Undetermined

Potential sources of funding

Duke Energy 50%

SCDNR 50% (up to $30,000 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 using 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.

20. 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	Triclopyr, Diquat, Imazamox, Glyphosate, Penoxsulam, ProcellaCOR-SC, Flumioxazin
Alligatorweed	Triclopyr, Diquat, Imazapyr, Imazamox, Glyphosate, Flumioxazin
Biological Control	Alligatorweed flea beetles (*Agasicles hygrophila)*

Area to which control is to be applied

30 acres of alligatorweed and water hyacinth throughout river

Rate of control agent to be applied

Imazapyr - 0.250 to 0.750 gallons per acre.
Diquat - 0.500 gallons per acre.
Triclopyr - 0.250 to 0.750 gallons per acre.
Imazamox - 0.125 to 0.750 gallons per acre.
Glyphosate - up to 0.937 gallons per acre.
Penoxsulam - 2 to 6 fluid ounces per acre as foliar application.
ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.
Flumioxazin – 2 oz/ac as an efficacy booster for 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

Label rate of herbicide will be stringently adhered to.

Entity to apply control agent

Commercial applicator

Estimated cost of control operations

$1,500

Potential sources of funding

Horry and Marion Counties 50%

SCDNR 50% (up to $30,000 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 using 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.

21. 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 - Triclopyr, Imazapyr, Imazamox, Glyphosate, Penoxsulam, ProcellaCOR-SC, Flumioxazin

Biological Control - Alligatorweed flea beetles (*Agasicles hygrophila)*

Area to which control is to be applied

5 acres of problematic plants throughout river

Rate of control agent to be applied

Triclopyr - 0.500 to 0.750 gallons per acre.

Imazapyr - 0.250 to 0.750 gallons per acre.

Imazamox - 0.250 to 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre.

Penoxsulam - 2 to 6 fluid ounces per acre as foliar application.

ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

Flumioxazin – 2 oz/ac as an efficacy booster for 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

Label rate of herbicide will be stringently adhered to.

Entity to apply control agent

Commercial applicator, SCDNR staff

Estimated cost of control operations

$500

Potential sources of funding

Horry and Marion counties 50%

SCDNR 50% (up to $30,000 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 using 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.

22. 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	Diquat, Triclopyr, Imazamox, Imazapyr, Penoxsulam, ProcellaCOR-SC, Flumioxazin
Phragmites	Imazapyr, Glyphosate, Imazamox

Area to which control is to be applied

25 acres of water hyacinth throughout river and adjacent public rice fields.

5 acres of phragmites in the Sandy Island area.

Rate of control agent to be applied

Diquat - 0.500 gallons per acre.
Glyphosate – up to 0.937 gallons per acre
Triclopyr - 0.500 to 0.750 gallons per acre.
Imazapyr - 0.250 to 0.750 gallons per acre.
Imazamox - 0.250 to 0.750 gallons per acre.
Penoxsulam - 2 to 6 fluid ounces per acre as foliar application.
ProcellaCOR-SC - 1-5 PDUs per acre foot as submersed application, 1-2 PDUs per acre foliar application.
Flumioxazin – 2 oz/ac as an efficacy booster for foliar application.

Method of application of control agent

Helicopter, airboat - 35 acres of herbicide applied to water hyacinth (Sandy Island Area 10 acres). 5 acres of Imazapyr applied to phragmites (Sandy Island Area 5 acres).

Timing and sequence of control application

Diquat, Triclopyr, Imazamox, Imazapyr, Glyphosate, Penoxsulam, ProcellaCOR-SC, Flumioxazin - to be applied periodically to water hyacinth from May through October.

Imazapyr, Imazamox, Glyphosate - Apply when plants are actively growing.

Other control application specifications

Label rate of herbicide will be stringently adhered to.

Entity to apply control agent

Commercial applicator, SCDNR staff

Estimated cost of control operations

$3,500

Potential sources of funding

Georgetown County 50%

SCDNR 50% (up to $30,000 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 using 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.

23. Prestwood Lake (Darlington County)

Problem plant species

Milfoil, Watershield, Filamentous algae, Water hyacinth

Management objective

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

Selected control method

Aquatic herbicides - selected areas of invasive plant infestation to provide public access.

Problem Species	Control Agent
Filamentous algae	Copper*
Water milfoil	Imazamox, Flumioxazin, 2,4-D, Triclopyr OTF Triclopyr/2,4-D, Diquat, Triploid Grass Carp, ProcellaCOR-SC
Water hyacinth	Imazamox, Triclopyr, Triclopyr/2,4-D, Diquat, ProcellaCOR-SC, Flumioxazin
Watershield	2,4-D, Triclopyr OTF, Triclopyr/2,4-D, ProcellaCOR-SC, Flumioxazin

* 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

Use aquatic herbicides to provide control at high priority public access points, such as boat ramps and park sites

Rate of control agent to be applied

Copper* – up to 1 ppm.

Imazamox – up to 0.500 gallons per acre.

Flumioxazin – 2 oz/ac as an efficacy booster for foliar application, submersed application 1 lb/ac foot.

2,4-D - up to 5 gallons per acre.

Triclopyr – up to 1 gallon per acre

Triclopyr/2,4-D - up to 200 pounds per acre.

Triclopyr OTF – 40 pounds per acre

Diquat - 2 gallons per acre.

ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

*Triploid Grass Carp – 100 fish

Method of application of control agent

Copper*, Imazamox, 2,4-D, Diquat, ProcellaCOR-SC - application by airboat with adjuvant.

Copper* - subsurface application with appropriate surfactant.

Triclopyr/2,4-D, Triclopyr OTF - Granular broadcast evenly from airboat.

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

Timing and sequence of control application

Agent to be applied when plants are actively growing.

Other control application specifications

Herbicide used only upon notification of all local potable water supply authorities and approval by SCDHEC as needed. Treatment of control area will be conducted in a manner that will not significantly degrade water quality. Label rate of herbicide will be stringently adhered to.

Entity to apply control agent

Commercial applicator or SCDNR staff

Estimated cost of control operations

$3,000

Herbicide application - $2,000

Triploid Grass Carp – $1,000

Potential sources of funding

City of Hartsville 50%

SCDNR 50% (up to $30,000 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 using 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.

24. Samworth WMA (Georgetown County)

Problem plant species

Water hyacinth, Phragmites, Zizaniopsis, Common salvinia

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	Diquat, Triclopyr, Imazamox, Imazapyr, Penoxsulam, ProcellaCOR-SC, Flumioxazin
Phragmites, Zizaniopsis	Imazapyr, Imazamox, Glyphosate
Common salvinia	Fluridone, Diquat, Penoxsulam, Flumioxazin

Area to which control is to be applied

50 acres of water hyacinth throughout river and adjacent public rice fields.

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

Rate of control agent to be applied

Diquat - 0.500 gallons per acre.
Triclopyr - 0.500 to 0.750 gallons per acre.
Glyphosate – up to 0.937 gallons per acre.
Imazapyr - 0.250 to 0.750 gallons per acre.
Imazamox - 0.250 to 0.750 gallons per acre.
Penoxsulam - 2 to 6 fluid ounces per acre as foliar application.
ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.
Fluridone AS - 10 to 30 ppb.
Fluridone Q, Fluridone PR, Fluridone One - up to 40 ppb (approx 10 pounds/acre).
Flumioxazin – 2 oz/ac as an efficacy booster for foliar application.

Method of application of control agent

Helicopter, airboat - 40 acres of herbicide applied to water hyacinth. 10 acres of Imazapyr, Glyphosate applied to phragmites, Zizaniopsis.

Timing and sequence of control application

Diquat, Triclopyr, Imazamox, Imazapyr, Glyphosate, Penoxsulam, ProcellaCOR-SC - to be applied periodically to water hyacinth from May through October.

Imazapyr, Imazamox, Glyphosate - Apply when plants are actively growing.

Other control application specifications

Label rate of herbicide will be stringently adhered to.

Entity to apply control agent

Commercial applicator or SCDNR staff

Estimated cost of control operations

$5,000

Potential sources of funding

Samworth WMA 50%

SCDNR 50% (up to $30,000 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 using 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.

25. 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

Imazapyr, Imazamox, Glyphosate

Area to which control is to be applied

1500 acres of phragmites throughout the rice fields.

Rate of control agent to be applied

Imazapyr - 0.500 to 0.750 gallons per acre.
Glyphosate – up to 0.937 gallons per acre.
Imazamox - 0.500 to 0.750 gallons 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. Label rate of herbicide will be stringently adhered to.

Entity to apply control agent

Commercial applicator, SCDNR staff

Estimated cost of control operations

$TBD

Potential sources of funding

Santee Coastal Reserve 50%

SCDNR 50% (up to $30,000 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 using 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.

26. 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

Imazapyr, Imazamox, Glyphosate

Area to which control is to be applied

50 acres of Phragmites throughout the rice fields.

Rate of control agent to be applied

Imazapyr - 0.500 to 0.750 gallons per acre.
Glyphosate – up to 0.937 gallons per acre
Imazamox - 0.500 to 0.750 gallons 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. Label rate of herbicide will be stringently adhered to.

Entity to apply control agent

Commercial applicator, SCDNR staff

Estimated cost of control operations

$1,500

Potential sources of funding

Santee Coastal Reserve 50%

SCDNR 50% (up to $30,000 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 using 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.

27. Waccamaw River (Horry County)

Problem plant species

Water hyacinth, Phragmites, Common salvinia

Management objective

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

Selected control method

Problem Species	Control Agents
Water hyacinth	Diquat, Triclopyr, Imazamox, Penoxsulam, ProcellaCOR-SC, Flumioxazin
Phragmites	Imazapyr, Imazamox, Glyphosate
Common salvinia, Duckweed	Fluridone, Diquat, Penoxsulam, Flumioxazin

Area to which control is to be applied

200 acres throughout river system where needed.

Rate of control agent to be applied

Diquat - 0.500 gallons per acre.
Triclopyr - 0.500 to 0.750 gallons per acre.
Glyphosate – up to 0.937 gallons per acre.
Imazapyr - 0.500 to 0.750 gallons per acre.
Imazamox - 0.500 to 0.750 gallons per acre.
Penoxsulam - 2 to 6 fluid ounces per acre as foliar application.
ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.
Fluridone AS - 10 to 30 ppb.
Fluridone Q, Fluridone PR, Fluridone One - up to 40 ppb (approx 10 pounds/acre).
Flumioxazin – 2 oz/ac as an efficacy booster for 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 SCDHEC. Treatment of control area will be conducted in a manner that will not significantly degrade water quality.

Entity to apply control agent

Commercial applicator, SCDNR staff.

Estimated cost of control operations

$ 20,000

Potential sources of funding

Horry County 50%

SCDNR 50% (up to $30,000 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 using 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.

28. 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

Imazapyr, Imazamox, 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

Imazapyr - 0.500 to 0.750 gallons pints per acre.
Imazamox - 0.500 to 0.750 gallons per acre.
Glyphosate - up to 0.937 gallons 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, SCDNR staff

Estimated cost of control operations

$3,850

Potential sources of funding

Yawkey Foundation 50%

SCDNR 50% (up to $30,000 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 using 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 Cooper Lakes

29. Lake Marion
(Calhoun, Clarendon, Orangeburg, Berkeley, and Sumter Counties)

30. Lake Moultrie
(Berkeley County)

NOTE: The following management plan applies to both lakes.

Problem plant species

Hydrilla, Brazilian elodea, Alligatorweed, Water hyacinth, Water primrose, Crested floating heart, Giant salvinia, Common salvinia, **Giant cutgrass, ** algae **Cattail, **Fanwort, **Watermilfoil, **Waterwillow

**Species are only treated when they impede access or navigation in priority use areas, or when they pose a threat to drinking water quality.

Management objectives

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

Control hydrilla growth throughout the main lakes and sub-impoundments to minimize its spread within the lakes, help prevent its spread to adjacent public waters, and minimize adverse impacts to native plant populations, electric power generation, agricultural irrigation withdrawals, public drinking water withdrawals, and public use and access.

Control water hyacinth populations throughout the lakes to enhance boating, fishing, hunting, public access and prevent spread to other areas of the lake to minimize adverse impacts to native plant populations, agricultural irrigation withdrawals, public drinking water withdrawals, and public use and access.

Control Crested floating heart populations throughout the lakes to enhance boating, fishing, hunting, public access and prevent spread to other areas of the lake to minimize adverse impacts to native plant populations, agricultural irrigation withdrawals, public drinking water withdrawals, and public use and access.

Control and eradicate giant salvinia populations throughout the lakes to enhance boating, fishing, hunting, public access and prevent spread to other areas of the lake to minimize adverse impacts to native plant populations, agricultural irrigation withdrawals, public drinking water withdrawals, and public use and access.

Reduce giant cutgrass populations throughout the lakes, especially in Wildlife Management Areas and upper Lake Marion, to enhance wildlife habitat and hunting opportunities.

Reduce crested floating heart, fragrant waterlily, American lotus and giant cutgrass populations throughout Wildlife Management Areas to enhance wildlife habitat and hunting opportunities.

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

Selected control method

Problem Species	Control Agents
Hydrilla	Endothall, Fluridone, Copper*, Komeen Crystal, ProcellaCOR-SC, Triploid grass carp
Algae	Copper*, Endothall, peroxygen compounds
Water hyacinth	Diquat, Triclopyr, Imazamox, 2,4-d, ProcellaCOR-SC
Giant Salvinia	Diquat, Triclopyr, 2,4-d Flumioxazin, Fluridone, Carfentrazone, Penoxsulam, Metsul furon-Methyl (Special Local Need Registration), salvinia weevils (*Cyrtobagous salviniae)*
Fanwort	Flumioxazin, Fluridone
Coontail, slender naiad, slender pondweed	Endothall, Fluridone, Diquat, Flumioxazin
Water primrose, alligatorweed, giant cutgrass	Glyphosate, Imazapyr, Triclopyr, Imazamox, Flumioxazin, ProcellaCOR-SC
Crested floating heart	Endothall, Imazamox / Glyphosate, Triclopyr/2,4-D, Fluridone, ProcellaCOR-SC, Flumioxazin

* 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 500 acres throughout the system but mostly in upper Lake Marion above I-95 Bridge.

Hydrilla - Release triploid grass carp near areas of the lake system with the greatest hydrilla growth and use herbicide applications to provide immediate short-term control of localized growth in those areas.

Crested floating heart - Approximately 2,000 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), and State and Federal wildlife management areas.

Giant cutgrass - Approximately 500 acres along shoreline areas throughout lake system, as well as within State and Federal wildlife management areas.

Other target species - Approximately 600+ 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.

Giant and Common Salvinia- Approximately 2,500 acres throughout the system, focusing on the most dense population above I-95 bridge.

Isolated Sub-Impoundments

Fountain Lake Impoundment, Dean's Swamp Impoundment, Church Branch Impoundment

The general management strategy is to transition from hydrilla dominated plant communities to ones dominated by a diversity of native plant species, which are beneficial to wildlife, by use of

aquatic herbicides. Specific control methods for the sub-impoundments will be determined co-operatively between Santee Cooper and SCDNR staffs.

Fountain Lake Impoundment - 53 acres - 800 triploid grass carp (15 per vegetated acre)
Dean's Swamp Impoundment - 100 acres - 1000 triploid grass carp (10 per vegetated acre)
Church Branch Impoundment – 80 acres - 800 triploid grass carp (10per vegetated acre)

Methods and goals will be 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

Endothall - 3.0-4.0 ppm (full water column treatment)
Tribune - 0.500 gallons per acre for floating plants; 2 gallons per acre for submersed plants.
Triclopyr - 0.375 to 0.750 gallons per acre for emergent species, per label for submersed plants.
Imazapyr - 0.250 to 0.750 gallons per acre.
Fluridone AS - 10 to 30 ppb.
*Copper- up to 1 ppm.
Glyphosate - up to 1.25 gallons per acre.
Fluridone Q, Fluridone PR, Fluridone One - up to 40 ppb (approx 10 pounds/acre).
Imazamox - 0.250 to 1.00 gallons per acre.
Triclopyr/2,4-D – up to 320 pounds per acre.
Komeen Crystal - 0.5-1.0 ppm

Metsulfuron-Methyl- 0.5-1.0 dry ounce per surface acre (refer to Special Local Need 24(c) registration)
ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.
Flumioxazin - 6-12 oz. per surface acre (not to exceed 400ppb)

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. The Aquatic Plant Management Council, with recommendations from SCDNR and Santee Cooper staff, agrees that the adaptive stocking plan should be continued, based on current observations of collected survey data, historical relevant data sets, and triploid grass carp surveys conducted jointly by SCDNR and Santee Cooper staff. The estimated grass carp population in 2020 was 38,172. Recent data indicates young grass carp are robust and in good condition, meaning that aquatic vegetation is abundant enough to keep the population well fed. This information supports maintaining the grass carp population near its current level, and annual stocking that offsets mortality is needed to accomplish this goal. Maintenance stocking of 10,000 grass carp has occurred annually since 2017, and this has moderated the decline in the grass carp population and diversified the age structure of the population. Stocking 10,000 sterile grass carp in the spring of 2021 will maintain a ratio of 1 grass carp per 5 surface acres of water (1:5 ratio). This ratio has thus far proved beneficial in slowing the expansion of hydrilla while also allowing for the expansion of native submerged vegetation.

Annual data should include estimates of hydrilla acreage, estimates of native vegetation acreage, and fall – based triploid grass carp surveys. Grass carp surveys should function to further assess the relative condition of the population and aid in yearly stocking decisions. All efforts will be made to determine an appropriate balance in the Santee Cooper system by maintaining control of hydrilla while promoting beneficial native vegetation. Herbicide treatments may be

utilized to provide temporary control of hydrilla when necessary. Changes to the strategy will be implemented if survey results, regrowth, or habitat loss warrant.

Method of application of control agents

Endothall, Copper, Fluridone, ProcellaCOR-SC, Komeen Crystal – Granular application, subsurface application by airboat or surface application by helicopter.

Diquat, ProcellaCOR-SC - (water hyacinth) spray on surface of foliage using handgun from airboat or by helicopter with appropriate surfactant; (submersed plants) subsurface application.

Salvinia weevil- Using industry standards for stocking while targeting areas of the lake with the greatest salvinia growth.

Triclopyr, Glyphosate, Imazapyr, Imazamox, ProcellaCOR-SC - spray on surface of foliage with appropriate surfactant.

Triclopyr/2,4-D – Distribute granular product evenly over the surface at the prescribed rate.

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 and hydrilla treatments should be initiated in spring when plant growth begins and continued regularly during the year as needed to reduce biomass as much as possible.

Triploid grass carp – 10,000, to be released as soon as possible in 2021.

Salvinia weevils- released as early as possible in 2021.

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.

Hydrilla, Giant Salvinia, Water hyacinth and Crested floating heart treatments will 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. Areas inaccessible by boat or large acreages will be treated aerially. Frequent treatments in these areas will be necessary to meet management objectives.

If available, all sterile grass carp will be a minimum of 10-12 inches in length. Sterile grass carp shipments for the Santee Cooper Lakes 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.

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

Estimated cost of control operations

$900,000

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 2021 and available funds provided by South Carolina Public Service Authority.

Potential sources of funding

S.C. Public Service Authority 100%

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 a minimum of 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 using federal and state approved control methods.

c) A long-term integrated adaptive 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 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.

Santee Cooper Area WMA's

31. Hatchery WMA

(Includes Pond1 adjacent to old ramp)

(Berkeley County)

Problem plant species

Crested Floating Heart, Cattails, Hydrilla, Water Primrose

Management objective

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

Selected control method

Problem Species	Control Agents
Crested Floating Heart	Triclopyr, Imazamox, Flumioxazin, ProcellaCOR-SC
Cattails	Imazapyr, Glyphosate, Imazamox
Hydrilla	Fluridone, ProcellaCOR-SC
Water Primrose	Imazapyr, Glyphosate, Triclopyr, Imazamox, ProcellaCOR-SC, Flumioxazin

Area to which control is to be applied

25 acres (Lake Moultrie), 3 acres (Pond 1)

Rate of control agent to be applied

Triclopyr/2,4-D – 200 lbs per acre.
Imazapyr – 0.500 – 0.750 gallons per acre.
Glyphosate – up to 0.937 gallons per acre.
Imazamox – up to 1 gallon per acre.
Flumioxazin – 2 oz/ac as an efficacy booster for foliar application, 5 to 12 oz/ac as a foliar application, submersed application 1 lb/ac foot.
Fluridone – up to 45 ppb
ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

Method of application of control agent

Foliar application using appropriate surfactant from airboat. Granular herbicides spread evenly using appropriate rate. Subsurface application using appropriate rate

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, SCDNR staff.

Estimated cost of control operations

$3,000

Potential sources of funding

Hatchery WMA 50%

SCDNR 50% (up to $30,000 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 using 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.

32. Hickory Top WMA (and Greentree Reservoir) (Clarendon County)

Problem plant species

Cutgrass, Cattails, Misc. Woody Species

Management objective

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

Selected control method

Imazapyr, Glyphosate, Imazamox

Area to which control is to be applied

30 acres

Rate of control agent to be applied

Imazapyr – 0.500 – 0.750 gallons per acre.
Glyphosate – up to 0.937 gallons per acre.
Imazamox – up to 1.000 gallon per acre.

Method of application of control agent

Foliar application using appropriate surfactant from airboat, ATV, or helicopter.

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, SCDNR staff.

Estimated cost of control operations

$4,000

Potential sources of funding

Hickory Top WMA 50%

SCDNR 50% (up to $30,000 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 using 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.

33. Potato Creek WMA (Clarendon County)

Problem plant species

Hydrilla, Water Hyacinth, Water Primrose, Bladderwort, Cutgrass, Lotus

Management objective

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

Selected control method

Problem Species	Control Agents
Hydrilla, Bladderwort, Lotus	Fluridone, ProcellaCOR-SC
Water Hyacinth	Triclopyr, Flumioxazin
Water Primrose, Lotus	Triclopyr, Imazapyr, Glyphosate, Imazamox, Flumioxazin
Cattails	Imazapyr, Glyphosate, Imazamox

Area to which control is to be applied

140 acres

Rate of control agent to be applied

Fluridone – up to 45 ppb.
Triclopyr - 0.500 – 0.750 gallons per acre.

Imazapyr – 0.500 – 0.750 gallons per acre.
Glyphosate – up to 0.937 gallons per acre.
Imazamox – up to 1.000 gallon per acre.
ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.
Flumioxazin – 2 oz/ac as an efficacy booster for foliar application.

Method of application of control agent

Foliar application using appropriate surfactant from airboat. Subsurface application spread evenly using appropriate rate.

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, SCDNR staff.

Estimated cost of control operations

$1,500

Potential sources of funding

Potato Creek WMA 50%

SCDNR 50% (up to $30,000 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 using 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

34. Sandy Beach WMA (Berkeley County)

Problem plant species

Crested Floating Heart, Cattails, Cutgrass, Lotus, Water Primrose, Misc. Woody Species, Hydrilla

Management objective

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

Selected control method

Problem Species	Control Agents
Crested Floating Heart	Imazamox, Flumioxazin, ProcellaCOR-SC
Cattails, Cutgrass, Misc. Woody Species	Imazapyr, Glyphosate, Imazamox
Lotus, Water Primrose	Triclopyr, 2,4-d, Flumioxazin
Hydrilla	Fluridone, ProcellaCOR-SC (ditches within WMA)

Area to which control is to be applied

40 acres

Rate of control agent to be applied

Triclopyr – 0.500 – 0.750 gallons per acre.
Imazapyr – 0.500 – 0.750 gallons per acre.
Glyphosate – up to 0.937 gallons per acre.
Imazamox – up to 1.000 gallon per acre.
Flumioxazin – 2 oz/ac as an efficacy booster for foliar application, up to 0.750 lbs per acre for submersed application.
2,4-d – up to 1.000 gallon per acre.
Fluridone – up to 45 ppb.
ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

Method of application of control agent

Foliar application using appropriate surfactant 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, SCDNR staff.

Estimated cost of control operations

$6,000

Potential sources of funding

Sandy Beach WMA 50%

SCDNR 50% (up to $30,000 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 using 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

35. Santee Cooper WMA (Orangeburg County)

Problem plant species

Crested Floating Heart, Cattails, Cutgrass, Lotus, Water Primrose, Misc. Woody Species, Water lily

Management objective

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

Selected control method

Problem Species	Control Agents
Crested Floating Heart, Water lily	Imazamox, Flumioxazin, ProcellaCOR-SC
Cattails, Cutgrass, Misc. Woody Species, Water lily	Imazapyr, Glyphosate, Imazamox
Lotus, Water Primrose	Triclopyr, 2,4-d, Flumioxazin

Area to which control is to be applied

100 acres on multiple waterbodies based on priority.

Rate of control agent to be applied

Triclopyr – 0.500 – 0.750 gallons per acre.
Imazapyr – 0.500 – 0.750 gallons per acre.
Glyphosate – up to 0.937 gallons per acre.
Imazamox – up to 1.000 gallon per acre.
Flumioxazin – 2 oz/ac as an efficacy booster for foliar application, submersed application up to 0.750 lbs per acre.
2,4-d – up to 1.000 gallon per acre.
ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

Method of application of control agent

Foliar application using appropriate surfactant from airboat or helicopter

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, SCDNR staff.

Estimated cost of control operations

$25,000

Potential sources of funding

Santee Cooper WMA 50%

SCDNR 50% (up to $30,000 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 using 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 Department of Parks, Recreation and Tourism State Park Lakes (SCPRT)

36. Aiken State Park (Aiken County)

Problem plant species

Floating Heart, Cattails, Lemon Bacopa, Watershield

Management objective

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

Selected control method

Problem Species	Control Agents
Floating Heart	Triclopyr/2,4-D, ProcellaCOR-SC
Cattails	Imazapyr, Glyphosate
Watershield	2,4-D, Triclopyr OTF, Triclopyr/2,4-D, ProcellaCOR-SC, Flumioxazin
Lemon Bacopa	ProcellaCOR-SC

Area to which control is to be applied

10 acres in three lakes

Rate of control agent to be applied

Triclopyr/2,4-D – 200 lbs per acre.
Imazapyr – 0.500 – 0.750 gallons per acre.
Glyphosate – up to 0.937 gallons per acre.
ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

Method of application of control agent

Foliar application using appropriate surfactant from airboat. Granular herbicides spread evenly using appropriate rate.

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 monitored by SCPRT.

Estimated cost of control operations

$6,000

Potential sources of funding

SCPRT 50%

SCDNR 50% (up to $30,000 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 using 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.

37. Barnwell State Park (Swimming Lake) (Barnwell County)

Problem plant species

Waterlily, Cattails, Pondweed, Maidencane

Management objective

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

Selected control method

Problem Species	Control Agents
Waterlily, Pondweed	Triclopyr/2,4-D, ProcellaCOR-SC
Cattails, Maidencane	Imazapyr, Glyphosate

Area to which control is to be applied

3 acres in swimming lake.
6 acres in Upper lake.

Rate of control agent to be applied

Triclopyr/2,4-D – 200 lbs per acre.
Imazapyr – 0.500 – 0.750 gallons per acre.
Glyphosate – up to 0.937 gallons per acre.
ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

Method of application of control agent

Foliar application using appropriate surfactant from airboat. Granular herbicides spread evenly using appropriate rate.

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 monitored by SCPRT.

Estimated cost of control operations

$6,000

Potential sources of funding

SCPRT 50%

SCDNR 50% (up to $30,000 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 using 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.

38. Charles Towne Landing State Park (Charleston County)

Problem plant species

Duckweed, Alligatorweed, Pennywort, Cyanobacteria, Algae

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, Flumioxazin, Penoxsulam
Alligatorweed	Triclopyr, Imazapyr, Imazamox, Glyphosate, ProcellaCOR-SC, Flumioxazin
Pennywort	Triclopyr, Imazapyr, Imazamox, Glyphosate, ProcellaCOR-SC
Algae (planktonic)	*Copper

Area to which control is to be applied

Fluridone, Penoxsulam - 3 acres

Triclopyr, Imazapyr, Imazamox, Glyphosate, ProcellaCOR-SC, Flumioxazin - 4 acres

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

Rate of control agents to be applied

Fluridone - 0.125 gallons per acre.
Imazapyr – 0.250 – 0.750 gallons per acre.
Imazamox – 0.500 – 0.750 gallons per acre.
Glyphosate - up to 0.937 gallons per acre.
Renovate - 0.500 to 0.750 gallons per acre.
Flumioxazin – 2 oz/ac as an efficacy booster for foliar application, submersed application up to 0.09375 gallons per acre.
Penoxsulam - 2 to 12 fl oz per acre.

*Copper- up to 1 ppm.

Method of application of control agents

Fluridone, Penoxsulam - Apply subsurface throughout lake

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

ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

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 monitored by SCPRT.

Estimated cost of control operations

$4,000

Potential sources of funding

SCPRT 50%

SCDNR 50% (up to $30,000 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 using 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.

39. Cheraw State Park (Lake Juniper) (Chesterfield County)

Problem plant species

Floating heart, Waterlily, Spatterdock, Watermilfoil

Management objective

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

Selected control method

Problem Species	Control Agents
Floating heart, Waterlily, Spatterdock, Watermilfoil	Triclopyr/2,4-D, ProcellaCOR-SC, Flumioxazin
Floating heart, Spatterdock	Imazapyr, Glyphosate, Flumioxazin

Area to which control is to be applied

10 acres along boardwalk, main swimming area, and swimming areas at Camps Forest & Juniper

Rate of control agent to be applied

Triclopyr/2,4-D – 200 lbs per acre.
Imazapyr – 0.500 – 0.750 gallons per acre.
Glyphosate – up to 0.937 gallons per acre.
ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.
Flumioxazin – 2 oz/ac as an efficacy booster for foliar application.

Method of application of control agent

Foliar application using appropriate surfactant from airboat. Granular herbicides spread evenly using appropriate rate.

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 monitored by SCPRT.

Estimated cost of control operations

$6,000

Potential sources of funding

SCPRT 50%

SCDNR 50% (up to $30,000 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 using 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.

40. Croft State Park (Spartanburg 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

Area to which control is to be applied

50 acres

Rate of control agent to be applied

Triploid Grass Carp – 125 fish

Method of application of control agent

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

Triploid grass carp to be released as soon as possible in the spring of 2021 (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.

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.

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

$1,200

Potential sources of funding

SCPRT 50%

SCDNR 50% (up to $30,000 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 using 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.

41. H. Cooper Black State Recreation Area (Chesterfield County)

Problem plant species

Waterlily, Watershield, Spatterdock

Management objective

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

Selected control method

2,4-D, Imazapyr, Imazamox, Glyphosate, ProcellaCOR-SC, Flumioxazin

Area to which control is to be applied

2 acres in lake.

Rate of control agent to be applied

Imazapyr – 0.250 – 0.750 gallons per acre.
Imazamox – 0.500 – 0.750 gallons per acre.
Glyphosate - up to 0.937 gallons per acre.
2,4-D – up to 5 gallons per acre.
ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.
Flumioxazin – 2 oz/ac as an efficacy booster for foliar application.

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 monitored by SCPRT.

Estimated cost of control operations

$375

Potential sources of funding

SCPRT 50%

SCDNR 50% (up to $30,000 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 using 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.

42. Hunting Island State Park
(Beaufort County)

Problem plant species

Duckweed, Parrot's feather

Management objective

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

Selected control method

Fluridone, Flumioxazin, Penoxsulam, ProcellaCOR-SC

Area to which control is to be applied

1 acres adjacent to the parks use area

Rate of control agent to be applied

Fluridone - 0.125 gallons per acre.
Flumioxazin –2 oz/ac as an efficacy booster for foliar application, 5 to 12 oz/ac as a foliar application, submersed application 1 lb/ac foot.
Penoxsulam - 2 to 12 fl oz per acre.
ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

Method of application of control agent

Herbicide - Spray on surface of foliage with appropriate surfactant or subsurface injection broadcast evenly 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 monitored by SCPRT.

Estimated cost of control operations

$1,200

Potential sources of funding

SCPRT 50%

SCDNR 50% (up to $30,000 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 using 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.

43. 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

Imazapyr, Imazamox, Glyphosate

Area to which control is to be applied

10 acres in 3 different lakes.

Rate of control agent to be applied

Imazapyr - 0.500 – 0.750 gallons per acre.

Imazamox - 0.500 – 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons 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 monitored by SCPRT.

Estimated cost of control operations

$1,100

Potential sources of funding

SCPRT 50%

SCDNR 50% (up to $30,000 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 using 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.

44. Kings Mountain State Park - Crawford Lake, Lake York (York County)

Problem plant species

Slender naiad, Misc. species

Management objective

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

Selected control method

Endothall
Flumioxazin
Triploid Grass Carp

Area to which control is to be applied

4 acres in swimming and paddle boat area, Crawford Lake
Entirety of Lake York

Rate of control agent to be applied

Endothall - Four (4) gallons per acre.
Flumioxazin – 1.6 pounds per acre foot.
Triploid Carp – 15 fish per vegetated acre.

Method of application of control agent

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

Timing and sequence of control application

Apply in May or June when naiad growth is initiated.
Triploid grass carp to be released as soon as possible in the spring of 2021 (March-May). RESULTS FROM GRASS CARP MAY NOT BE EVIDENT FOR TWO OR MORE YEARS.

Other control application specifications

Monitor plant growth prior to treatment. 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

Commercial applicator monitored by SCPRT.

Estimated cost of control operations

$2,000

Potential sources of funding

SCPRT 50%

SCDNR 50% (up to $30,000 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 using 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.

45. Lee State Park
(Lee County)

Problem plant species

Watermilfoil

Management objective

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

Selected control method

Triclopyr/2,4-D, ProcellaCOR-SC

Area to which control is to be applied

3 acres adjacent to the park's day use area, along the park dam and adjacent to the campground

Rate of control agent to be applied

Triclopyr/2,4-D - 200 lbs per acre.
ProcellaCOR-SC - 1-5 PDUs per acre foot

Method of application of control agent

Herbicide - Spray on surface of foliage with appropriate surfactant. Granular broadcast evenly 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 monitored by SCPRT.

Estimated cost of control operations

$1,810

Potential sources of funding

SCPRT 50%

SCDNR 50% (up to $30,000 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 using 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.

46. Little Pee Dee State Park
(Dillon County)

Problem plant species

Spatterdock, Water lily, Watershield, Spikerush

Management objective

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

Selected control method

Triclopyr/2,4-D-, Imazamox, Glyphosate, Imazapyr, ProcellaCOR-SC, Flumioxazin

Area to which control is to be applied

15 acres adjacent to the park's day use area, along the park dam and adjacent to the campground

Rate of control agent to be applied

Triclopyr/2,4-D - 200 lbs per acre.
Imazamox – 0.500 – 0.750 gallons per acre.
Imazapyr - 0.500 – 0.750 gallons per acre.
Glyphosate – up to 0.937 gallons per acre.
ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.
Flumioxazin – 2 oz/ac as an efficacy booster for foliar application.

Method of application of control agent

Herbicide - Spray on surface of foliage with appropriate surfactant. Granular broadcast evenly 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 monitored by SCPRT.

Estimated cost of control operations

$3,000

Potential sources of funding

SCPRT 50%

SCDNR 50% (up to $30,000 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 using 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.

47. 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

2,4-D, Triclopyr/2,4-D, ProcellaCOR-SC, Flumioxazin

Area to which control is to be applied

60 acres in lake.

Rate of control agent to be applied

2,4-D - Up to 5 gallons per acre.
Triclopyr/2,4-D – 200 lbs per acre.
ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.
Flumioxazin – 2 oz/ac as an efficacy booster for foliar application.

Method of application of control agent

Herbicide - Spray on surface of foliage with appropriate surfactant. Granular broadcast evenly 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 monitored by SCPRT.

Estimated cost of control operations

$3,000

Potential sources of funding

SCPRT 50%

SCDNR 50% (up to $30,000 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 using 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.

48. Paris Mountain State Park (Greenville County)

Problem plant species

Slender Naiad, Watershield, Pondweed

Management objective

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

Selected control method

Triclopyr/2,4-D, Imazamox, Glyphosate, Imazapyr

Area to which control is to be applied

Lake Placid: slender naiad 5 acres - Treat with grass carp

Lake Buckhorn: Watershield, pondweed treat 1 acre

Rate of control agent to be applied

Triploid Grass Carp – 15 fish per vegetated acre

Triclopyr/2,4-D - 200 lbs per acre.

Method of application of control agent

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

Herbicide - Spray on surface of foliage with appropriate surfactant. Granular broadcast evenly from airboat.

Timing and sequence of control application

Triploid grass carp to be released as soon as possible in the spring of 2021 (March-May). RESULTS FROM GRASS CARP MAY NOT BE EVIDENT FOR TWO OR MORE YEARS.

Herbicide - Apply when plants are actively growing.

Other control application specifications

Monitor plant growth prior to treatment. 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

Commercial applicator monitored by SCPRT.

Estimated cost of control operations

$1,300

Potential sources of funding

SCPRT 50%

SCDNR 50% (up to $30,000 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 using 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.

49. Poinsett State Park (Sumter County)

Problem plant species

Spatterdock, Cattails

Management objective

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

Selected control method

Imazapyr, Glyphosate, Imazamox, Triclopyr/2,4-D, ProcellaCOR-SC, Flumioxazin

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

Imazamox - Up to 1 gallon per acre.
Imazapyr - Up to 0.750 gallons per acre.
Glyphosate - Up to 0.750 gallons per acre.
Triclopyr/2,4-D – 200 lbs per acre.
ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.
Flumioxazin – 2 oz/ac as an efficacy booster for foliar application.

Method of application of control agent

Herbicide - Spray on surface of foliage with appropriate surfactant. Granular broadcast evenly 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 monitored by SCPRT.

Estimated cost of control operations

$1,500

Potential sources of funding

SCPRT 50%

SCDNR 50% (up to $30,000 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 using 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.

50. Sesquicentennial State Park (Richland County)

Problem plant species

Waterlily, Watershield, Fanwort

Management objective

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

Selected control method

2,4-D, Triclopyr/2,4-D ProcellaCOR-SC, Flumioxazin

Area to which control is to be applied

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

Rate of control agent to be applied

2,4-D - Up to 5 gallons per acre.
Triclopyr/2,4-D – 200 lbs per acre.
ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.
Flumioxazin –2 oz/ac as an efficacy booster for foliar application, submersed application 1-3 pounds per acre foot.

Method of application of control agent

Herbicide - Spray on surface of foliage with appropriate surfactant. Granular broadcast evenly 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 monitored by SCPRT.

Estimated cost of control operations

$3,000

Potential sources of funding

SCPRT 50%

SCDNR 50% (up to $30,000 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 using 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 Department of Natural Resources
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*Total price and cost share is for herbicide costs only based on state contract costs. Freshwater Fisheries staff will apply based on label rates.

51. 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

Triclopyr, Flumioxazin

Area to which control is to be applied

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

Rate of control agent to be applied

Triclopyr - 0.500 - 0.750 gallons per acre.

Flumioxazin – 2 oz/ac as an efficacy booster for 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.

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

$*

Potential sources of funding

SCDNR (WFF division) 100%

SCDNR 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 using 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.

52. 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	Triclopyr, Flumioxazin
Pondweed	Komeen/Diquat
Hydrilla	Triploid Grass Carp, Komeen/Diquat, ProcellaCOR-SC

Rate of control agent to be applied

Triclopyr - 0.500 – 0.750 gallons per acre.

Komeen/Diquat - 4 gallons per acre / 2 gallons per acre.

ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

Flumioxazin – 2 oz/ac as an efficacy booster for foliar application.

Triploid Grass Carp – 25 fish per vegetated acre.

Area to which control is to be applied

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

Hydrilla/Pondweed - 4 acres in lake two (2) times per year.

If conditions warrant, release triploid grass carp in close proximity to areas of the lake with the greatest problematic growth and use herbicide applications to provide immediate short-term control of localized growth in those areas. 100 Triploid Carp

Method of application of control agent

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

Apply 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

$*

Potential sources of funding

SCDNR (WFF division) 100%

SCDNR 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 using 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.

53. 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

Triclopyr, Glyphosate, Flumioxazin

Area to which control is to be applied

10 acres in lake.

Rate of control agent to be applied

Triclopyr - 0.500 – 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre.

Flumioxazin – 2 oz/ac as an efficacy booster for 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.

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

$*

Potential sources of funding

SCDNR (WFF division) 100%

SCDNR 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 using 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.

54. 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

Triclopyr, Glyphosate, Flumioxazin

Area to which control is to be applied

5 acres in lake.

Rate of control agent to be applied

Triclopyr - 0.500 - 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre.

Flumioxazin – 2 oz/ac as an efficacy booster for 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.

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

$*

Potential sources of funding

SCDNR (WFF division) 100%

SCDNR 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 using 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.

55. 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

Triclopyr, Glyphosate, Flumioxazin

Area to which control is to be applied

8 acres in lake.

Rate of control agent to be applied

Triclopyr - 0.500 - 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre.

Flumioxazin – 2 oz/ac as an efficacy booster for 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.

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

$*

Potential sources of funding

SCDNR (WFF division) 100%

SCDNR 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 using 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.

56. 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 - up to 0.937 gallons 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

$*

Potential sources of funding

SCDNR (WFF division) 100%

SCDNR 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 using 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.

57. 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

Triclopyr/2,4-D, ProcellaCOR-SC, Flumioxazin

Area to which control is to be applied

<5 acres of spotty coverage

Rate of control agent to be applied

Triclopyr/2,4-D - 200 pounds per acre

ProcellaCOR-SC - 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

Flumioxazin – 2 oz/ac as an efficacy booster for 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.

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

$*

Potential sources of funding

SCDNR (WFF division) 100%

SCDNR 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 using 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.

58. Lake Edgar Brown (Barnwell County)

Problem plant species

Water primrose, Coontail, water hyacinth

Management objective

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities. Control efforts will extend into the Turkey Creek area adjacent to the Barnwell Hatchery.

Selected control method

Water Primrose - Imazapyr, Glyphosate, Triclopyr, Flumioxazin

Water Hyacinth - Imazapyr, Glyphosate, Triclopyr, Flumioxazin, ProcellaCOR-SC

Coontail - Diquat

Area to which control is to be applied

60 acres in lake.

Rate of control agent to be applied

Imazapyr - up to 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre.

Triclopyr – 0.500 - 0.750 gallons per acre.

ProcellaCOR-SC – 1-5 PDUs per acre foot for submersed application, 1-2 PDUs per acre for foliar application.

Flumioxazin – 2 oz/ac as an efficacy booster for foliar application, submersed application 1 lb/ac foot.

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

$*

Potential sources of funding

SCDNR (WFF division) 100%

SCDNR 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 using 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.

59. Lake George Warren
(Hampton County)

Problem plant species

Water primrose, Cattails, Coontail, Naiad

Management objective

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

Selected control method

Glyphosate, Imazapyr, Triploid Grass Carp

Area to which control is to be applied

20 acres in lake.

Rate of control agent to be applied

Glyphosate - up to 0.937 gallons per acre.

Imazapyr - 0.250 - 0.500 gals/ac

If conditions warrant, release triploid grass carp in close proximity to areas of the lake with the greatest problematic growth and use herbicide applications to provide immediate short-term control of localized growth in those areas.

Method of application of control agent

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

Apply 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

$*

Potential sources of funding

SCDNR (WFF division) 100%

SCDNR 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 using 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.

60. 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, 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

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.

Copper* - up to 1 ppm

Glyphosate- up to 1 gallon per acre.

Method of application of control agents

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

$*

Potential sources of funding

SCDNR (WFF division) 100%

SCDNR 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 using 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.

61. Dargan's Pond
(Darlington 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, Triploid Grass Carp

Area to which control is to be applied

15 acres in lake.

Rate of control agent to be applied

Glyphosate - up to 0.937 gallons per acre.

Triploid Grass Carp – 25 fish per vegetated acre

Method of application of control agents

Glyphosate - 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

$*

Potential sources of funding

SCDNR (WFF division) 100%

SCDNR 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 using 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.

62. Lake Paul Wallace (Marlboro County)

Problem plant species

Hydrilla, Naiad

Management objective

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

Selected control method

Fluridone, Triploid Grass Carp

Area to which control is to be applied

200 acres in lake.

Rate of control agent to be applied

Fluridone – up to 30 ppb in treatment area

Triploid Grass Carp – 25 fish per vegetated acre

Method of application of control agents

Fluridone – Granular or 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

$*

Potential sources of funding

SCDNR (WFF division) 100%

SCDNR 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 using 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.

63. 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

Recommendation for supplemental grass carp stocking in the spring of 2021. Because of the loss of sterile grass carp to mortality (disease, predation, fishing, bow hunting, etc.) we recommend 576 grass carp, be stocked in the lake during the spring of 2021. This is a supplemental stocking of 32% (average of national grass carp annual mortality curves, Phil Kirk pers. com.) of the original 1800 grass carp introduced in 2009. Duke Energy will continue to monitor the effectiveness of the introduced fish.

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 2021 (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 Energy

Drawdown - Duke Energy

Potential sources of funding

Duke Energy 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.

64. Lake Thurmond (South Carolina - Georgia)

Lake Thurmond is a U.S. Army Corps of Engineers (USACOE) lake which borders South Carolina and Georgia. The control and maintenance issues associated with this lake fall under the jurisdiction of the USACOE. The USACOE coordinates with both Georgia and SC natural resource agencies on a variety of issues that affect natural resource management. A consensus has not been reached by the entities involved on management activities for invasive species, specifically hydrilla. Ongoing meetings and correspondence will continue on this and many other subjects.

NOTE: The following description is not binding for management activities but represents the Aquatic Plant Management Council's opinion on managing hydrilla in Lake Thurmond.

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

Drawdown - To the greatest extent possible within project limits.

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.

Drawdown - Draw lake down

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. 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 Thurmond will be continued using mortality estimates derived from the population and population models.

Drawdown - Drawdown lake from October through February.

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.

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

Estimated cost of control operations

No estimate available

Entity to apply control agent

Herbicide application - Commercial applicator or USACOE

Drawdown - USACOE

Potential sources of funding

USACOE 100%

Long term management strategy

a) Manage hydrilla's potential adverse impacts to the Lake Thurmond 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 Thurmond and the use of age-structure population models developed for fisheries.

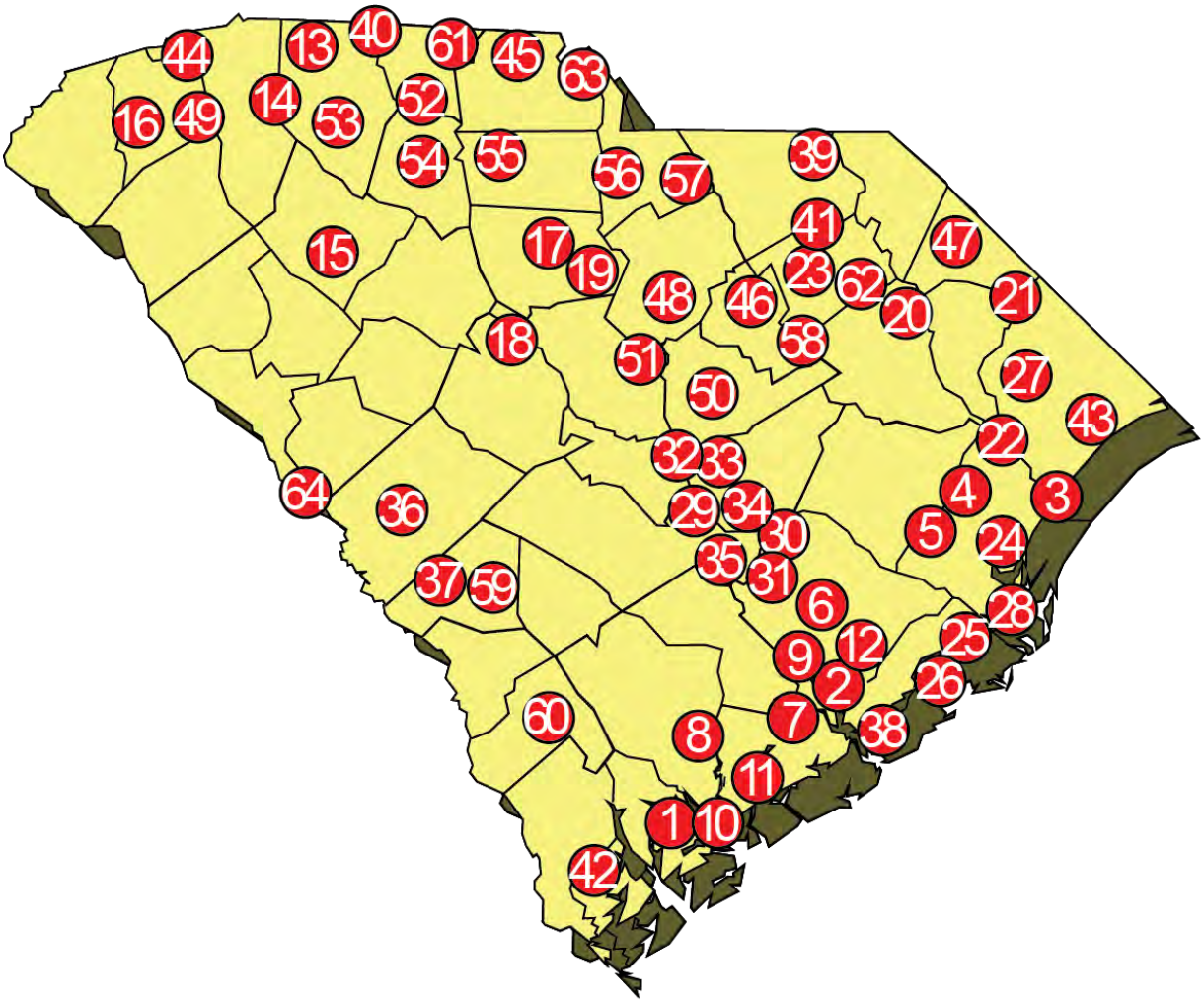
Summary of Proposed Management Operation Expenditures for 2021-2022

	Water Body Name	Total Cost	Local	State	Federal	Local Sponsor
1	Ashepoo	$25,000	$12,500	$12,500	$0	Colleton County
2	Back River Reservoir	$45,000	$22,500	$22,500	$0	Dominion Energy, CPW
3	Baruch	$5,000	$2,500	$2,500	$0	Baruch
4	Black Mingo Creek	$1,000	$500	$500	$0	Georgetown Co.
5	Black River	$3,250	$1,625	$1,625	$0	Nature Conservancy
6	Bonneau Ferry WMA	$5,750	$2,875	$2,875	$0	SCDNR
7	Charleston Co. Parks	$1,000	$500	$500	$0	Charleston Parks
8	Combahee River	$700	$350	$350	$0	Colleton Co.
9	Cooper River	$42,000	$21,000	$21,000	$0	Berkeley Co.
10	Donnelley/ACE Basin	$10,000	$2,500	$5,000	$2,500	SCDNR, USF&W, Nature Conservancy
11	Dungannon WMA	$2,000	$1,000	$1,000	$0	SCDNR, USF&W
12	Goose Creek Reservoir	$34,500	$17,250	$17,250	$0	CPW
13	Lake Bowen	$30,000	$15,000	$15,000	$0	Spartanburg CPW
14	Lake Cunningham	$1,500	$750	$750	$0	Greer CPW
15	Lake Greenwood	$10,000	$5,000	$5,000	$0	Greenwood Co.
16	Lake Keowee	$3,600	$1,800	$1,800	$0	Duke Energy
17	Lake Monticello (Rec. Lake)	$250	$250	$0	$0	Dominion Energy
18	Lake Murray	$16,000	$8,000	$8,000	$0	Dominion Energy, Lex. & Rich. Cos.
19	Lake Wateree	$0	$0	$0	$0	Duke Energy
20	Little Pee Dee River	$1,500	$750	$750	$0	Horry & Marion Cos.
21	Lumber River	$500	$250	$250	$0	Horry & Marion Cos.
22	Pee Dee River	$3,500	$1,750	$1,750	$0	Georgetown Co.
23	Prestwood Lake	$3,000	$1,500	$1,500	$0	City of Hartsville
24	Samworth WMA	$5,000	$2,500	$2,500	$0	SCDNR
25	Santee Coastal Reserve	TBD	TBD	TBD	$0	SCDNR
26	Santee Delta WMA	$1,500	$750	$750	$0	SCDNR
27	Waccamaw River	$20,000	$10,000	$10,000	$0	USF&W/Horry Co.
28	Yawkey Wildlife Center	$3,850	$1,925	$1,925	$0	SCDNR
	Santee Cooper Lakes					
29	Lake Marion	$600,000	$600,000	$0	$0	Santee Cooper
30	Lake Moultrie	$300,000	$300,000	$0	$0	Santee Cooper
	Santee Cooper Area WMA's					
31	Hatchery WMA	$3,000	$1,500	$1,500	$0	SCDNR
32	Hickory Top WMA	$4,000	$2,000	$2,000	$0	SCDNR
33	Potato Creek WMA	$1,500	$750	$750	$0	SCDNR
34	Sandy Beach WMA	$6,000	$3,000	$3,000	$0	SCDNR

35	Santee Cooper WMA	$25,000	$12,500	$12,500	$0	SCDNR
	State Parks					
36	Aiken State Park	$6,000	$3,000	$3,000	$0	SCPRT
37	Barnwell SP	$6,000	$3,000	$3,000	$0	SCPRT
38	Charlestown Landing SP	$4,000	$2,000	$2,000	$0	SCPRT
39	Cheraw SP	$6,000	$3,000	$3,000	$0	SCPRT
40	Croft SP	$1,200	$600	$600	$0	SCPRT
41	H Cooper Black SP	$375	$188	$188	$0	SCPRT
42	Hunting Island SP	$1,200	$600	$600	$0	SCPRT
43	Huntington Beach SP	$1,100	$550	$550	$0	SCPRT
44	Kings Mountain SP	$2,000	$1,000	$1,000	$0	SCPRT
45	Lee SP	$1,810	$905	$905	$0	SCPRT
46	Little Pee Dee SP	$3,000	$1,500	$1,500	$0	SCPRT
47	NR Goodale	$3,000	$1,500	$1,500	$0	SCPRT
48	Paris Mountain SP	$1,300	$650	$650	$0	SCPRT
49	Poinsett SP	$1,500	$750	$750	$0	SCPRT
50	Sesquicentennial SP	$3,000	$1,500	$1,500	$0	SCPRT
*	51-62 done entirely by SCDNR State Lakes Program, budget not provided					
	63-64 are border lakes with either Federal or other State jurisdictions, budget not provided					
	SCDNR Total	$314,900	$155,075	$156,325	$2,500	
	State Park Lake Total	$41,485	$20,743	$20,743	$0	
	Santee Cooper Total	$900,000	$900,000	$0	$0	
	SCDNR/State Parks Total	**$356,385**	**$175,818**	**$177,068**	**$2,500**	
	Grand Total	**$1,256,385**	**$1,075,818**	**$177,068**	**$2,500**	

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 2021 (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.

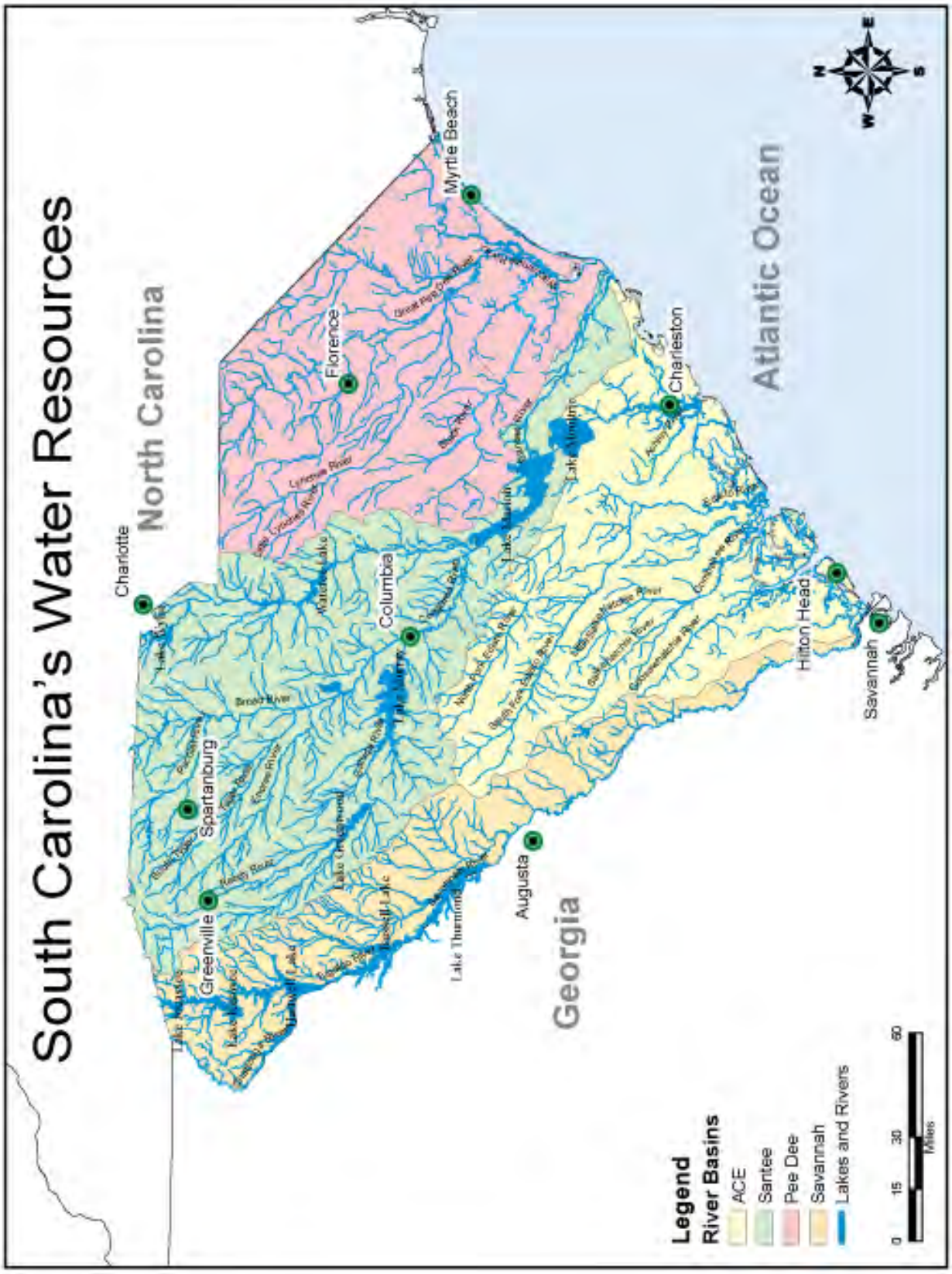
Location of 2021 Management Sites



Appendices

APPENDIX A

Major River Basins in South Carolina



APPENDIX B

Additional Documentation for NPDES General Permit

NPDES Required Information Details

Aquatic Nuisance Species Program Emergency Numbers

SCDNR Columbia Office 803-734-4016	Chemical Spill/Fish Kill Emergency Number (SCDHEC) 888-481-0125	Clemson Department of Pesticide Regulation 864-646-2150
SCDNR Emergency Number 800-922-5431	SCDHEC Statewide Fish Kill Coordinator - Jim Rice 803-896-4114(O) 803-960-0539(C)	Poison Control Hotline 800-222-1222
Radio Room – Law Enforcement 803-955-4000		National Response Center 800-424-8802
Chris Page SCDNR Program Manager ANS Program 2730 Fish Hatchery Road West Columbia, SC 29172 803-755-2836 Voice 803-600-7541 Cell	Julie Holling SCDNR Field Supervisor ANS Program 2730 Fish Hatchery Road West Columbia, SC 29172 803-755-2872 Voice 803-528-4720 Cell	John Crabb President Estate Management Services 305 Indigo Drive Brunswick, GA 31525 Toll-Free: 888-307-6637 Phone: 912-466-9800

DNR Region	Counties	Freshwater Fisheries Fish Kills	Wildlife Problems	Law Enforcement	Marine Resources
Region I (Clemson) 311 Natural Resources Drive Clemson, SC 29631 (864) 654-1671	Oconee, Pickens, Greenville, Spartanburg, Anderson, Laurens, Abbeville, Greenwood, Union, Cherokee, McCormick, and Edgefield	Dan Rankin 864-986-6246 864-982-2175 (Cell)	Pat Cloninger 864-986-6248 864-506-5402 (Cell)	CPT DJ Riley 864-654-8266 864-982-1785 (Cell)	Saltwater Fish Kills Only
Region II (Florence) 295 S. Evander Drive Florence, SC 29506 (843) 661-4766	York, Chester, Fairfield, Lancaster, Kershaw, Lee, Chesterfield, Marlboro, Darlington, Dillon, Florence, Marion, Williamsburg	Robert Stroud 803-366-7024 803-609-7018 (Cell)	Sam Stokes 843-661-4768 843-870-3771 (Cell)	CPT Matt McCaskill 864-661-4766 843-616-3777 (Cell)	Saltwater Fish Kills Only
Region III (Columbia) PO Box 167 1000 Assembly St. Columbia, SC 29202 (803) 734-4303	Newberry, Saluda, Aiken, Lexington, Richland, Calhoun, Orangeburg, Barnwell, Allendale, Bamberg, Sumter, Clarendon	Jason Bettinger 803-353-8232 803-904-6710 (Cell)	Willie Simmons 803-734-3898 803-609-7010 (Cell)	CPT Ken Simmons 803-755-1822 803-609-6924 (Cell)	Saltwater Fish Kills Only
Region IV (Charleston) PO Box 12559 217 Ft. Johnson Rd. Charleston, SC 29412 (843) 953-9307	Horry, Hampton, Georgetown, Berkeley, Charleston, Dorchester, Colleton, Jasper, Beaufort	Vacant 843-825-3387 843-870-5807 (Cell)	Alicia Farrell 843-953-5291 843-729-1955 (Cell)	CPT Henry Stackhouse 843-953-9307 843-870-5629 (Cell)	Mike Denson 843-953-9819 843-214-8178 (Cell)

Pest Management Area Description

(See AQUATIC PLANT MANAGEMENT STRATEGY section for Specific Water body.)

Control Measure Description

(See AQUATIC PLANT MANAGEMENT STRATEGY section for Specific Water body.)

Schedules and Procedures

(See AQUATIC PLANT MANAGEMENT STRATEGY section for Specific Water body.)

PESTICIDE SPILL POLICY AND PROCEDURES

a. Put on protective clothing as may be appropriate: rubber boots, aprons, gloves, mask, and respirator. Use special caution if two different materials are spilled and mix together. They may react chemically to form noxious fumes.
b. Immediately contain the spill. Use absorbents, dikes, mops or brooms, dirt or sand to retard the spread of the spill.
c. Notify your Contacts listed above or person in charge.
d. Recover the spill into containers (usually 5-gallon buckets or 30-gallon drums). Each warehouse should have at least one clean, empty 30-gallon drum for the purpose.
e. After sealing each recovered material container, mark it or attach a tag clearly to identify its contents, approximate quantity and date.
f. Move containers of spilled materials to a secure area.
g. Prepare a spill report giving relevant information including date; location; material spilled; approximate quantity; actions taken; location of recovered material; cause or circumstances leading to spill; and recommendations on how to avoid this problem in the future.
h. Contact the office for disposal instructions.

DO NOT USE OR DISPOSE OF SPILLED MATERIALS WITHOUT PRIOR REVIEW.

i. Depending on the circumstances, the best disposal method will differ. Some potential alternatives are:
    1. Use in the normal course of business;
    2. Dilute and wash into sanitary sewer;
    3. Shipment to an approved hazardous waste facility; neutralization / detoxification on site.
    4. Since a decision on how best to dispose of a spill may be quite complex, we may want input from manufacturers, regulatory officials or technical advisors. Consult the office before acting.

SPILL RESPONSE

Purpose: To ensure the safety of all individuals participating in or affected by herbicide use, to minimize the SCDNR's and Contractor's exposure to liability, to ensure the appropriate and effective application of herbicides as a management tool, and to minimize detrimental effects to the environment.

The following information will be provided following the discovery and initial telephonic reporting of the spill:	
1.	Time spill occurred or was first observed: _____
2.	Name of person first observing spill: _____
3.	Location of initial spill and present location if moving: * _____
4.	Type of spilled material: _____
5.	Estimate of amount spilled or rate of release if continuing: _____
6.	Environmental conditions e.g., wind direction and speed, wave action, and currents: _____
7.	If from mobile container (e.g., 2.5, 5, 15, 30, 55, tote): _____
8.	Description of area likely to be affected by spill --e.g., riverbanks, lakes, land areas, wildlife areas: _____ _____
9.	Cause of spill, if determined: _____
10.	Action taken to combat spill, if any: _____ _____ _____
11.	Activities or authorities notified: _____ _____ _____
12.	_____ ***Please provide lat/long and attach detailed map of spill area if possible**.

SPILL KIT CONTENTS

A spill kit is required to be assembled and placed in locations where pesticides are mixed, and on vehicles, which transport pesticides.

Shop Kit Quantity	Vehicle Kit Quantity	Item
1 (55 gal)	1 (5 gal)	open-head drum
1	1	pesticide spill policy and procedures
4	2	pairs of nitrile gloves
2	1	pairs of unvented goggles
2	1	respirator and pesticide cartridges
2	1	aprons (chemical resistant)
2	1	pairs of rubber boots
2	1	pairs of Tyvek coveralls
1	1	dustpan
1	1	shop brush
12	6	heavy ply, polyethylene bags w/ties
1	1	first aid kit
80	10	lbs absorbent material
1	1	dozen blank labels
0	1	portable eyewash
1	0	synthetic fiber push broom
1	0	square-point "D" handle shovel

SCDNR Required Practices

Required practices, described below, are designed to ensure that the SCDNR's standards for use of herbicides meet or exceed the U.S. EPA's Worker Protection Standard for Agricultural Pesticides.

a. Prior to implementing use of any herbicide, the need for its use relative to management goals shall be described in the S.C. Aquatic Plant Management Plan, and/or in a Weed Plan specific to the site.
b. Only employees or contractors, who are certified/licensed by state and/or local regulations, are authorized to apply herbicides.
c. Application techniques, monitoring strategies, and impacts/progress toward goals and required reporting information shall be documented.
d. Standard safety practices for storage, mixing, transportation, disposal of containers and unused herbicide, and spill management will be followed.
e. Herbicide containers and related equipment will be stored in a secure containment area away from people, animals and food. Herbicide containers will be stored closed and inspected periodically. Hazardous waste will be labeled appropriately and include accumulation start dates.

f. Additional training required for the proper use and maintenance of personal protective equipment (PPE) and other equipment or required by the Occupational Safety and Health Administration (OSHA) shall be coordinated.
g. The point(s) of contact and threshold size for spills that must be reported shall be verified in advance with the appropriate local agency. This information and other emergency related information shall be provided to all applicators and initial responders through a written contingency plan.
h. Directions and contact numbers of the nearest emergency medical treatment facility will be provided to all applicators.
i. Investigations of herbicide related accidents and receipt of employee suggestions or complaints relating to safety and health issues involving herbicides will be used as a feedback mechanism that can be used to improve the program.
j. Decontamination kits must be readily available and must include two one-gallon (or more) containers filled with potable water, eyewash kits or eyewash bottles with buffered isotonic eyewash, hand or body soap, paper or other disposable towels, a full Tyvek coverall with foot covers, and a map and directions to the nearest medical facility. Whenever possible, those who apply herbicides shall have access (within 15 minutes travel time or at the nearest vehicle access point, whichever is closest) to an eyewash kit and either a 1) shower or large sink, or 2) emergency decontamination and first aid kits.
k. Treated areas should be closed to public access until they are judged safe for re-entry (or until the herbicide dries or for the minimum period required by the product label, whichever is longer). Posting is not required in most places, but where it is required (usually by local statute), place notices at points of entry or the perimeter of treated areas. Posting notices should include a statement that the area has been or will be treated, name of the herbicide, date of treatment, appropriate precautions to be taken or the date when re-entry is judged to be safe, and a phone number for additional information. Notices should be removed after it is judged safe to re-enter the area.
l. Under the NPDES Permit requirements, the SCDNR is required to maintain records for all herbicide application activities. These records shall include information on site(s), purpose(s), name(s) and amount(s) of product(s) used, name(s) of applicator(s), and licensing requirements for all herbicide applications in the previous 12 months. In addition, a yearly report shall include the same information, with estimates for the upcoming 12 months.

Adverse Incident Response

Any incident which results in adverse impacts to fish, wildlife, or non-target plant species will be reported to the appropriate contacts as listed in the Section 1 contacts table. Additionally, the causes of the adverse impact will be determined through a scientific assessment to prevent or mitigate future problems.

Pesticide Monitoring Requirements

a. While there are no specific pesticide residue monitoring requirements the SCDNR will maintain the following information along with any required monitoring data:

b. Records of equipment maintenance and calibration are to be maintained only by the entity performing the pest application activity (on behalf of self or client).
c. A copy of the NOI submitted to the Department and any correspondence exchanged between you and the Department specific to coverage under this permit;
d. The date on which you knew or reasonably should have known that you would exceed an annual treatment area threshold during any calendar year, as identified in Part 1.2.2;
e. Surveillance method(s) used, date(s) of surveillance activities, and findings of surveillance;
f. Target pest(s);
g. Pest density prior to pesticide application;
h. Company name and contact information for pesticide applicator;
i. Pesticide application date(s);
j. Description of treatment area, including location and size (acres or linear feet) of treatment area and identification of any waters, either by name or by location, to which you discharged any pesticide(s) (a GIS record of the specific area where discharge of herbicide occurs);
k. Name of each pesticide product used, including the EPA registration number;
l. Quantity of pesticide applied (and specify if quantities are for the pesticide product as packaged or as formulated and applied);
m. Concentration (%) of active ingredient in formulation;
n. For pesticide applications directly to waters, the effective concentration of active ingredient required for control;
o. Any unusual or unexpected effects identified to non-target organisms;
p. Documentation of any equipment cleaning, calibration, and repair (to be kept by pesticide application equipment operator); and
q. A copy of your PDMP, including any modifications made to the PDMP during the term of this permit.

General Specifications

a. The Contractor and SCDNR shall utilize equipment specifically designed for commercial application of herbicides. Equipment shall be kept in good operating condition at all times and must meet or exceed all safety requirements for this type of work. The equipment must be calibrated to disperse herbicides at the prescribed rate as outlined in the plan and records of said calibration shall be maintained. As a minimum requirement, the equipment shall meet the following conditions:
b. The Contractor shall have a minimum of two watercraft (airboats) and a skiff with a “mudmotor” capable of traveling through heavily vegetated waterways. The watercraft shall be equipped with depth finders capable of locating vegetation underwater, such as an Eagle Ultra or equivalent make and model. The Contractor shall also have a computerized herbicide delivery spray system which is calibrated and has Global Positioning System capability on each watercraft capable of recording exact positions of all treatments. Such unit shall be capable of creating a file, such as a shape file, which will be capable of being imported into a Geographic Information System program such as ESRI’s ArcView or any Arc Info based software and will provide SCDNR with a copy of such file in a timely manner. All data will become the property of SCDNR. The watercraft shall be capable of operation by one or two persons and shall be set up for un-

derwater injection, handgun application, or granular broadcast application. A helicopter contract or access must also be available to the Contractor for performing aerial application of herbicides as needed at specified sites when needed.

c. SCDNR reserves the right to inspect and approve all equipment to be utilized prior to the award. Non-conformance of equipment to SCDNR standards shall be reason for rejection of daily work.
d. Regulations and Standards:
e. The work shall comply with all laws, ordinances, and regulations of all legally constituted authorities that have jurisdiction over any part of this work. These requirements supplement these specifications and shall take precedence in case of conflict.
f. All work shall be performed and completed in a thoroughly workman like manner in accordance with best modern practices and any permit requirements, regardless of any omissions from the attached specifications and/or drawings.

Qualifications

a. The Contractor must have a minimum of five years of professional experience around chemical aquatic weed control on large public waterbodies.
b. All persons applying chemicals must be certified by the Clemson University Department of Pesticide Regulation in Category 5 (Aquatic Pest Control) or must work under the direct supervision of a person so tested and present on the spray boat.
c. All persons applying chemicals must be capable of identifying target plants in the field.
d. The Contractor must maintain liability insurance coverage of at least Five Million Dollars ($5,000,000) to fulfill requirements of PART II.A.12.

APPENDIX C

Enabling Legislation

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

Title 49 – Waters, Water Resources and Drainage

CHAPTER 6 AQUATIC PLANT MANAGEMENT

SECTION 49-6-10. 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:

1. 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.

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

3. 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 - Agriculture

Chapter 9 - State Crop Pest Commission

SECTION 46-9-10. Commission established; duties and responsibilities; membership of commission.

The State Crop Pest Commission is established. It shall execute this chapter, Section 46-1-140, Chapters 10, 13, 25, 26, 33, 35, and 37 of this title and other duties and responsibilities assigned by law. The commission consists of no less than three members of the Agriculture and Natural Resources Committee of the Clemson University Board of Trustees, or the committee's successor, as designated by the board.

SECTION 46-9-15. Definitions.

(5) "Plant pest" means a living stage of insects, mites, nematodes, slugs, animals, protozoa, snails or other invertebrate animals, bacteria, weeds, fungi, other parasite plants or their reproductive parts, or viruses, or organisms similar to or allied with the foregoing, including genetically engineered organisms or infectious substances which directly or indirectly may injure or cause disease or damage in plants or

their parts or processed, manufactured, or other products of plants, and which may be a serious agricultural threat to the State, as determined by the director.

SECTION 46-9-40. Authority to promulgate and enforce regulations; other powers of commission.

The commission, in accordance with the Administrative Procedures Act, may promulgate and enforce reasonable regulations as in the judgment of the commission may be necessary to eradicate or prevent the introduction, spread, or dissemination of plant pests, including genetically engineered plants or plant pest organisms, and prevent fraud or misrepresentation in the sale and dissemination of fruit trees, nut trees, shade and ornamental trees, vines, shrubs, plants, bulbs, and roots for propagation purposes. The commission may regulate or prohibit the shipment within, or the importation into, this State of plants, farm products, or other articles of any nature or character from a state, territory, or foreign country when, in the opinion of the commission, the regulation or prohibition is necessary to prevent the introduction or dissemination of plant pests.

The commission may carry out operations, including quarantines or measures to locate, suppress, control, or eradicate or to prevent or retard the spread of plant pests, independently or in cooperation with counties or their political subdivisions, municipalities, farmers' associations or similar organizations, individuals, federal agencies, or agencies of other states, by regulation, compliance agreement, judicial action, or other appropriate means.

Title 46, Chapter 23 - South Carolina Noxious Weed Act

SECTION 46-23-30. Commission may prevent introduction and dissemination of noxious weeds in State; remedies of owner of property destroyed or disposed of; regulations.

(a) The commission may, when it deems it necessary as an emergency measure in order to prevent the introduction into or the dissemination within South Carolina of any noxious weed new to or not theretofore widely prevalent or distributed within and throughout the State, 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. Provided, that no such noxious weed, product, article, or means of conveyance shall be destroyed, exported, or returned to the shipping point or so ordered to be destroyed, exported, or returned to the shipping point, unless in the opinion of the commission, there is no less drastic action which would be adequate to prevent the introduction or dissemination of noxious weeds.

SECTION 46-23-80. Penalty.

Any person who violates any provision of this chapter is guilty of a misdemeanor and, upon conviction, shall be punished by a fine not exceeding five hundred dollars, or by imprisonment not exceeding one year, or both.

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) A person may not 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 or eggs of the 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 erythrophtalmu*-Linneaus); and
(10) snakehead (all members of family Channidae).

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

(C) (1) The department may issue special permits for the stocking of sterile white amur or grass carp hybrids in the waters of this State. The special permits must certify that the permitee's white amur or grass carp hybrids have been tested and determined to be sterile. The department may charge a fee of one dollar for each white amur or grass carp hybrid that measures five inches or longer or twenty-five cents for each white amur or grass carp hybrid that measures less than five inches. The fee collected for sterility testing must be retained by the department and used to offset the costs of the testing.

(2) The department is authorized to promulgate regulations to establish a fee schedule to replace the fee schedule contained in item (1) of this subsection. Upon these regulations taking effect, the fee schedule contained in item (1) of this subsection no longer applies.

(D) The department may issue special permits for the importation, breeding, and possession of nonsterile white amur or grass carp hybrids. The permits must be issued pursuant to the requirements con-

tained in Chapter 18 of this title. Provided, however, that no white amur or grass carp hybrids imported, bred, or possessed pursuant to a special permit issued pursuant to this section may be stocked in the waters of this State except as provided in subsection (C) of this section.

(E) 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.

(F) 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.

South Carolina Code of Regulations

Chapter 27 Clemson University (Statutory Authority: 1976 Code §§ 46–9–40; 46–13–30; 46–13–55)

ARTICLE 10

DESIGNATION OF PLANT PESTS

27–135. Designation of Plant Pests.

1. The Commission hereby delegates to the Director the authority to determine and implement appropriate measures to eradicate, control, or slow the spread of plant pests in South Carolina. This authority extends to a decision that a plant pest has become so widespread that the initiation or continuation of control measures would be ineffective.

2. An advisory committee made up of at least 5 members will meet at least annually to review and make recommendations on the official listing of plant pests in SC. The committee members will be: The State Plant Regulatory Official for South Carolina (or designee), the USDA State Plant Health Director for South Carolina (or designee), a Clemson University Cooperative Extension Service Representative, and at least 2 at large representatives from other stakeholder agencies, such as the SC Department of Natural Resources, the SC Forestry Commission, or the SC Department of Agriculture. At large members shall be nominated and voted on by the advisory committee at its annual meeting. Additional at large members may be nominated and voted in at the annual advisory committee meeting. At large members from stakeholder agencies shall each serve a three-year term.

3. The official listing of plant pests in SC shall be maintained and made publicly available on Clemson's website located at: www.clemson.edu/invasives .

APPENDIX D

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: Aquatic Nuisance Species Program

S.C. Department of Natural Resources
2730 Fish Hatchery Road
West Columbia, South Carolina 29170
(803) 755-2836 email: invasiveweeds@dnr.sc.gov

** *Please include a sample of the plant, if possible, or a detailed digital image. Wrap the plant in a moist towel and place in a "baggie". The sample or photo should include flowers, if visible, along with leaf structure and stem*. A photo or drawing of the affected area with an approximate acreage should also accompany this form.

APPENDIX E

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

A. Diquat (Reward, Tribune, Solera)

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, Renovate Max G)

Target Plants

Emergent species - Broadleaf species such as water primrose, waterlily, spatterdock, 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.

C. Chelated Copper (Cutrine Plus, Clearigate, Komeen, K-TEA, Nautique, Captain, Natrix)

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 - (AquaStrike, Aquathol, Aquathol K, Aquathol Super K granular, Hydrothol 191granular 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 7gallons 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.

Aquastrike

Aquastrike costs approximately $73 per gallon.

Use Considerations - AquaStrike is a convenient combination of Aquathol K and Diquat. AquaStrike is designed and formulated for fast and effective control of many submersed nuisance and exotic aquatic plants, especially spike rush when used with a Flumioxazin product.

Water Use Restrictions – Do not use water treated with Aquastrike for irrigation to food crops or ornamentals for 7 days. Do not treat within 600 feet of a potable water intake. There are no fishing or swimming restrictions.

E. Glyphosate (Rodeo, Aquastar, Touchdown Pro, Glypro)

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. Flumioxazin (Clipper, Schooner)

Target Plants – Duckweed, water meal, water lettuce, frog's-bit, water fern, alligatorweed

Application Rate - Up to 12 ounces of formulated product per acre, on surface applications or 200 -400 ppb for subsurface treatment.

Cost - Flumioxazin products range in price from $120-140 per pound. At an application rate of 12 ounces per acre and an application cost of $41 per acre, the total would range from $131-$146 per acre per application.

Use Considerations - Flumioxazin is not toxic to mammals, birds or fish at recommended use concentrations. Flumioxazin 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 There are no restrictions on potable water use or recreation after treatment. Treated water may not be used for irrigation purposes on food crops until at least five (5) days after application. Do not use in water utilized for crawfish farming. Do not re-treat the same section of water with *Clipper* Herbicide more than 6 times per year. Do not exceed 400 ppb of *Clipper H*erbicide during any one application. On surface spray applications of less than 3 feet of depth there is a 12-hour restriction for irrigation of turf and landscape ornamentals and a restriction of subsurface treatment applications of 1 to 3 days depending on the concentration used. There is also a 5-day restriction for ornamentals grown for production in greenhouses and nurseries for both surface and subsurface application.

G. 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.

H. 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 ½ mile of potable water intakes. For applications within ½ 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. 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 ½ mile of potable water intakes. For applications within ½ 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.

J. 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.

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 fluridone (>21 days).

Water Use Restrictions - Food crop irrigation waters cannot be used if penoxsulam concentrations are above 1ppb

L. Florpyrauxifen-benzyl (ProcellaCOR-SC)

Target Plants

Submersed/emergent species – Hydrilla, Egeria, Watermilfoil, Eurasian watermilfoil, Lotus, Alligatorweed, Water primrose, Watershield, Crested floating heart, Parrotfeather, Water pennywort

Floating species – Floating species – Water hyacinth, Frog's bit, Mosquito fern

Submerged species - 1-5 PDU's per acre foot to achieve effective control based on density and species.

Floating species – 1-2 PDU's per acre as foliar application.

Cost –ProcellaCOR-SC costs approximately$3800 per gallon. The application rate is conveniently provided in PDU's directly from a built-in measurement device. 1 PDU equals approximately 1.35 ounces of product. Application rates for foliar are 1-2 PDU's per acre and for submersed from 1-5 PDU's per average acre foot. Assuming an application rate of 4 PDU per acre foot at a dept of 4 feet (4 PDU X 4 ac/ft=16 PDU's) and an application cost of $41 per acre, total cost would be $681 per acre for submersed plants. Assuming an application rate of 1 PDU acre, and an application cost of $41 per acre, total cost would be $81 per acre for emergent plants.

Use considerations – ProcellaCOR-SC has no potable water restrictions or irrigation restrictions except for irrigation of food crops and some landscape plants.

Water Use Restrictions - Food crop irrigation waters cannot be used if ProcellaCOR-SC concentrations are above 1 ppb

NOTE: This unique formula requires 40x-100x less active ingredient and achieves significantly longer control. With a *Reduced Risk* classification from the EPA, it is designed to reduce risk *To Our Health, Nontarget Plants, And Our Water Supply*

II. Biological Control

A. 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.

B. Alligatorweed Stem Borer Moth (*Vogtia malloi*)

Target Plant - Alligatorweed

Cost - Approximately the same as for flea beetle.

Use Considerations - Same as for flea beetle.

C. 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 SCDNR 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 SCDNR.

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 SCDHEC, and through the wastewater discharge permitting program (NPDES) also administered by the SCDHEC.

APPENDIX F

SCDNR and Santee Cooper
Aquatic Plant and Habitat Management Goals for the Santee Cooper Lakes

DRAFT- Currently under legal review by both agencies

MEMORANDUM OF AGREEMENT
BETWEEN SANTEE COOPER AND SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES
REGARDING AQUATIC PLANT AND HABITAT MANAGEMENT GOALS
FOR THE SANTEE COOPER LAKES

This AGREEMENT (hereinafter "Agreement") is between Santee Cooper (hereinafter "S-C") and the South Carolina Department of Natural Resources (hereinafter "DNR"). This Agreement is effective on the date of the last signatory to the Agreement.

WHEREAS, S-C and DNR recognize Lakes Marion and Moultrie (hereinafter "Lakes") as a significant natural resource of the State of South Carolina, and

WHEREAS, in order to provide balanced benefits to natural resources and the multiple uses of the Lakes, DNR and S-C (hereinafter "Parties") agree to cooperate in the management of aquatic vegetation and the habitat that it provides, and

WHEREAS, the Parties' goal is to maintain, at a minimum, 15% of the surface area of the waters within the Santee Cooper Project boundary as beneficial vegetated habitat for waterfowl, wildlife, fish and other aquatic organisms,

WHEREAS, the Parties agree that aquatic vegetation in the Lakes is, in many years and during certain cycles, driven by dynamic environmental forces that cannot be effectively controlled and

THEREFORE, in order to achieve this goal, the Parties agree to the following:

1) The aquatic plant management goal for the Lakes is to achieve a diverse assemblage of native aquatic vegetation in and on, at a minimum, 15% of the total surface area of the Lakes and to effectively control non-native invasive species. The aquatic plant coverage should include a combination of submersed, floating leaf, and emergent plant species, as well as diverse wetland habitat. These wetland habitats include Sparkleberry/Stumphole swamp and similar areas dominated by wetland tree and shrub species, such as Cypress, Tupelo, Black Willow and Buttonbush, as well as managed wetlands within SCDNR Wildlife Management Areas and US Fish & Wildlife Service Santee National Wildlife Refuge. The goal is to establish and maintain habitat and food for native fish and wildlife species throughout the lake system.

2) 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, in order to map 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 work plan for the following year.

3) The Parties will cooperate in monitoring the health of the fishery and in monitoring of wintering waterfowl populations. Wintering waterfowl population monitoring may consist of aerial or other

census techniques as deemed appropriate by the Parties. When waterfowl census is utilized, DNR will provide personnel and prepare an annual report to be distributed to both agencies, and S-C will provide the flight time.

4) Sterile grass carp will continue to be a major component of the long-term management strategy in controlling hydrilla (*Hydrilla verticillata*). The Parties 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 South Carolina Aquatic Plant management Council (hereinafter "Council"). The implementation of these recommendations will be subject to approval by the Council.

5) 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 or poses a threat to the Lakes.

6) Localized aquatic vegetation control using approved chemical or mechanical methods may be necessary in areas where vegetation interferes with power production, drinking water withdrawals, navigation, recreation or other legitimate uses of the Lakes regardless of plant coverage and distribution.

7) In order to enhance native plant growth and habitat throughout the lake system, the Parties will cooperate in implementing adaptive management techniques. These techniques could include such measures as, introducing desirable native plant species, enhancing wildlife/waterfowl management areas, and implementing strategic lake level management measures.

8) The Parties will meet annually to review the results of monitoring and treatment programs, to determine the effectiveness of the programs, and to develop annual work plans.

9) The Parties will meet annually 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.

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement as of the date hereof.
Santee Cooper
By:
Date:
South Carolina Department of Natural Resources
By:
Date:

- NOTE: This is a draft of the agreement which is currently being reviewed by SCDNR and Santee Cooper lawyers for revision..

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 2021 South Carolina Aquatic Plant Management Plan

Positive: 5
Negative: 112 (multiple messages from the same person were treated as one 'vote' against)
Neutral: 4

Comments:

From: Teresa MacGillivray <temacgillivray@gmail.com>
Subject: Cary Lake should be added
Date: Fri 1/22/2021 1:32 PM
Hi,

We just reviewed your list of proposed sites to receive assistance with nuisance aquatic plants. We have been living on Cary Lake for 20 years and the aquatic plants have been worse than ever since the 2015 flood. We live on the north cove which is just below Decker Blvd. and would really appreciate help in trying to get this under control.

Please feel free to contact us at any time. Thank you,

Teresa & Matt MacGillivray
6838 N Trenholm Rd.
Columbia, SC 29206
803-404-0010
803-348-0431

From: Tracy Roberts <troberts6583@yahoo.com>
Subject: Aquatic plants
Date: Fri 1/22/2021 2:16 PM
I believe that public awarenesses is key to handling invasive plants as the public can unknowingly proliferate the problem.

From: Dale Cozart <cozartd@gmail.com>
Subject: Aquatic Plant Management Plan Comments
Date: Wed 1/27/2021 8:18 AM
To whom it may concern: Once again, I have read your draft Aquatic Plant Management Plan and fully support your actions. I live on the shores of Lake Marion and am an avid boater and fisherman. Your efforts over the past few years have prevented the spread of nuisance plants in our lakes and river systems ensuring a safe and enjoyable body of water for everyone's use. Boaters, fishermen, hunters and water enthusiasts of all types benefit from your goals of controlling these invasive weeds. I know you spend an enormous amount of time preparing a plan to benefit everyone and I for one appreciate your in-depth research in this area and your team's hard work putting this plan into action. The old adage "you can't please everyone" applies, but the majority of property owners around the lakes surely benefit from your efforts in providing a clean waterfront, free of weeds and other invasive plants. As for fishermen and hunters, the fish were and always have been in the lakes, they just may be harder to locate without patches of weeds in which to hide. Likewise, the duck hunters have plenty of swamp and backwaters in which to ply their skills, no overgrowth of navigable waters is needed to attract birds. Keep up the good work.

Dale Cozart

From: Debra Gleaton <debgleaton@yahoo.com>
Subject: Invasive Plant Plan
Date: Mon 2/1/2021 3:58 PM
You guys do so much for the residence that live on the shores of Lake Marion and the folks that fish our lakes along with the recreational users. I support your plan!

From: Michael Avans <mavans2@ftc.net>
Subject: 2021 Aquatic Plant Management plan
Date: Mon 2/1/2021 7:14 PM
As a home owner on Lake Marion I wish to express my support for the 2021 Aquatic Plant Management Plan. Is there a way to get advance notice of when weed control spraying in Potato Creek will take place so I can improve SCDNR access to my shoreline by moving boats?

Michael Avans
1054 Autumn Ln
Summerton, SC. 29148

From: Eddie Gleaton <egleaton@yahoo.com>
Subject: 2021 DRAFT S.C. Aquatic Plant Management Plan
Date: Wed 2/3/2021 1:50 PM
I am writing to support the 2021 Draft S.C. Aquatic Plant Management Plan as presented.
I am a resident of Clarendon County and live on Lake Marion. I do not want to see our lakes faced with the problems of the past caused by invasive weeds.

Thank you in advance,

Eddie V. Gleaton, Jr.
1043 Autumn Lane
Summerton, SC 29148

803.478.6159

From: Adam Deal <adeal@greenwood52.org>
Subject: Aquatic Management Plan
Date: Fri 2/5/2021 12:55 PM
To whom it may concern,
This will be my first of many emails. This email is regarding lake Greenwood and the treatment of both slender naiad and val. I hope the committee will think twice of treating native species in the lake. What little is left on Lake Greenwood is needed as many plants and animals depend on such grasses for a healthy ecosystem as well as the benefits it provides to water quality and clarity. I would strongly urge the council to reconsider using grass carp in Lake Greenwood as the health of the overall carp population is indicated to be low as the fish appear small in size due to lack of food already. Overstocking and killing off native vegetation is a concern. I urge the council to use sound judgment and scientific reasoning as both indicate that saving these plants far outweigh any negative effects that these could have.
I have many other areas of the plan that show a lot of concern. The amount of grass on Greenwood is minimal at best and any should be treated with the utmost care transplanted to other areas of the lake vs being treated and killed.

I also urge the council to rethink listing hydrilla as a nuisance plant as the plant has been in SC and many parts of the south for many many many years. The plant itself if controlled to a certain level provides many benefits to an ecosystem and the benefits of this far outweigh any negative effects. I also suggest this as open space in an ecosystem will eventually be filled and it seems Giant Salvinia is filling that void once filled by Hydrilla.

--
Adam Deal ATC, SCATA
adeal@greenwood52.org
Cell- (864) 992-8594
640 South Cambridge Street
Ninety Six, SC 29666

From: Adam Deal <adeal@greenwood52.org>
Subject: Hydrilla
Date: Fri 2/5/2021 1:08 PM
Hydrilla has been around since before the 1960s in America. I believe and would like to see the eradication of this plant stop. I for one believe it is time to move this species to the native list and come to terms that it is here to stay. Over the past years in the name of eradication we have killed off many beneficial aquatic plants and continue to do so every year. Thus creating holes that things like Giant Salvain has begun to take over(which is much worse). The benefits of controlling hydrilla vs eradication is far greater than killing off the entire ecosystem.

--
Adam Deal ATC, SCATA
adeal@greenwood52.org
Cell- (864) 992-8594
640 South Cambridge Street
Ninety Six, SC 29666

From: Derrick Dimsdale <djdimsdale@gmail.com>
Subject: Stop destroying our state.
Date: Fri 2/5/2021 4:12 PM
To anyone involved in state managment plans and budgets,

Every single one of you should be ashamed. You clearly do not have the integrity to complete your jobs for the benifit of common South Carolina residents. Your focus all of your time and effort to please the wealthy all while completely ignoring the public land the rest of us have access to.

The states lakes are complete garbage and would be better off without you people. There is zero grass covere and little structure to support an actual fishing habitat and food chain.

Then come the waterfowl hunters you seam to despise with a passion. Again the lakes have absolutely zero food or cover for waterfowl so naturally they hold no waterfowl aside from resident geese on occasion. Then comes the cat 1 and 2 waterfowl managment areas where other than the SCR, you literally only have ONE managment technique. That one is banning hunters from using the areas unless its in the posted few hours you've chosen. Again there are no ducks in these areas because they have NO food to eat, the same as 98% of the states public lands.

Then comes the deer and turkey. On private land in SC, both can be plentiful. On public land however, one can spend an entire season searching through thousands of acres of useless pine trees and never find a single track.

Congratulations, you've wiped out most of the states useful hardwoods and released them with useless pine trees to protect a tree pecker that no one cares about. At the same time you've stocked carp and sprayed poisonous chemicals into the lakes at such a high rate, you've ruined them also.

Now on top of the money you've wasted to kill all the SAVs in the lakes, you have to waste even more to stock fish back into the waterways to please the fishermen.

You absolutely suck at everything except pleasing the wealthy. I will be spending my future in SC advocating to other outdoorsman and women to stop buying licenses in order to defund all of your jobs.

Sincerely,

Derrick Dimsdale.

From: Jimmy DiTraglia <jimmy.ditraglia@gmail.com>
Subject: Aquatic Management Plan
Date: Fri 2/5/2021 7:39 PM
I am writing to voice my opinion on the draft of your aquatic management plan and seemingly total lack of consideration of the comments of waterfowl hunters and anglers who see the benefit of SAV and native grasses. The PDF I was emailed recently is absolutely full of people asking you to halt stocking of grass carp, halt spraying chemicals, and consider other methods to remove invasive species that may actually cause issues rather than completely eradicating all of it as is especially the case in upstate lakes. Yet it is all continuing at a destructive pace.

To make things worse, I am seeing copper as a solution for some species of plants while noting that in the recommended amounts to use for the body of water that it could be toxic to fish. We feel that not allowing SAV to grow has already done enough damage to the fish population and do not want anything added that would kill more.

We feel that the threat of these plants is being exaggerated greatly and the state of South Carolina should let that ecosystem behave as it naturally would. I mean, look at how devastating all the SAV growing in Guntersville has been to their bass fishing and duck hunting. Right?

We are being told that it is necessary to kill all the SAV because it clogs the turbines on the dams and thus is an obstacle for hydroelectricity. Ok, why do other states manage to generate hydroelectricity just fine without poisoning the water? Look at all the TVA dams in Alabama, Tennessee, Kentucky, and a few other states. I used to live in middle Tennessee and our dams worked just fine. The reservoirs had plenty of native grasses. The public fishing and duck hunting there is far superior to that of South Carolina.

So, not to directly accuse anyone of lying, but I do have a very hard time believing that the clogging of the dams is the reason to kill all the SAV. Furthermore, I'm told by reputable sources that the only instances of this came after stocking grass carp because they caused huge mats to break off and float their way into turbines. Another great example of why to leave it alone and let the ecosystem do its thing.

Does Duke/Santee need to design a better solution? I don't mean that sarcastically, I'm serious. If TVA can do it, we should be able to as well. I am an electrical engineer and would be happy to devote some consulting time if I can be of assistance.

Please consider our opinions on the matter. I think you would be VERY hard pressed to find a state with worse public water duck hunting than South Carolina. That's not a sarcastic statement, that's serious. Things would be so much better if the SAV could grow as I'm told it used to be. There has to be a better solution than what the state has been doing. As stated above, I'm willing to lend my expertise if it can be used. Many of my friends here are willing as well.

--
Regards,
Jimmy DiTraglia

From: Trent Newton <trentnewton77@yahoo.com>
Subject: Aquatic Plant Management Plan
Date: Fri 2/5/2021 8:22 PM
To whom it may concern,

As a property owner and frequent user of Lake Greenwood I feel that the aquatic vegetation is managed very well. There is a great blend of vegetation present for wildlife but also water to use for recreation. I hope that the vegetation control remains the same or possibly increases with the Lauren's County water withdrawal plan.

Keep up the good work,
Trent Newton

From: Herb Strickland <herbware1946@yahoo.com>
Subject: I oppose the 2021 Aquatic Plant Management plan Draft
Date: Fri 2/5/2021 9:43 PM
I am against the future stocking of Grass Carp in our Lakes. This practice is causing a severe reduction in our fisheries and causing harm to other beneficial wildlife. Please quit or drastically reduce this practice until the situation is reversed.

From: Chase Todd <chasetodd444@gmail.com>
Subject: Opposition of Vegetation Control Plan
Date: Fri 2/5/2021 10:07 PM
I do hereby formally oppose the proposals to continue stocking hybrid grass carp into the Santee Cooper lake systems and others at the rates presented and the further introduction of carp into the lake systems throughout our state of South Carolina.

Michael Todd

From: Colby Sarvis <c.sarvis@yahoo.com>
Subject: I oppose the 2021 Aquatic Plant Management Plan Draft
Date: Fri 2/5/2021 11:11 PM
I do hereby formally oppose the proposals to continue stocking hybrid grass carp into the Santee Cooper lake systems and others at the rates presented and the further introduction of carp into the lake systems throughout our state of South Carolina.

At present, the effects of the carp stocking numbers have greatly altered the lakes as a whole habitat biome. Many species of fish and avian life that would normally thrive in such aquatic environments are neglected by such a plan.

The importance of a balanced wildlife ecosystem ranging from invertebrates to vertebrates is greatly ignored to detriment when there are actions in play that eradicate even the native submerged aquatic vegetation. These native aquatic plant species, and yes even some beneficial invasive species are the very building blocks of a healthy and functioning aquatic ecosystem.

As noted, these overly aggressive stocking actions not only cause great detriment to many species of wildlife and general water quality but also gravely effect the rural economies that center around hunting and fishing and other outdoor activities.

In a time of concern over water quality and South Carolina's ever decreasing wildlife habitat it's well past time that the APMC recognize these detrimental actions towards wildlife and water quality. Further, to continually ignore the amount of taxpaying citizens that have opposed such actions both past and present speaks negatively as an affront to the majority of recreational users and our hunting and fishing cultures.

We as sportsmen and women should be stewards of the land and water to give back far more than we take from them. Humans have a destructive way of harming nature and it’s natural balance. The natural vegetation that our lakes provide are what will keep our historical environment alive and well for many generations far into the future. It is vital that we take action to help protect the wildlife that call our great state home.

Colby Sarvis

From: Moe Dunn <moe.dunn79@gmail.com>
Subject: Invasive Weeds Action Proposal
Date: Sat 2/6/2021 12:30 AM
As 35 year resident of Lake Murray, in Lexington County SC., I have personally witnessed the original stocking of Asian Grass Carp into Lake Murray and the detrimental effects it has had on our Fishery and Wildlife System. Our Water and Eco Systems are extremely fragile and continued stocking of these Non-Native Fish is continually changing our Natural Resources at alarming rates, that take many years to re-build.

I do hereby formally oppose the proposals to continue stocking hybrid grass carp into the Santee Cooper lake systems and others at the rates presented and the further introduction of carp into the lake systems throughout our state of South Carolina.

At present, the effects of the carp stocking numbers have greatly altered the lakes as a whole habitat biome. Many species of fish and avian life that would normally thrive in such aquatic environments are neglected by such a plan.

The importance of a balanced wildlife ecosystem ranging from invertebrates to vertebrates is greatly ignored, to detriment, when there are actions in play designed to eradicate even the native submerged aquatic vegetation. These native aquatic plant species, and yes, even some beneficial invasive species are the very building blocks of a healthy and functioning aquatic ecosystem.

As noted, these overly aggressive stocking actions not only cause detriment to many species of wildlife but also negatively effect the rural economies that center around hunting and fishing and other outdoor activities.

In a time of concern over water quality and South Carolina's ever decreasing wildlife habitat it's well past time that the APMC recognize these detrimental actions towards wildlife and water quality. Further, to continually ignore the amount of taxpaying citizens that have opposed such actions, both past and present, speaks negatively as an affront to the majority of recreational users and our hunting and fishing cultures.

With Kind Regards,

Moe Dunn
803-513-0200

From: harleston towles <harlestontowles3@gmail.com>
Subject: Less carp, more grass please...
Date: Sat 2/6/2021 1:40 AM
To whom it may concern:

Habitat for wading birds, waterfowl, and game fishes will continue to be severely lacking if the stocking of carp at proposed levels should remain.

Numbers for the aforementioned wading birds, waterfowl, and game fishes are all at such poor levels in South Carolina that carp would be like driving a nail in the coffin for hunting, fishing, and bird watching in and around the State.

Please consider allowing natural vegetation to reestablish itself on the lakes in order to bring wildlife back to stable numbers. The situation is nearly dire at the moment, and we can’t afford to lose the rich heritage and cultural significance that comes with holding wild game on these bodies of water. Thank you in advance for your consideration in the matter.

Harleston Towles
843.557.5765

From: Logan Barnes <barnesld@gmail.com>
Subject: Aquatic Management Plan
Date: Sat 2/6/2021 5:01 AM
To whom it may concern,

I do hereby formally oppose the proposals to continue stocking hybrid grass carp into the Santee Cooper lake systems and others at the rates presented and the further introduction of carp into the lake systems throughout our state of South Carolina.

At present, the effects of the carp stocking numbers have greatly altered the lakes as a whole habitat biome. Many species of fish and avian life that would normally thrive in such aquatic environments are neglected by such a plan.

The importance of a balanced wildlife ecosystem ranging from invertebrates to vertebrates is greatly ignored, to detriment, when there are actions in play designed to eradicate even the native submerged aquatic vegetation. These native aquatic plant species, and yes, even some beneficial invasive species

are the very building blocks of a healthy and functioning aquatic ecosystem.

As noted, these overly aggressive stocking actions not only cause detriment to many species of wildlife but also negatively effect the rural economies that center around hunting and fishing and other outdoor activities.

In a time of concern over water quality and South Carolina's ever decreasing wildlife habitat it's well past time that the APMC recognize these detrimental actions towards wildlife and water quality. Further, to continually ignore the amount of taxpaying citizens that have opposed such actions, both past and present, speaks negatively as an affront to the majority of recreational users and our hunting and fishing cultures.

I grew up fishing Lake Marion in the grass. It's a sad sight today to compare the lack of wildlife today to the early 90s.

Sincerely,

Logan Barnes, DMD

From: Carl G <cgulledge@sc.rr.com>
Subject:
Date: Sat 2/6/2021 6:13 AM
I do hereby formally oppose the proposals to continue stocking hybrid grass carp into the Santee Cooper lake systems and others at the rates presented and the further introduction of carp into the lake systems throughout our state of South Carolina.

At present, the effects of the carp stocking numbers have greatly altered the lakes as a whole habitat biome. Many species of fish and avian life that would normally thrive in such aquatic environments are neglected by such a plan.

The importance of a balanced wildlife ecosystem ranging from invertebrates to vertebrates is greatly ignored, to detriment, when there are actions in play designed to eradicate even the native submerged aquatic vegetation. These native aquatic plant species, and yes, even some beneficial invasive species are the very building blocks of a healthy and functioning aquatic ecosystem.

As noted, these overly aggressive stocking actions not only cause detriment to many species of wildlife but also negatively effect the rural economies that center around hunting and fishing and other outdoor activities.

In a time of concern over water quality and South Carolina's ever decreasing wildlife habitat it's well past time that the APMC recognize these detrimental actions towards wildlife and water quality. Further, to continually ignore the amount of taxpaying citizens that have opposed such actions, both past and present, speaks negatively as an affront to the majority of recreational users and our hunting and fishing cultures.

Please stop RUINING our lakes so that people do not have to TOUCH weeds/grass.

Carl Gulledge, Jr.

From: Joshua Townsend <zinkph1@gmail.com>
Subject: I oppose the 2021 aquatic plant management draft

Date: Sat 2/6/2021 7:05 AM
Please no more carp. Our fisheries and waterfowl are at an all time low. They're are other lakes in bordering states that are hydro powered lakes with vegetation a plenty and the fisheries and waterfowl and economy's around the lake are thriving.

From: Robert Huggins <huggs121566@yahoo.com>
Subject: Invasive weeds legislation
Date: Sat 2/6/2021 8:01 AM
I am sending this email to voice my opposition to the proposed invasive weeds legislation for 2021. I am a lifelong resident of South Carolina and avid outdoorsman. Please do not implement this legislation.
Cordially.....
Robert Huggins
Murrells Inlet, SC

From: Jackson Sims <1coastalrunner@gmail.com>
Subject: Re: I oppose the 2021 draft weed control measures
Date: Sat 2/6/2021 9:40 AM
Leave the weeds alone..They are beneficial for wildlife fish and ducks.Stop putting grass carp into the lakes and dumping cancer causing chemicals into our lakes.We can use this money on other things.Jackson Sims...610 n.congdon street Georgetown S.C.29440...

From: Blake Harrell <bharrell1340@gmail.com>
Subject: 2021 APMP
Date: Sat 2/6/2021 10:25 AM
Good Morning,

I wanted to send an email to offer a few comments regarding the 2021 APMP. I know there are a great deal of emails being sent that are basically copied and pasted blasting the council, DNR, etc. for invasive aquatic management, however this email will not parallel that sentiment.

I would like to premise the following with the fact that the most important area to me is Lake Marion, and it's upper flood plain. I am an avid waterfowl hunter, and for obvious reasons this lake is important to me, and many other recreational hunters. Also, the areas that I am familiar with are those north of I-95 because of this reason, so the following will be speaking with respect to that particular body of water. Lastly, I would also like to make it known that I have been very involved with the SCWA on multiple levels over the past 6-7 years, and am very aware of the other effects that flooded ag impoundments along the north eastern side of the lake have on waterfowl distribution.

With that said, the two species that stand out the most to me from this plan are hyacinth and salvinia. Particularly along the eastern back waters of the lake, north of 95, these two types of vegetation have everything locked up; not only from boat access, but from any open water as far as I can tell, In particularly the shallower areas that could be accessible by boat in the hickory top WMA. I do support the management of these species to a significant extent because of the lack of accessibility and detrimental habitat effects that result. I know, at least hyacinth, grows at an alarming rate, however is it this plan's goal (if even achievable) to completely eradicate the vegetation, or reduce numbers to a percentage (70%-80%)? I think a certain amount can certainly be beneficial to waterfowl populations, if managed properly (again, if feasible). Also, I notice that the species specifically targeted under "Hickory Top WMA" do not include hyacinth, or salvinia; is this area only referring to the impounded green tree resivoir?

Additionally, I see where water primrose is listed as one of the plant species to be managed in 2021, and I am aware of some stands of this currently, however I have never come across a area where I would have considered it to be an issue. I ask this again because of the nutritional benefit of primrose to waterfowl populations.

Additionally, I have have misread somewhere, but basically the annual monetary cap for these management plans is $30,000 per area, however specifically the Lake Marion plan totals in $600,000. Does this essentially mean that nothing significant will be done, or the funding will be provided by other sources than state/federal (Santee Cooper)?

In regards to hydrilla and the grass carp, I personally have never noticed any issues that have been caused by SAVs like hydrilla, from a recreational standpoint. I know it can be a viable nutrient sources for many pochards and other waterfowl, however is the management provided by the grass carp eliminating the hydrilla completely (to the extent where the current hydrilla density can only sustain these carp) or is there a "surplus" that is still available to sustain other wild life populations? I understand without the carp there would be an excessive surplus of hydrilla, but I see so many comments regarding the matter it is difficult to distinguish fact from hearsay.

In conclusion, I believe the management of this vegetation is important and reasonable to certain extents in areas where needed. I know there is a lot of opposition to this management, and would recommend and request (for my own edification as well) more publicly accessible/regularly published information regarding the matter (where, when, why, etc.). I am not speaking necessarily to huge publications, but for example, a short article regarding the benefits and detriments of water hyacinth in its current distribution in and around the northern portions of Lake Marion. I believe many individuals would benefit from this information being broken down like this into specific areas to see exactly why this type of management is necessary.

Thank you very much for your time, and I look forward to hearing from you soon. Have a great weekend.

Blake Harrell

From: Britt Oswald <brittoswald78@gmail.com>
Subject: I oppose the 2021 Aquatic Plant Management Plan Draft
Date: Sat 2/6/2021 10:25 AM
I do hereby formally oppose the proposals to continue stocking hybrid grass carp into the Santee Cooper lake systems and others at the rates presented and the further introduction of carp into the lake systems throughout our state of South Carolina.

Britt Oswald
Sales Associate
Faulkner/Haynes & Associates
OFFICE. 864-329-0372
MOBILE. 864-525-8785
FAX. 864-329-0376

From: Stephen Thomas <srthomas@comporium.net>
Subject: Comments on the APMC Plan - no more grass carp in the Santee Cooper system.
Date: Sat 2/6/2021 11:14 AM
Prior to 1995 or so the Santee Cooper system, Lakes Marion and Moultrie, was a healthy, thriving ecosystem that was covered with terrestrial life and inundated with aquatic diversity. Small and relatively

unknown species like blackbanded sunfish, flier, and bluefin killifish were so abundant that they could be caught, literally by the dozens, simply by dipping a 5-gallon bucket into the then plentiful submerged aquatic vegetation (SAV) and letting water and life rush in. Of course, with the foundation of the ecological pyramid so firmly in place, populations of higher order and more economically important species flourished too.

Striper fishing was phenomenal. Largemouth bass and catfish were abundant. There were enough bream and crappie that anyone who ventured out in the spring with a bucket of minnows or a tube of crickets was treated to the Lowcountry's best. This healthy ecosystem extended out of the lakes, into the air, and onto the riparian surroundings. Birds, especially migratory species in the fall and winter, flocked to our systems of lakes. The open areas provided safety for their numbers while the compatible biomass sustained their physical needs. Birds that would otherwise have to extend their migrations much further south found a pleasant winter home in South Carolina. They returned north in greater numbers and in better health because of the abundance of the famed Santee Cooper system. Santee Cooper became a self-fulfilling prophecy as these healthy and numerous species along with their progeny returned the following autumn in even greater numbers. There was no doubt – The Santee Cooper system's fame was well deserved and well earned.

Then came the idea of grass carp. The awkward and bumbling early use of hundreds of thousands of grass carp destroyed the bio-diversity of the lakes. Sport fish died off and, because of the sterile condition on the lakes, couldn't reproduce themselves. Migratory birds were forced to continue further south exposing themselves to greater predation during longer and more physically-depleting migrations. The over use of this one method of control has replaced what was once the most common denizens of the lake, fish and birds, with pontoon boats freely piloted over what is a literal aquatic desert. Trading a healthy ecosystem for easier navigation was not worth the cost - not even close.

I don't fault anyone for these early attempts, however. We were dealing with something so unknown and alien that there were bound to be some mistakes. I do fault the decision makers for the continued decades of unrelenting use of grass carp to fight a problem that hasn't existed for 20 years. The cliché about doing the same thing and expecting different result is so apposite that it is madding to those of us who have patiently waited for these few decision makers to finally come to terms with the damage and reverse course. The damaged caused in the mean time, may be irreparable.

The absence of SAVs and the over application of grass carp have made Santee Cooper the perfect environment for invasive species that aren't on the grass carp's menu like crested floating heart and water hyacinth. White marsh has taken over shallower areas and turned fertile, useful lake into impenetrable marsh that even rails won't use. Open flats that used to be covered with SAVs and filled with invertebrates and now barren flats with unfolding cypress trees that are already starting to block enough sun that SAVs may never grow again. We won't easily reclaim these areas but we can limit any further damage.

There is only one sane decision that can be made at this point: stop using grass carp anywhere on the Santee Cooper system – period and forever. I do not and will never again support the use of grass carp on the Santee Cooper System.

Stephen R. Thomas
545 Whitehead Court
Fort Mill, SC 29708

803-372-8729

From: Clark McCrary <cmccrary@netsourcek12.com>
Subject: Draft Plan
Date: Sat 2/6/2021 11:18 AM
I strongly oppose the use of grass carp in any lake in South Carolina. The APMC knows full and well their destruction to all submersed vegetation.

From: Brandon Wagner <wagnerb26@gmail.com>
Subject: 2021 APMP
Date: Sat 2/6/2021 10:25 AM
I oppose the 2021 Aquatic Plant Management Plan Draft due to the stocking of grass carp. These carp cannot distinguish between beneficial aquatic plants and nuisance plants. I only approve of selective spraying. I also disagree with the target goal of aquatic plant percentage covers.The percentage goals are much too small to benefit wildlife.

The only benefactor of stocking carp is the growing populations of Cormorants as this makes finding their meals much easier.

From: Bradham <cmbradham@gmail.com>
Subject: 2021 Aquatic Plant Management Plan
Date: Sat 2/6/2021 11:38 AM
I strongly oppose the use of grass carp in the Santee Cooper lakes system.

From: Brian Martin <btm1971.bm@gmail.com>
Subject: I oppose the 2021 Aquatic Plant Management Plan Draft
Date: Sat 2/6/2021 11:51 AM
To who it may concern,

I do hereby formally oppose the proposals to continue stocking hybrid grass carp into the Santee Cooper lake systems and others at the rates presented and the further introduction of carp into the lake systems throughout our state of South Carolina.

At present, the effects of the carp stocking numbers have greatly altered the lakes as a whole habitat biome. Many species of fish and avian life that would normally thrive in such aquatic environments are neglected by such a plan.

The importance of a balanced wildlife ecosystem ranging from invertebrates to vertebrates is greatly ignored to detriment when there are actions in play that eradicate even the native submerged aquatic vegetation. These native aquatic plant species, and yes even some beneficial invasive species are the very building blocks of a healthy and functioning aquatic ecosystem.

As noted, these overly aggressive stocking actions not only cause great detriment to many species of wildlife and general water quality but also gravely effect the rural economies that center around hunting and fishing and other outdoor activities.

In a time of concern over water quality and South Carolina's ever decreasing wildlife habitat it's well past time that the APMC recognize these detrimental actions towards wildlife and water quality. Further, to continually ignore the amount of taxpaying citizens that have opposed such actions both past and present speaks negatively as an affront to the majority of recreational users and our hunting and fishing cultures.

I've lived here all my life, 50 years. I've hunted and fished our Santee Cooper lakes my entire life. My grandparents owned a home on lake Marion. At one time the waterfowling on lakes Marion and Moultrie were exceptional! Then the introduction of carp and spraying EVERYTHING, ruined our lakes. The hydrilla and most other SAV's are gone, along with the ducks. As I get older I pray that one day. People will see and experience what I did on our lakes. All us old guys have now are stories of good times. Please help us and our lakes become great again.

Sincerely,
Brian Martin

From: Scott Wilson <scottwilson12322@yahoo.com>
Subject: Scott Wilson <scottwilson12322@yahoo.com>
Date: Sat 2/6/2021 12:33 PM
I do hereby formally oppose the proposals to continue stocking hybrid grass carp into the Santee Cooper lake systems and others at the rates presented and the further introduction of carp into the lake systems throughout our state of South Carolina.

From: Justin Ariail <justinariail1@gmail.com>
Subject: Grass carp
Date: Sat 2/6/2021 12:49 PM
Grass carp are contributing to the problem more than they are helping in Santee. I do NOT support anymore grass carp in the Santee Cooper System!

From: Jess Williams <norwil@ftc-i.net>
Subject: 2021 aquatic weed mgmt plan
Date: Sat 2/6/2021 1:10 PM
I read over the 2021 plan for Santee Cooper lakes, Marion and moultrie. I am adamantly opposed to the release of grass carp, ever again in this lake.
The destruction that has been caused over the past 25 years with grass carp, from which it may never recover.

Please focus on the crested heart and water hyacinth that has been allowed to proliferate due to the lack of native vegetation.
Jess Williams
8034915732

From: Houston Taylor <houstontaylor95@gmail.com>
Subject: Aquatic plant management
Date: Sat 2/6/2021 2:04 PM
I oppose the 2021 aquatic plant management plan draft the continuous introduction of grass carp to the lakes are taking food for all aquatic wildlife because there is no management plan in place for them and they become over populated

From: Christopher Hannah <channah85@gmail.com>
Subject: DNR Aquatic Management Concerns
Date: Sat 2/6/2021 3:18 PM
The introduction of grass carp on the Santee Lake and River systems has wrecked havoc on what used to be a thriving, diverse ecosystem. I need not explain how and why, as your organization, the South Carolina Dept. of Natural Resources, already knows how and why grass carp have had a negative impact our native vegetation and wildlife.

I am an outdoorsman. My interests revolve around hunting, fishing, and hiking. As I have already stated, the introduction of grass carp has negatively impacted a variety of our states native habitat and wildlife, however the most noticeable impact has been the gross disappearance of migratory waterfowl during the winter months on our river and lakes. Grass carp have decimated the food source that waterfowl need to STAY in our state. I have witnessed on many occasions, large numbers of migrating waterfowl appear and leave within 24 hrs, due to lack of food on the lakes and rivers, that used to hold and sustain waterfowl before the introduction of grass carp.

This begs to have the question answered... What does DNR wish to protect? The interests of private companies? Or the interests of our natural resources and outdoorsmen? If DNR wishes to continue to bring in the revenue generated from hunting and fishing licenses from South Carolinians, I sure hope to see a change in priorities and manage the resources for the benefit of wildlife, and the people who use our natural resources. We love many things about the state of South Carolina, however, the reduction in quality outdoor hunting and fishing opportunities due to mismanagement of the natural resources at the interest of privatized organizations, has our family considering moving elsewhere.

Again, I ask, where do SCDNR's priorities lay?

From: Wayne Plyler <wayneplyler@icloud.com>
Subject: Carp
Date: Sun 2/7/2021 8:34 AM
No carp please

From: Bunn Tyson <btyson3@sc.rr.com>
Subject: Aquatic Management Plan
Date: Sun 2/7/2021 10:25 AM
All efforts should be directed at spraying the Giant Salvania, along with lower winter levels to help.

Adding more carp to the system isn't the answer.

Do they even eat Salvania?

Sincerely,
Bunn Tyson

From: Blake Elliott <blake_elliott7@icloud.com>
Subject: DNR Aquatic Management Plan
Date: Sun 2/7/2021 3:36 PM
Concerning aquatic management on SC waterways. You messed up. You took thousands of acres of pristine wildlife habitat and turned it into barren deserts of water, only to suffice recreational boaters. This, along with our state's joke of a deer management program, has made this state an outcast in terms of wildlife resource management compared to so many other success stories in other states. You messed up. You're still messing up. There is time to fix it. Please, fix it. Thank you for your time.

Blake Elliott

From: David Christian <dcmbsc24@gmail.com>
Subject: Information email about carp.
Date: Sun 2/7/2021 5:14 PM
I oppose anymore carp in our bodies of water, ie: santee lakes. Thank you David christian

From: Paul Taylor <paultaylorrealtor@gmail.com>
Subject: 2021 Aquatic Management Plan Input
Date: Sun 2/7/2021 8:44 PM
Hello Chris!

I hope you are doing well!

I want to voice my opposition for stocking grass carp in SC lakes. We desperately need vegetation in our lakes. Grass carp don't discriminate when it comes to what they eat, sure they might prefer hydrilla but once it's gone they essentially eat everything, invasive and native. My latest observation has been the decline of Vallisneria beds on Lake Murray. I know Vallisneria is low on the preferred food for grass carp but I'm afraid they have predated it here on Lake Murray. The beds of grass looked horrible this past Fall and the lake bottom was barren where we once had flourishing beds of grass. Or has Dominion or DNR applied a herbicide to it? I was sick when I saw it.

We need SAV in our waterways, I am witnessing seemingly unfettered development all around Lake Murray. As you know, this development is creating nonsource point pollutants and SAV helps filter these pollutants. Folks on Lake Murray need to be educated about the benefits of SAV, reduce shoreline erosion benefits for fish, waterfowl and wildlife, water quality and clarity....rather than seeking to eradicate SAV.

Thank you!
Paul

From: Clark Truluck <mctruluck@gmail.com>
Subject: I I oppose the 2021 Aquatic Plant Management Plan Draft
Date: Mon 2/8/2021 9:51 AM
(No text in body of email.)

From: Bruce Bonge <bbonge@hotmail.com>
Subject: Opposition to the 2021 Aquatic Plant Management Plan Draft
Date: Mon 2/8/2021 10:16 AM
I formally oppose the proposal to continue stocking hybrid grass carp into the Santee Cooper lake systems and other bodies of water at the rates presented. A balance must be found, as the current overly aggressive stocking scheme has rendered these lakes a barren desert, removing even native vegetation that fish and waterfowl depend on.

B.K. Bonge Jr.
N. Charleston, SC

From: R Patten Watson <duck.tail@yahoo.com>
Subject: invasive weed control
Date: Mon 2/8/2021 10:53 AM
My experience is at Lakes Marion and Monticello.

I have never had a serious issues with weeds at Monticello. Perhaps they have been kept in control at that lake all along but I would also thing the continuous fluctuations of the lake levels has a lot to do with it also.

In Marion, I know about the old weed problems but that came with fishing and hunting. The weeds were there as were the fish and ducks. The lake now seems sterile. Maybe an occasional lost duck is seen. The fishing is nothing like it used to be.

There is obviously argument for the weed control but not total destruction of the habitat which is what it seems to be going to. I am aware that some areas still hold weeds but it does not seem to be enough for necessary food and habitat.

Richard P Watson III

From: John Marscher <john.marscher@gmail.com>
Subject: I Oppose the 2021 Aquatic Plant Management Plan
Date: Mon 2/8/2021 11:13 AM
I oppose the stocking of grass carp into the Santee Cooper lake system. These overly aggressive stocking actions are detrimental to many species of wildlife, as well as negatively affecting the communities surrounding the lake that depend on a healthy aquatic ecosystem.

Thank you,

John Marscher

From: Adam Deal <adeal@greenwood52.org>
Subject: 2021 Draft
Date: Tue 2/9/2021 8:44 AM
I am emailing the council in regards to the 2021 draft. I would like to urge the council to reconsider placing native vegetation on the list of nuisance plants. I fish,hunt, and joy ride on many lakes in South Carolina and enjoy open water as much as the next guy. I believe a balance between vegetation and a healthy ecosystem is vital and the eradication of beneficial plants has occurred at the pressure of legislature and homeowners. I lived on Lake Greenwood for almost 10 years and even the small amount of vegetation left should be protected. The Southern Naiad and Val should be left alone and not treated as these grasses benefits far outweigh any negative effects. I have been in and out of almost every cove in Greenwood and have never had an issue with grass and those claiming to have any are being misleading. I urge the council to remove any native vegetation from the nuisance list from any lake as well rethink the carp stocking to allow native vegetations to fill holes that over treating has created in the past. Now would be a good time to replace native vegetation in many lakes with planting programs. I for one would love to volunteer for such a program. Thanks for your time!

--
Adam Deal ATC, SCATA
adeal@greenwood52.org
Cell- (864) 992-8594
640 South Cambridge Street
Ninety Six, SC 29666

From: M Green <jmgreen4@live.com> >
Subject: No more grass carp please.
Date: Tue 2/9/2021 4:46 PM
Once again this year I am writing to oppose the release of additional grass carp into lakes in SC.

Since the introduction of grass carp into our lakes fishing, hunting, and general lake enjoyment for me has decreased greatly.

Areas where there used to be nice grass beds are now mud or sand.. The lake bottom is barren with the only vegetation present being invasive species grass carp will not eat.

Areas that do not support waterskiing, jet skis, and other pleasure boat traffic should be allowed to grow native SAV.

Removing native and other beneficial vegetation has allowed floated crested heart, giant Salvinia, hyacinths and other invasive carp do not eat to take over large areas of Santee lakes and other lakes will not be far behind.

Please reduce amount of carp stocked into our lakes in this and future years to a level that allows areas of natural SAV to live.

I support control of hyacinths, crested floating heart, giant Salvinia, saw grass, and other recent invasives.

I am opposed to control of native SAV, elodea, eelgrass, and hydrilla.

Not a scientist, but I know how much more enjoyable the lakes were before introduction of grass carp and strongly oppose their continued introduction into our lakes in SC.

James Green
Orangeburg SC

From: Adam Deal <adeal@greenwood52.org>
Subject: Draft 21
Date: Wed 2/10/2021 11:12 AM
To whom it may concern,

I am emailing in regards to the current 21 aquatic management draft. I would like to urge the council to reconsider using grass carp as a way of controlling aquatic vegetation as health indices indicate that overstocking is occurring on many bodies of water in SC. I understand the need but I also understand a balance between SAv's and a healthy ecosystem is virtually important for our fisheries as well as many migrating birds that use SC as a winter home. As I am sure many at DNR understand as home ownership rises around lakes and rivers the pressure to treat these grasses has increased as well. I urge to use sound science to teach and educate those that would see these lakes turned into swimming pools. I also am opposed to any stocking of grass carp into any Cat 1 or Cat 2 waterfowl areas or areas that may feed into these places. It is important again to maintain a balance and as overstocking continues native vegetation suffers. I would also like any native species of grass to be removed from any nuisance list and physical removal vs treatment with chemicals. Opening of areas of travel can be achieved through many different means and physical removal vs harmful chemicals seems to be a much better option. I would even volunteer to assist in the physical removal of unwanted vegetation in areas needing to be opened vs treating with chemicals. The removal of the unwanted vegetation could also be used to feed or fertilize fields, Thanks!

--
Adam Deal ATC, SCATA
adeal@greenwood52.org
Cell- (864) 992-8594
640 South Cambridge Street

Ninety Six, SC 29666

From: Jason and Kristin Black <jkcblack@gmail.com>
Subject: Thoughts and Consideration
Date: Wed 2/10/2021 9:12 PM
I strongly oppose the proposals to continue stocking hybrid grass carp into the Santee Cooper lake systems and other bodies of water at the rates presented and the further introduction of carp into the lake systems throughout our state of South Carolina.

At present, the effects of the carp stocking numbers have greatly altered the lakes as a whole habitat biome. Many species of fish and avian life that would normally thrive in such aquatic environments are neglected by such a plan.

The importance of a BALANCED wildlife ecosystem ranging from invertebrates to vertebrates is greatly ignored to detriment when there are actions in play that eradicate even the native submerged aquatic vegetation. These native aquatic plant species, and yes even some beneficial invasive species are the very building blocks of a healthy and functioning aquatic ecosystem. Tennessee and Alabama are two close states that have a variety of beneficial SAVs on bodies of water that are used to generate power. The fishing and hunting industry in these areas are thriving and having a substantial impact on the respective economies in these areas.

As noted, these overly aggressive stocking actions not only cause great detriment to many species of wildlife and general water quality but also have a tremendous effect on the rural economies that center around hunting and fishing and other outdoor activities.

In a time of concern over water quality and South Carolina's ever decreasing wildlife habitat it's well past time that the APMC recognize these detrimental actions towards wildlife and water quality. Further, to continually ignore the amount of taxpaying citizens that have opposed such actions both past and present speaks negatively as an affront to the majority of recreational users and our hunting and fishing cultures.

Thanks,

Jason Black

From: Sean Ravenscroft <seanravenscroft082@gmail.com>
Subject: Aquatic vegetation.
Date: Wed 2/17/2021 1:20 PM
I am most definitely on board with having aquatic life in SC WATERS. Gator grass,eel miles etc. Clark's Hill is in dire need of this. Taking grass out of the lake is lime taking a grocery store from humans.

From: Griffin Conner <cff.griffin20@gmail.com>
Subject: Invasive Weed Comments
Date: Wed 2/17/2021 1:20 PM
Good morning,

Everybody has their comments on the invasive aquatic vegetation that can be found on SC lakes, but as an avid outdoorsman I do have mine for what they are worth. As a duck hunter of SC, I believe the SC DNR killing off the subaquatic vegetation has slowly and steadily decreased our success as a whole state. The few birds that we do get to migrate to our state, have absolutely no reason to be here when all the "food" that they would eat, has been killed off. That is why duck hunting even 10 years ago was loads

better than it is now. Especially for us upstate hunters, we don't have big money impoundments around our lakes to hold birds, what holds our birds is what y'all kill every year. Also, fishing on our lakes would be better, not that I complain, but the aquatic vegetation is not only substantial habitat for fish, but also adds nutrients to the water to grow healthier fish. Clark's Hill is a prime example of this. The summer time hydrilla used to be an excellent way to catch fish offshore, and good fish! Now you cannot even have this option, and neither do the fish for their summertime movements. I do hope that other outdoorsmen have voiced their opinions and I hope that y'all thoroughly think about the effects that the invasive weed plan has on our state outdoorsmen.

Thank you for your time,

Griffin Conner

The following text was received from 74 people. The list of senders is below the text. Anyone who forwarded the "Call to Action Alert" from Carolina Wildlife Syndicate in its entirety, but did not add any text is included in this list. Anyone who added to this text is listed separately above. The dates of receipt were from 2/5/2021 thru 2/14/2021.
I <name>, do hereby formally oppose the proposals to continue stocking hybrid grass carp into the Santee Cooper lake systems and others at the rates presented.

At present, the effects of the carp stocking numbers have greatly altered the lakes as a whole habitat biome. Many species of fish and avian life that would normally thrive in such aquatic environments are neglected by such a plan.

The importance of a balanced wildlife ecosystem ranging from invertebrates to vertebrates is greatly ignored to detriment when there are actions in play that eradicate even the native submerged aquatic vegetation. These native aquatic plant species, and yes even some beneficial invasives are the very building blocks of a healthy and functioning aquatic ecosystem.

As noted, these overly aggressive stocking actions not only cause detriment to many species of wildlife but also negatively effect (or affect) the economies that center around hunting and fishing and other outdoor activities.

In a time of concern over water quality and South Carolina's ever decreasing wildlife habitat it's well past time that the APMC recognize these detrimental actions towards wildlife and water quality. Further, to continually ignore the amount of taxpaying citizens that have opposed such actions both past and present speaks negatively to the majority of recreational users and our hunting and fishing culture.

David Strickland lowcountrywildlifemanagement@gmail.com
Matthew B matthewberens999@gmail.com
Nicholas Bur nicholasryanburn@gmail.com
Philip Messina philip_messina@hotmail.com
Matthew Poston matthew.poston@icloud.com
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Caleb Calandra calebcalandra@icloud.com and calebcalandra@yahoo.com
Hannah Pocock hpocock199@gmail.com
Laverne McDaniel mcdaniellaverne@ymail.com

Several people used an extended portion of the "Call to Action Alert" from Carolina Wildlife Syndicate. The list of senders is below the text. The dates of receipt were from 2/5/2021 thru 2/7/2021.
Stockings have proven to be beyond prescribed numbers in aquatic solutions by experts in this field. The results of these continued stockings are barren lakes devoid of any aquatic vegetation which represent the basic beginning elements of the food chain in an aquatic system. Wildlife species such as Great Blue Herons, Snowy Egrets, Osprey, waterfowl of all types , Bald Eagles and even Swallows benefit from aquatic vegetation. Of course our recreational fisheries are dependent upon such vegetation as well.

Further, the economies and cultures driven by waterfowl hunting, fishing and even bird watching, that help boost and sustain rural community economics, are further decimated by such stockings.

I do hereby formally oppose the proposals to continue stocking hybrid grass carp into the Santee Cooper lake systems and others at the rates presented and the further introduction of carp into the lake systems throughout our state of South Carolina.

At present, the effects of the carp stocking numbers have greatly altered the lakes as a whole habitat biome. Many species of fish and avian life that would normally thrive in such aquatic environments are neglected by such a plan.

The importance of a balanced wildlife ecosystem ranging from invertebrates to vertebrates is greatly ignored to detriment when there are actions in play that eradicate even the native submerged aquatic vegetation. These native aquatic plant species, and yes even some beneficial invasive species are the very building blocks of a healthy and functioning aquatic ecosystem.

As noted, these overly aggressive stocking actions not only cause great detriment to many species of wildlife and general water quality but also gravely effect the rural economies that center around hunting and fishing and other outdoor activities.

In a time of concern over water quality and South Carolina's ever decreasing wildlife habitat it's well past time that the APMC recognize these detrimental actions towards wildlife and water quality. Further, to continually ignore the amount of taxpaying citizens that have opposed such actions both past and present speaks negatively as an affront to the majority of recreational users and our hunting and fishing cultures.

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Response:

1) **Grass carp stocking objections.**
All triploid (sterile) grass carp stocked in South Carolina waters, private or public, are required to be tested to ensure they are triploid before being released. This is done to prevent breeding, which has caused problems with other carp species in other states. If the load being tested shows any evidence that all the fish are not triploid, the whole load is either dumped in a pit at the test site or escorted back to the state line.

Maintenance stocking of carp in public lakes which have *Hydrilla*, even if there are low acreage numbers or it is mixed in with native vegetation and not easily observable, is being done to ensure those acreage numbers remain low. The turions and tubers produced by *Hydrilla* can remain dormant for several years and sprout when the conditions are right. *Hydrilla* can produce up to 6000 tuber per square meter. *Hydrilla* can grow rapidly and quickly outcompete the native vegetation. If that occurs, larger stockings of carp are needed to effectively control the *Hydrilla*. Those larger stockings tend to cause problems because the fish start eating native vegetation once they have consumed the *Hydrilla* and it is almost impossible to remove the carp once they are put in a system. By doing smaller maintenance stockings, we can ensure lower numbers of carp in each waterbody to control *Hydrilla* and limit the impact on native vegetation. On the Santee Cooper system we are not recommending a true maintenance stocking (which we define as replacing mortality). We are recommending to stock less than the mortality rate to slowly lower the grass carp population. We believe a consistent low stocking provides better data and avoids reactive stocking events like the one that occurred in 2012 and 2013. Carp prefer to eat soft vegetation like *Hydrilla* and *Elodea*. They will seek those types of plants out first before they will eat most of our natives, especially the more fibrous species like water lilies and Eurasian milfoil. There is no evidence of carp eating eelgrass, which is more likely to be eaten by turtles. Carp also do not eat giant salvinia, which is why Santee Cooper wants to introduce salvinia weevils. These weevils will only eat the salvinia and are unlikely to overwinter.

The 10,000 triploid grass carp scheduled to be stocked into the Santee Cooper Lakes this year are below the mortality rate for that system. The overall number of grass carp there continues to decline. The Council decided four years ago to stock 10,000 carp per year for five years. This was done to slow the loss of carp through mortality while having yearly age class of fish to take their place. Having multiple ages classes in the system takes advantage of the higher feeding rate of the younger fish, which can also get into shallow water to consume newly sprouted *Hydrilla*. This will allow the population to be diverse in age while slowly reducing the total numbers. The goal is to have multiple age classes in the system with an overall coverage of 1 triploid carp for every 5-6 surface acres. At that point, we can make small adjustments to the annual mortality stocking rate to account for any changes in the *Hydrilla* population, which is being seen mixed in with native plants across the system. This decision was more favorable than introducing hundreds of thousands of triploid carp into the system periodically as a reaction to increasing numbers of hydrilla.

Hydrilla has been treated with herbicides in Lake Marion, Lake Moultrie, Lake Greenwood, and Lake Murray in 2018 and 2019 and in Lake Marion and Lake Moultrie in 2020.

2) **Objection to treating native species.**
Native species are only treated in limited instances where lake access or navigation is impeded, or water intakes are blocked. Santee Cooper treated 12 acres of native vegetation last year on a system that is 170,000 acres, which calculates out to less than 0.01% of the total acreage. In contrast, their hyperspectral imagery survey indicated there are 21,348.9 acres 13.38% coverage on 159,900

acres surveyed) of native species on their lakes, providing food and cover for fish and waterfowl. This does not account for any vegetation that was under tree cover.

One exception to this is in areas where cutgrass (aka white marsh) has taken over an area and created a monoculture which is unusable by most animals because it is extremely thick and is not a food source. In these cases, openings are created in those areas to allow other native vegetation to move back in and create a diverse habitat that will support fish and wildlife, as well as to allow access for hunters and fishermen. This type of action has been supported by the South Carolina Waterfowl Association and Ducks Unlimited. The former provided money a couple years ago to help fund that work and the latter is looking to do the same in the near future.

Our goal is to control the invasive species and let the natives continue to grow and expand, unless they fall in the limited instances listed above. We do not change this goal based on how rich or influential a requestor is. We follow science in making our decisions. Santee Cooper and SCDNR have worked to expand the natives by doing plantings of native species in areas that could support it. Santee Cooper has done that the past two years with eelgrass and water shield.

To get to this goal, an integrated management plan that includes herbicides, and biological control is needed. One commentor said we should follow the lead of the Tennessee Valley Authority (TVA) and their Guntersville Lake. Looking at the TVA lake management plan, they use all these things, plus mechanical control and lake drawdowns. We generally do not use mechanical control because it is slow, expensive, and not selective. It also tends to have lots of bycatch, including invertebrates and small fish. Mechanical control and lake drawdowns are also not possible on Santee Cooper due to the lake's morphology. Lake drawdowns are used on other waterbodies within the state.

3) **Stop spraying poisonous chemicals/herbicides.**
Aquatic herbicides are safer, and far less toxic than terrestrial herbicides. There are no aquatic herbicides which are classified as restricted use, as there are with terrestrial herbicides. When used properly, including those that are copper based, they are safe and effective. There have been some claims of aquatic herbicides causing cancer, but those claims have been scientifically disproven. The newer formulations of herbicides introduced to the market in the last 10 years are even more environmentally friendly. The product ProcellaCOR SC was formulated to California registration standards, is specific to crested floating heart and *Hydrilla*, and can be utilized to specifically control those invasives without affecting many natives.

4) **Let ecosystem behave as it naturally would.**
There are very few natural lakes in South Carolina. Most of them are oxbow lakes and Carolina Bays. Mother Nature's tendency is to try to return our man-made lakes to the rivers they once were by filling the lakes in. We have to work against that tendency by doing lake drawdowns, which dry and pack the soil along the edges. This controls some vegetation and provides good spawning areas for fish. Having an excess amount of vegetation, especially invasives, leads to stiller waters where sediment is deposited as well as more dead vegetation that degrades and helps to fill the lakes in.

5) **Remove *Hydrilla* from nuisance species list or consider it native.**
Hydrilla is a Federally listed invasive species which is included in 33 individual state's regulations and listed in Canada. It is very problematic if not controlled. No matter how long it is here, it will never be considered a native because it came from another part of the world.

6) **Carp stockings are feeding the growing cormorant population.**

Typically, double-crested cormorants eat fish that are less than 6 to 8 inches. See page 12 of https://www.aphis.usda.gov/wildlife_damage/reports/Wildlife%20Damage%20Management%20Technical%20Series/Cormorants-WDM-Technical-Series.pdf. The grass carp being stocked are 12" or larger.

7) **Vegetation clogging hydropower and drinking water intakes is due to carp feeding and cutting mats loose.**
The hydrilla mats that clogged the Santee Cooper hydroelectric intakes were before the introduction of grass carp. There have been a few minor issues over the years with other vegetation mats clogging water intakes. Mats of vegetation breaking loose is usually due to high water flows, not carp feeding activities as they generally eat from the top down.

8) **Management is damaging the economy.**
The Santee Cooper lakes have been listed in the top 25 by Bassmaster for the past 10 years and are number 23 on their recent list of best lakes of the decade (https://www.bassmaster.com/best-bass-lakes/slideshow/best-bass-lakes-2010s#slide48). Lake Murray, Strom Thurmond Reservoir, and Lake Hartwell fall in their "Best of the Rest" list for the southeast.
In 2017, it was estimated that the total economic contribution, of fishing hunting and wildlife viewing to South Carolina was $2.74 billion and the collective economic contribution of South Carolina's natural resource-based sectors had grown by 15% over the previous seven years (https://www.dnr.sc.gov/economic/index.html). Although this is slightly dated and doesn't show the direct impacts to areas around the waterbodies, there have been recent reports of increases in outdoor activities during the COVID-19 pandemic, including boating, hunting and fishing.

9) **Can invasives be eradicated?**
In most public waterbodies, it is unlikely that invasives will be eradicated. They can usually be controlled so that they are not problematic. They can sometimes be eradicated in small or private waterbodies.

10) **Educate the public so they don't proliferate the problem.**
SC DNR's Aquatic Nuisance Species Program works to educate the public by attending SEWE and the Sportsmen's Classic, working with boat dealers to encourage new boat owners to clean their boats after using it, providing information online (https://www.dnr.sc.gov/water/envaff/aquatic/index.html), and answering phone calls.
Santee Cooper has a YouTube channel where they have published several videos addressing natives and invasive species. They visit homeowner associations, fishing tournaments, boat clubs and have invited individuals and special interest groups to their office to discuss management strategies. Unfortunately, some people misconstrue things we say or don't believe what we say because they think they have a better source of information.

11) **Does cost sharing limit what is done on Santee Cooper lakes?**
No. Santee Cooper has their own budget to manage their lakes. SCDNR works with them on some projects.

12) **Cary Lake should be added to the plan.**
The plan does not cover privately owned lakes that do not provide public access. Cary Lake falls in that category.

13) **Hyacinth and salvinia should be added to the Hickory Top WMA section.**
This was an oversight during the work on the draft plan. It will be discussed at the meeting to approve the final plan.

Revised: 3/29/2021