Southeastern US Aquatic Weeds Crop Profile

Prepared: July 2013

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State Overviews

**Alabama** – Alabama has over 55 inches of average rainfall per year and groundwater resources for 77,000 miles of perennial and intermittent streams, 563,000 acres of ponds, lakes, and reservoirs and over 400,000 acres of estuaries. As of 2008, Alabama had identified 37 species as ANS (Aquatic Nuisance Species) or as having the potential to present problems in the near future. Alabama is home to more plants and animals than any other state east of the Mississippi River according to an article by B.A. Stein (AANSTF 2005).

**Georgia** – Georgia has 12,000 miles of streams, more than 500,000 acres of reservoirs, 192 miles of coast, and 23,000 miles of tidal waterways. The Georgia Invasive Species Advisory Committee has identified 28 ANS plant species that currently exist in Georgia or have a high probability of being introduced to the state (GDNR 2009).

**Louisiana** – Louisiana’s location and extensive network of water ways and swamps makes this state prone to the transport, settlement, and colonization of aquatic invasive species. Utilization of the state’s waterway network for transportation and recreation has compounded these issues. Given their shared and similar aquatic environments, many of the same aquatic invasive plants listed and managed by Louisiana are also listed as ANS for Mississippi (LDFW 2005).

**Mississippi** – Mississippi’s neighboring states of Florida and Louisiana are highly vulnerable to invasion by ANS species due to a subtropical climate, international ports, and extensive wetlands. The Mississippi Aquatic Invasive Species Task Force has focused its attention on ‘traditional’ aquatic invasive species and those that adversely impact aquatic pathways (MDEQ 2009).

**North Carolina** – North Carolina ranks 4th in inland water area with 2690 square miles of inland waters. These waters include shallow areas sounds and bays with varying degrees of salinity. There are also several natural lakes including Lake Mattamuskeet at over 50,000 acres. Man-made lakes have been created for flood control and hydroelectric power generation greatly affecting the natural ecology of inland impoundments. The Department of Environmental and Natural Resources has identified 33 plants as noxious aquatic weeds within the borders of North Carolina (NCDENR 2011).

**South Carolina** – South Carolina has four major river basins including the Savannah, ACE (Ashley, Combahee, and Edisto), Santee and Pee Dee. The river basins contain approximately 1,400 impoundments of 10 acres or more in size with a total surface area of 492,000 acres. Smaller water impoundments (e.g. farm ponds) total approximately 50,000. The state of South Carolina identifies aquatic plant problem areas from: information provided by South Carolina Aquatic Plant Management Council Members, an aquatic plant survey conducted by the South Carolina Department of Natural Resources staff, and the public. The 2011 South Carolina Aquatic Plant Management Plan reports that the state has 48 water bodies and 1 border-lake infested with invasive species (SCAISTF 2008).
Tennessee – Tennessee has three major river systems (Mississippi, Tennessee, and Cumberland Rivers) which contribute to 700,000 acres of impounded reservoirs and 19,000 miles of streams. The state of Tennessee has identified 22 ANS and ranked them according to degree of impact. Five criteria are used to identify ANS including ecological impacts, current distribution and status, trend in distribution and abundance, management difficulty, and economic impact. Hydrilla is identified as the number one detrimental species with brittle naiad identified as the second most detrimental species (TANSTF 2007).

Virginia – Virginia has ANS introductions occurring along a variety of pathways, or vectors, such as through intentional transport of a species for trade, or by accidental means, as in the case of stowaway species found in the ballast-water of ocean-going vessels. Losses due to invasive species in Virginia may be as high as one billion dollars annually. The Virginia Department of Game and Inland Fisheries identifies invasive species as a “crucial statewide conservation issue”. (VISC 2005)

Management Oversight by State

Alabama – Alabama’s Aquatic Plant Management Control Program and the Alabama Department of Conservation and Natural Resources conduct surveys to determine the presence of aquatic nuisance plants and methods for management. In 2005 the Alabama Aquatic Nuisance Species Task Force was established. It is comprised of 67 members representing 28 governmental, non-governmental, private, and university driven agencies/organizations (AANSTF 2008).

Georgia – Georgia’s Invasive Species Advisory Committee developed the Georgia Aquatic Nuisance Species Management Plan. The advisory committee also developed a Georgia Invasive Species Strategy that will serve as the State’s guiding document for terrestrial and aquatic invasive species control efforts in the coming years. The Georgia Department of Natural Resources is the primary state organization to respond to problematic invasive species for containment and removal. Georgia Power surveys lakes and reservoirs three to four times a year and applies spot treatments of herbicides when necessary (GDNR 2009).

Mississippi – Mississippi’s Aquatic Invasive Species Task Force was formed to create a state management plan for Aquatic Invasive Species. The task force was comprised of state and federal agencies, public and private universities, trade industries and stakeholders and is currently still under review. Due to complicated jurisdictions and state borders Mississippi’s plan was designed to complement the Louisiana State Management Plan for Aquatic Invasive Species. The Mississippi plan will coordinate all invasive management programs or activities regionally and locally to control the spread of ANS. The Mississippi Departments of Wildlife, Fisheries, and Parks and Department of Agriculture are the major monitoring and control agencies for the state (MDEQ 2009).
Louisiana – Louisiana aquatic plants are managed by the Louisiana Aquatic Invasive Species Task Force which was established on June 4, 2002. The Task Force is lead by the Louisiana Department of Wildlife and Fisheries which is responsible for designing and implementing the State Management Plan for Aquatic Invasive Species. The management plan describes the nature and extent of the environmental problem and proposes management practices deemed necessary to minimize the negative impacts of ANS. The purpose of the state management plan is to coordinate and support all invasive species eradication efforts from a single node under conditions of collaboration and full communication (LDWF 2005).

North Carolina – North Carolina’s Aquatic Weed Control Program is administered under the State Department of Environmental and Natural Resources, Division of Water Resources. The program is regulated by the Aquatic Weed Control Act of 1991, Amended 2006. This Act provides for regulatory authority and directs the program to provide control measures. The Act also designates plants as noxious aquatic weeds including the Federal Noxious Weed List and 14 additional species. The program develops an annual state management plan based on requests from local governments and other agencies, projects are completed as funding allows. The NC Department of Agriculture and Consumer Services also provides regulation of plants listed on the Federal Noxious Weed List (NCDENR 2011).

South Carolina – South Carolina manages invasive aquatics through the utilization of a Specialized Aquatic Plant Management Plan. The plan consists of a procedural plan and an annual operational management plan. A major component of South Carolina’s plan is the identification and analysis of aquatic plant problem areas. Appropriate control methods are then chosen ranging from complete eradication to removal from only a small area (SCAISTF 2008).

Tennessee – Tennessee’s Aquatic Nuisance Species Task Force was formed in 2005 developed the Tennessee Aquatic Species Management Plan. Management strategies focus on introduction pathways and are designed to control existing aquatic nuisance species to minimize adverse impacts on native species, water quality, and economies. The plan also emphasizes more enforcement and regulation, rapid response plans, and the further development of other plans for full partner participation (TANSTF 2007).

Virginia – Virginia passed the Invasive Species Council Act (ISCA) in 2003 and created the Invasive Species Control Council. The Virginia Invasive Species Management Plan was created for all invasive species including aquatic invasive species. The Virginia Departments of Conservation and Recreation and the Virginia Native Plant Society have created a Cooperative Project to identify alien plant species with potential invasiveness and to develop management solutions (VISC 2005)
Management Activities (Gettys et al. 2009)

Physical control practices:

- Aeration – Artificial circulation of water column using electric or solar power mixers, fountains, or compressed air diffuser systems to circulate and add oxygen to the water. Added oxygen expected to reduce the amount of available phosphorous resulting in less algae growth.
- Benthic barriers – Weed barriers that control aquatic plants through compression and blocking sunlight.
- Drawdown - Lowering of the water level to control invasive submerged species.
- Hand pulling – Dislodgement of an entire weed from substrate to prevent vegetative regrowth.
- Shading – Use of EPA-registered dyes or surface covers attempting to limit light penetration.

Mechanical control practices:

- Cutter and shredding boats – Submersed plants are cut by a barge and vegetation is allowed to flow downstream or to salt water.
- Harvesters and removers – Most widely used type of equipment for mechanical control in the United States. Hydraulically operated cutter head cuts the plants and stores them in a storage bay and later disposed of.

Biological control:

- Classical biocontrol – Introduction of a natural enemy to from a nonnative invasive plants native range.
- Non – classical biocontrol – Mass rearing and periodic release of resident or naturalized nonnative aquatic weed biocontrol agents to increase the effectiveness of invasive species control.

Chemical Control of Aquatic Weeds:

- Registered aquatic herbicides and algaecides are widely used for either broad spectrum control of numerous plant species or a targeted specific plant control.
- Examples (copper, endothall, diquat, carfentrazone, 2,4-D, triclopyr, glyphosate, imazapyr, fluridone, penoxsulam, imazamox)

*Appendix A of this document contains herbicide application methods for the four aquatic plant growth forms (submersed, free-floating, rooted floating, and emergent flowering plants)

*Appendix B of this document shows the effectiveness of chemical and biological control options in North Carolina ponds
Weed Species

*Alternanthera philoxeroides (Mart.) Griseb* (Alligatorweed)

Heavily impacted areas: canals, ditches, lakes, shorelines

Southeastern states with noted issues: AL, GA, LA, MS, NC, SC, TN, VA

Regulation (states): AL, GA, MS, SC, TN, VA *

Means of introduction and spread: Contaminated container ship ballast water was likely the means of first introduction with the earliest specimen found in South Carolina in 1885. Invasive spread was first recognized during the 1950s after extensive Water Hyacinth control programs cleared waterways allowing alligatorweed to flourish.

Impacts: Alligatorweed forms dense floating mats that may have hollow stems up to 1 meter long. Growth and spread completely covers waterways, drains, and water intake valves resulting in economic losses and increased risk of flooding. Ecologically, the weed limits light penetration and has the capacity to outperform native species. Recreational access is also hindered by alligatorweed.

Management techniques:

- Physical control
- Biological control
- Chemical control

Distribution map:


* Regulation information provided by Bergeron et al 2009 via Invasive.org
**Egeria densa Planch.** (Brazilian Waterweed)

Heavily impacted areas: lakes, ponds, reservoirs, sloughs, streams

Southeastern states with noted issues: AL, GA, LA, MS, NC, SC, TN, VA

Regulation (State): AL, SC, TN, VA

Means of introduction and spread: Brazilian Waterweed originated in South America and has spread to the United States through the aquarium trade. The submersed herb was likely introduced to natural areas through aquarium dumping. Plant fragments are easily transported by boats and boating equipment as well as natural water movement. Once fragmented stems are introduced they are capable of regeneration.

Impacts: Brazilian Waterweed forms dense monotypic stands that displace native aquatic plants and degrade wildlife habitat. The dense growth may also limit recreational activities such as fishing, swimming, and boating. Water quality is affected due to increased sedimentation and the vegetation may retard water flow interfering with irrigation projects and hydroelectric utilities.

Management techniques:

- Physical control
- Biological control
- Chemical control

Distribution map:

Resources: (Morgan 2009, *Egeria Densa*); (University of Maine Coop Ext 2004)
**Eichhornia crassipes (Mart) Solms.** (Water Hyacinth)

Heavily impacted areas: canals, ditches, lakes, ponds, rivers

Southeastern States with Noted Issues: AL, GA, LA, MS, NC, SC, TN, VA

Regulation (states): AL, GA, MS, SC

Means of introduction and spread: Water hyacinth is native to Brazil and was introduced into the US in 1884 at an exposition in New Orleans. The plant, although regulated in some states, is still sold in other states for aquaria and water gardens. The primary means of reproduction is vegetative by rhizomes and stolons. Plants may be transported on boat trailers, hulls, and accessories. Plant biomass may double in size in as little as 6-18 days. The plant may root on land with sufficient moisture but is primarily an aquatic plant.

Impacts: Water Hyacinth creates mats that clog waterways, making boating, fishing and all other water activities impossible. These mats block sunlight, change water temperatures, increase eutrophication, and limit water flow resulting in a reduced oxygen levels. Evaporation from leaf surfaces is three to four times higher than what is lost by evaporation from free water surface alone (AWS pg 420). Biological diversity is greatly reduced as well.

Management Techniques:

- Physical control
- Mechanical control
- Biological control
- Chemical control

Distribution map:

Resources: (Jacono et al. 2007); (Ramey 2001)
**Hydrilla verticillata (L.F.) Royle** (Hydrilla)

Heavily impacted areas: canals, lakes, ponds, rivers

Southeastern states with noted issues: AL, GA, LA, MS, NC, SC, TN, VA

Regulation (states): US law, AL, GA, MS, NC, SC, TN, VA

Means of introduction and spread: Hydrilla was first reported in the United States in Florida in the 1950’s as the dioecious biotype. It was used in aquariums and was later planted or discarded into canals of Tampa and Miami. The monoecious biotype was first documented in North Carolina 1980.

Hydrilla spreads easily through fragmentation and may be transported on recreational boats and accessories. These fragments root readily and develop new colonies, often first appearing near boat ramps.

Impacts: Once established Hydrilla grows aggressively and competitively, forming thick mats in shallow areas blocking sunlight penetration to native plants. Physical and chemical characteristics of water bodies are also altered. Stratification of the water column results in decreased oxygen levels and fish kills. Dense hydrilla infestations have been reported to reduce sportfish weight and size in lakes. Heavy growth may result in obstruction to boating, swimming, fishing, power generation, and agricultural irrigation.

Management techniques:

- Physical control
- Mechanical control
- Biological control
- Chemical control

Distribution map:

Resource: (Jacano et al. 2008)
**Landoltia punctata** (G. Mey.) D.H. Les & D.J Crawford (Dotted Duckweed)

Heavily impacted areas: backwaters, ditches, ponds, swamps

Southeastern states with noted issues: AL, GA, LA, MS, NC, SC, TN, VA

Regulation: N/A

Means of introduction and spread: Dotted duckweed originated in Australia and Southeast Asia and was first noted in worldwide harbors in the 1800’s, likely transported in ship ballast. The weed is commonly used for aquariums and is also distributed when transporting fish or plants. Once introduced the plant may be transported by water fowl or mammals.

Impacts: Dotted Duckweed has a high rate of vegetative propagation and may outcompete native species.

Management techniques:

- Mechanical control
- Chemical control

Distribution map:

Resources: (Jacono 2002); (Aquaplant 2011)
*Ludwigia grandiflora* (Michx.) Greuter & Burdet (Water Primrose)

Heavily impacted areas: borrow pits, ditches, marshes, ponds

Southeastern states with infestation: AL, GA, LA, MS, NC, SC, VA, TN

Regulation: SC

Means of introduction and spread: Creeping water primrose is native to South America and grows in an emergent or floating-stem growth form.

Impacts: Water primrose forms monospecific stands that shade out native species. Decaying mats deoxygenate water with potential damage to fish stocks and other fauna. Large amounts of plant biomass may also increase sedimentation.

Management techniques:

- Physical control
- Mechanical control
- Biological control
- Chemical control

Distribution map:

**Murdannia keisak (Hassk.) Hand.-Maz** (Marsh Dewflower)

Heavily impacted areas: lakes, marshes (freshwater and tidal), ponds, streams

Southeastern states with infestation: AL, GA, LA, MS, NC, SC, TN, VA

Regulation: SC, TN, VA

Means of introduction and spread: Marsh dewflower’s native range is Eastern Asia and introduced to the United States via rice imported to Louisiana and South Carolina in the 1930s. Since then it has spread into the coastal plain and piedmont regions of the Southeastern United States. Marsh dewflower is mainly spread by wildlife but may also be transported by natural water movement.

Impacts: Marsh dewflower forms dense mats of vegetation that outcompete native species causing both ecological and economic problems.

Management Techniques:

- Physical control
- Chemical control

Distribution map:

Resources: (Morgan 2009); (University of Georgia 2011)
Myriophyllum aquaticum (Vell.) Verde. (Parrotfeather)

Heavily impacted areas: backwaters, lakes, ponds, streams, wetlands lakes
Southeastern states with infestation: AL, GA, LA, MS, NC, SC, TN, VA
Regulation: AL, GA, TN, VA

Means of introduction and spread: Parrotfeather is native to South America and may have either submersed or emergent leaves. The characteristic submersed growth allows for it to be often mistaken for Eurasian Watermilfoil. Although, regulated in some states, it is an attractive plant that is easy to cultivate. Parrotfeather has been introduced worldwide for indoor and outdoor aquaria and ultimately made it into native ecosystems of the US. The aquatic plant spreads via plant fragments and intentional planting.

Impacts: Parrotfeather, after introduction, will spread and change the physical and chemical characteristics of lakes and streams. The plant impacts shades out phytoplankton and native vegetation. Parrotfeather also provides a larval breeding ground for mosquitoes that may serve as a vector for disease spread. Inhibition of drainage and irrigation systems is also a major problem.

Management techniques:

- Hand removal
- Water draw down
- Machine harvesters
- Biological
- Herbicide

Distribution map:

Resources: (State of Washington 2011); (Wersel 2011)
**Myriophyllum spicatum** L. (Eurasian watermilfoil)

Heavily impacted Areas: brackish water, ponds, rivers, springs

Southeastern States with Infestation: AL, GA, LA, MS, NC, SC, TN, VA

Regulation: AL, NC, SC, TN, VA

Means of Introduction and Spread: Eurasian watermilfoil was first found in Washington, DC in 1942. Origin of the plant is assumed to be from either Eurasia or North Africa via ship ballast. Spread occurs by fragmentation by boats, other vehicles, and water currents.

Impacts: Eurasian watermilfoil infestations form after introduction which shade out and replace native plants. These changes to the ecosystem negatively affect birds by reducing their food resources. Fish are affected by reduced water quality. High densities of the weed reduce the abundance and density of invertebrates (organisms that serve as fish food). Death of the invasive reduces oxygen levels in a water resource. Dense beds may inhibit swimming, fishing, boating, clog water intakes, and foul lakeside beaches with dead vegetation.

Management techniques:

- Physical control
- Mechanical control
- Biological control
- Chemical control

Distribution map by USGS

Resources: (Collete et al 2008); (Ramey 2001, Eurasian Water-milfoil)
**Najas minor** All. (Brittle Naiad)

Heavily impacted areas: lakes, ponds, reservoirs

Southeastern states with infestation: AL, GA, LA, MS, NC, SC, VA, TN

Regulation: AL, SC

Means of introduction and spread: Brittle naiad was first collected in 1932 in Ohio. The main route of introduction is unclear but it was likely cultivated with other plants and used for aquariums. The plant spreads easily by fragmentation. Brittle naiad is carried by waterfowl and attaches to boats and trailers for transport.

Impacts: Brittle naiad forms dense monospecific stands in water up to 12 feet. After introduction the plant inhibits the growth of aquatic macrophytes and hinders swimming, fishing, and boating.

Management techniques:

- Chemical control

Distribution map by USGS

![Distribution map of Najas minor](image)

Resources: (Cao 2009, Najas minor); (Stratford 2011)
**Panicum repens** (Torpedo-grass)

Heavily impacted areas: Agricultural fields, rivers, streams, wetlands

Southeastern states with infestation: AL, GA, LA, NC, SC, TN, VA

Regulation: AL, GA

Means of introduction and spread: Torpedo-grass grows in or near shallow waters and can quickly displace native species. The plant occurs from Florida to Texas in the Southeast, northward along the Atlantic Ocean to North Carolina particularly in wetland or marginal habitats. It is native to Africa and/or Asia and was introduced to the United States before 1876 primarily through seed used for forage crops. In the 1900’s the US Department of Agriculture imported and distributed Torpedo-grass seed for planting in pasturelands to provide forage for cattle.

Impacts: Torpedo-grass is one of the most invasive exotic grasses of terrestrial, wetland, and aquatic habitats of the tropics and subtropics. It is now listed as a category I invasive species because of its ability to invade and alter other communities. The plant may interfere with flood control, navigation, irrigation, recreation, and turf production.

Management techniques:

- Mechanical control
- Chemical control

Distribution map by USGS

Resource: (Smithsonian 2007); (USGS 2009, Panicum repens)
**Salvinia molesta Mitchell** (Giant Salvinia)

Ecology: ponds, lakes, marshes, rivers, streams

Southeastern states with infestation: AL, GA, LA, MS, NC, SC, VA

Regulation: US law, GA, MS, NC, SC

Means of introduction and spread: Giant salvinia is spread primarily by human transport and is originally from Brazil. The plant has copious leaf hairs and deeply embedded lateral buds that provide protection from desiccation. Plants adhere to boats, trailers, vehicular wheels, motor intakes, fishing, and recreational gear. Commonly the plants are found near boat ramps and along roads. Spread continues through natural drainage and watershed systems. Wind and current are the main means of natural transport.

Impacts: Spreads readily creating a monoculture rapidly shading underwater native plants. This may result in large bottom areas having no growth of native species. Dense colonies may provide habitat for micro invertebrates until it completely covers a water body surface resulting in oxygen depletion.

Management Techniques:

- Physical control
- Chemical control

Locations provided by USGS:

Resources: (Howard 2008); (University of Florida IFAS Giant Salvinia, 2011); (Aquaplant, Giant Salvinia 2011)
**Wolffia Spp.** (Watermeal)

Heavily impacted areas: canals, lakes, ponds, rivers, streams, swamps, sloughs, wetlands

Southeastern states with infestation: AL, GA, LA, MS, NC, SC, TN, VA

Regulation: N/A

Means of Introduction and Spread: Watermeal and other Lemnaceae are some of the most highly reduced flowering plants. The family is divided into 5 genera. *Lemna, Landolita, Spirodea, Wolffia, and Wolfiella*. Plants reproduce primarily by budding from a single funnel-shaped pouch at the end of the plant.

Impacts: Watermeal and other duckweeds may form a mat on the surface and shade out submersed plants. They may clog the intakes of potable water supplies and irrigation pumps. Navigation in areas of infestation may also be an issue. Watermeal is considered a valuable food for waterfowl.

Management Techniques:

- Physical control
- Chemical control

Distribution map by USGS (Not Available)

Resources: (Aquaplant, Watermeal 2011); (Army Corp 2009)
Appendix A: **Herbicide Application Methods for the Four Aquatic Plant Growth Forms (Ross et al. 2009)**

**Aquatic Herbicide Types:**

**Contact:**
- Rapid results
- Burn plant tissues
- Plants drop within a week or so
- Tend not to be selective
- Ex. endothall, diquat

**Translocated:**
- Move primarily in the phloem to growing points
- Selectivity achieved by placement
- Ex. glyphosate, imazapyr

**Example Herbicides and Application Methods for Aquatic Growth Forms**

**Submersed Flowering Plants:**
- Treatment: Injecting, pouring, or spraying the liquid forms of herbicides
- Contact: diquat and potassium salts are standard treatments
- Translocated: 2,4-D, triclopyr, fluridone

**Free-floating Flowering Plants**
- Sprays of diquat, glyphosate, triclopyr, and liquid 2,4 D are used as sprays
- Fluridone is applied through the water

**Rooted Floating Flowering Plants**
- Diquat, endothall salts, and fluridone are labeled for pondweeds
- Glyphosate and 2,4 D are commonly used for waterlilies and spatterdock

**Emergent Flowering Plants**
- Glyphosate, 2,4 D, triclopyr, and imazapyr are commonly used herbicides
- 2,4 D and triclopyr may treat herbaceous and woody broadleaves
- Giant reed, common reed, melaleuca may be treated with imazapyr
Appendix B: Effectiveness of Herbicides and Triploid Grass Carp for Control of Weeds Commonly Found in North Carolina Ponds

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<th>Weeds</th>
<th>2,4-D</th>
<th>Carfentrazone</th>
<th>Copper compounds</th>
<th>Disuicide</th>
<th>Disuicide-supper</th>
<th>Atrazine</th>
<th>Hydroxan</th>
<th>Flumetsulam</th>
<th>Glyphosate</th>
<th>Imazquinol</th>
<th>Imazapyr</th>
<th>Periodic compounds</th>
<th>Penoxsulam</th>
<th>Triclopyr</th>
<th>Triclopyr-butyl</th>
<th>Triploid grass carp</th>
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**TABLE 8-24. EFFECTIVENESS OF HERBICIDES AND TRIPLOID GRASS CARP FOR CONTROL OF WEEDS COMMONLY FOUND IN NORTH CAROLINA PONDS**

Key: NR = Not Recommended; P = Poor; G = Good; ID = Insufficient Data; F = Fair; E = Excellent

Appendix C: Southeastern US ANS Contacts

**Alabama:**

Alabama Department of Conservation and Natural Resources
Wildlife and Freshwater Fisheries Division
Phone: (334) 242 – 3465

Alabama Invasive Plant Council
Nancy J. Loewenstein
Auburn University Extension Specialist
Phone: (334) 844 – 1061
Email: loewenj@auburn.edu

U.S. Army Corps of Engineers, Mobile District
General Information
Phone: (251) 690 - 2505

**Georgia:**

Georgia Department of Natural Resources
Wildlife Resources Division (Headquarters Office)
Phone:(770) 918 – 6418

University of Georgia
Warnell School of Forestry and Natural Resources
Susan Wilde
Email: Swilde@warnell.uga.edu
Phone (706) 542-3346

**Louisiana:**

Louisiana State University
Idlewild Research Station
Email: dsanders@agcenter.lsu.edu
Phone: (225) 683-5848

Louisiana Wildlife and Fisheries
Aquatic Plant Control
Alex Perret
Email: aperret@wlf.la.gov
Phone: (225) 765 - 2328

**Mississippi:**

Mississippi State University
Plant and Soil Sciences
John Madsen
Email: jmadsen@gri.msstate.edu
Phone: (662) 325-2428

U.S. Army Corps Engineer Research and Development Center
Environmental Laboratory, Vicksburg, MS.
Linda Nelson
Email: Linda.S.Nelson@usace.army.mil
Phone: (601) 634-2656
Mississippi Wildlife, Fisheries, and Parks
Central Region
Jerry Brown
Phone (601) 859 – 3421

North Carolina:

North Carolina Department of Environment and Natural Resources
Rob Emens
Email: Rob.emens@ncdenr.gov
Phone: (919) 715 – 5452

North Carolina State University Crop Science
Aquatic Plant Management
Rob Richardson
Email: Rob_richardson@ncsu.edu
Phone: (919) 515 – 5653

North Carolina State University Crop Science
Aquatic Plant Management
Steve Hoyle
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Phone: (919) 495 – 0899

South Carolina:

Clemson University Department of Forestry and Natural Resources
John Rodgers
Email: Jrodger@clemson.edu
Phone: (868) 656 - 0492

South Carolina Department of Natural Resources
Aquatic Nuisance Species Program
Chris Page
Phone: (803) 755 – 2836
Email: pagec@dnr.sc.gov

Tennessee:

Tennessee Department of Environment and Conservation
Brian Bowden
Phone: (615) 532-0436
Email: Brian.bowden@state.tn.us

Tennessee Valley Authority
General Contact Information
Email: tvainfo@tva.gov
Phone: (865) 632 – 2101

University of Tennessee Weed Science
Neil Rhodes
Email: Nrhodes@utk.edu
Phone: (865) 974 – 7324
**Virginia:**

Virginia Department of Conservation and Recreation  
Email: pco.dcr@virginia.gov  
Phone: (804) 786 – 7951

Virginia Tech  
Plant Pathology, Physiology, and Weed Science  
Lloyd Hipkins  
Email: lhipkins@vt.edu  
Phone: (540) 231 - 7477

**Appendix D: Aquatic Invasive Species Programs and Activities: Southeastern US Summary**

Excerpts From:


The Environmental Law Institute, & Environmental Protection Agency. (2007, January). Appendix a: Aquatic invasive species programs and activities: 50-state summary. Retrieved from Effects of Climate Change on Aquatic Invasive Species and Implications for Management and Research website:  
http://oaspub.epa.gov/eims/eimscomm.getfile?p_download_id=468138

**Alabama**

*AIS Programs & Activities*

- Aquatic Plant Management Control Program, Alabama Department of Conservation & Natural Resources (DCNR) - Division of Wildlife and Freshwater Fisheries (DWFF) and U.S. Army Corps of Engineers - Mobile District.

- Private Waters, Alabama DCNR - DWFF.

- Mobile Bay National Estuary Program, Alabama-Mississippi Rapid Assessment Team (AMRAT).

**Georgia**

*AIS Programs & Activities*

- AIS management activities, Georgia Department of Natural Resources (DNR) - Wildlife Resources Division, Fisheries Management.

- Survey of lakes and reservoirs, Georgia Power (a regional utility) and DNR - Wildlife Resources Division, Fisheries Management.

**Louisiana**

*AIS Programs & Activities*

- The Louisiana Aquatic Invasive Species Task Force
• Aquatic Plant Control Fund.

• Aquatic Plant Management Program, LDWF.

• Outreach activities, conducted by many organizations that use some state funds in addition to other funds, including Louisiana Sea Grant College Program, Barataria-Terrebonne Estuary Program, and The Nature Conservancy, among others.

**Mississippi**

*AIS Programs & Activities*

• Control, Mississippi Department of Wildlife, Fisheries, and Parks (MDWFP).

• Monitoring and control, Mississippi Department of Agriculture and Commerce (MDAC) – Bureau of Plant Industry and USDA Animal and Plant Health Inspection Service (APHIS) – Plant Protection and Quarantine (PPQ).

• Coastal Preserve Program (giant salvinia), Mississippi Department of Marine Resources (MDMR).

• Alabama-Mississippi Rapid Assessment Team (AMRAT).

**North Carolina**

*AIS Programs & Activities*

• Aquatic Weed Control Program, North Carolina Department of Environment and Natural Resources (NC DENR) - Division of Water Resources.

• Weed Regulatory Services, North Carolina Department of Agriculture and Consumer Services (NCDA&CS) - Plant Industry Division - Plant Protection Section.

• Giant Salvinia Task Force (GSTF)

• North Carolina State University Aquatic Weed Management Program

**South Carolina**

*AIS Programs & Activities*

• Aquatic Nuisance Species Program, South Carolina Department of Natural Resources (SCDNR) and the South Carolina Aquatic Plant Management Council

• Analytical and Biological Services, Santee Cooper (South Carolina Public Service Authority, a quasi-public entity).

**Tennessee**

*AIS Programs & Activities*

• Aquatic plant management, Nickajack Reservoir, The Tennessee Valley Authority (TVA) and Marion County.
• Aquatic plant management, Chickamauga Reservoir, The Tennessee Valley Authority (TVA) and private homeowners.

• Monitoring and eradication, Obed Wild and Scenic River.


• Monitoring and control, Metro Park System, Belmont University.


• Eradication, Big South Fork National Recreation Area.

• Eradication Program, Oak Ridge National Laboratory (ORNL).

**Virginia**

*AIS Programs & Activities*

• Cooperative Project, Virginia Department of Conservation and Recreation (VDCR) and Virginia Native Plant Society.

• Legislation, Virginia Legislature. The Aquatic Invasive Species Act increased criminal and civil penalties and gave the Board authority to add additional aquatic nuisance species. The law applies to any species with the potential to cause statewide impact.


**Appendix E: Southeastern States Aquatic Invasive Species Management Plans**


Appendix F: Crop Profiles for the Southeastern United States


Crop profile references:


University Of Florida IFAS. (2011). Giant salvinia. Retrieved from Center for Aquatic and Invasive Plants website: http://plants.ifas.ufl.edu/node/396
