

# South Carolina Dec 2008 update to GSARP

David Knott

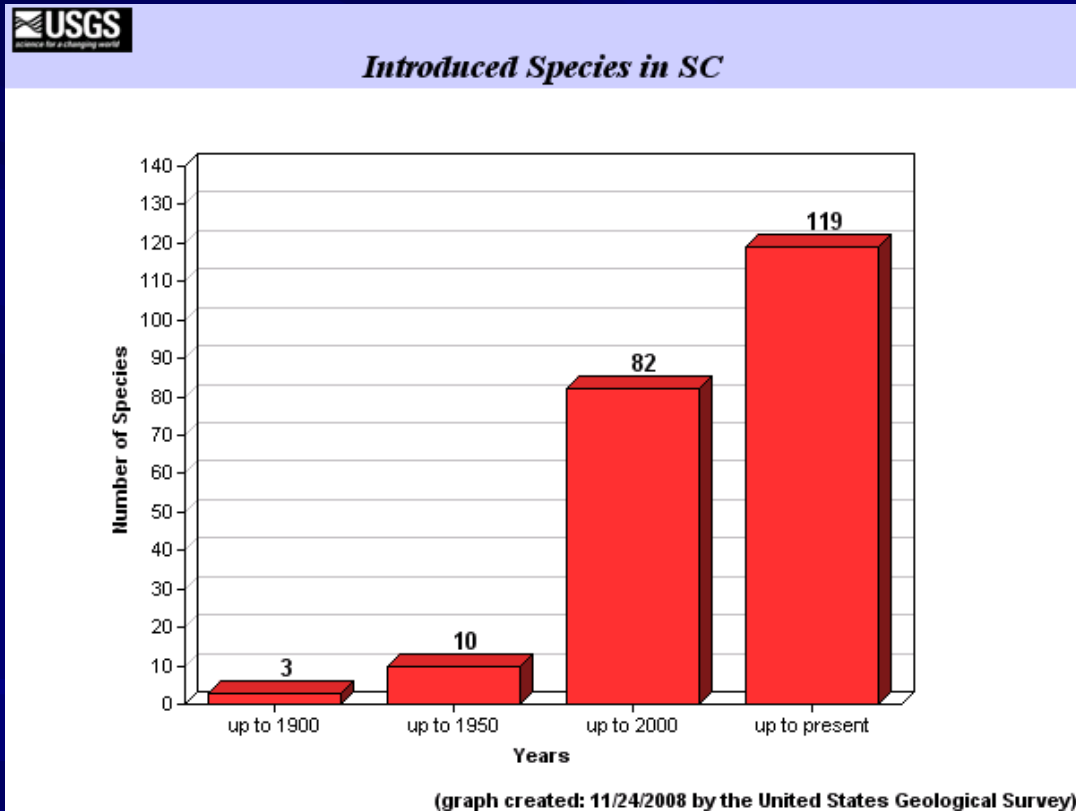
Marine Resources Research Institute  
SC DNR



DNR

# USGS NAS Database

## SC updates continue



➤ state query yields 134 spp.

➤ 42 fish

➤ 37 plants

➤ 53 invertebrates

➤ 2 reptiles

➤ graphics link needs to be updated

➤ 9 spp. of invertebrates to be added

# Non-indigenous Aquatic Invertebrates in South Carolina

added to list since last SC update  
anticipated future arrivals

## Algae

- Chlorophyceae.....*Codium* sp. (? *scandinavicum*)  
*Codium fragile* var. *tomentosoides*  
 Rhodophyceae.....*Polysiphonia breviarticulata*

## Protozoans

- Haplosporidians.....*Haplosporidium nelsoni*  
 (oyster disease MSX)

## Cnidarians

- Hydrozoans.....*Garvia franciscana*  
 Scyphozoans.....*Craspedacusta sowerbyi*  
*Phyllorhiza punctata*

- Monogeneans (flukes).....*Pseudodactylogyrus bini*  
*Pseudodactylogyrus anguillae*  
 ? *Gyrodactylus anguillae*

- Nematodes.....*Anguillicoloides crassus*

## Annelids

- Polychaetes.....*Ficopomatus enigmaticus*  
*Ficopomatus miamiensis*

## Mollusks

- Fresh. Gastropods .....*Pomacea insularum*  
*Pomacea paludosa*



- Bivalves.....*Mytella charruana*  
*Teredo navalis*

- Barnacles.....*Megabalanus coccopoma*  
*Megabalanus tintinnabulum*

- Ascidians.....*Styela plicata*  
*Styela conopus* [was *S. partita*]  
*Molgula manhattensis*  
*Diplosoma listerianum*

*Pomacea insularum*, the island apple snail

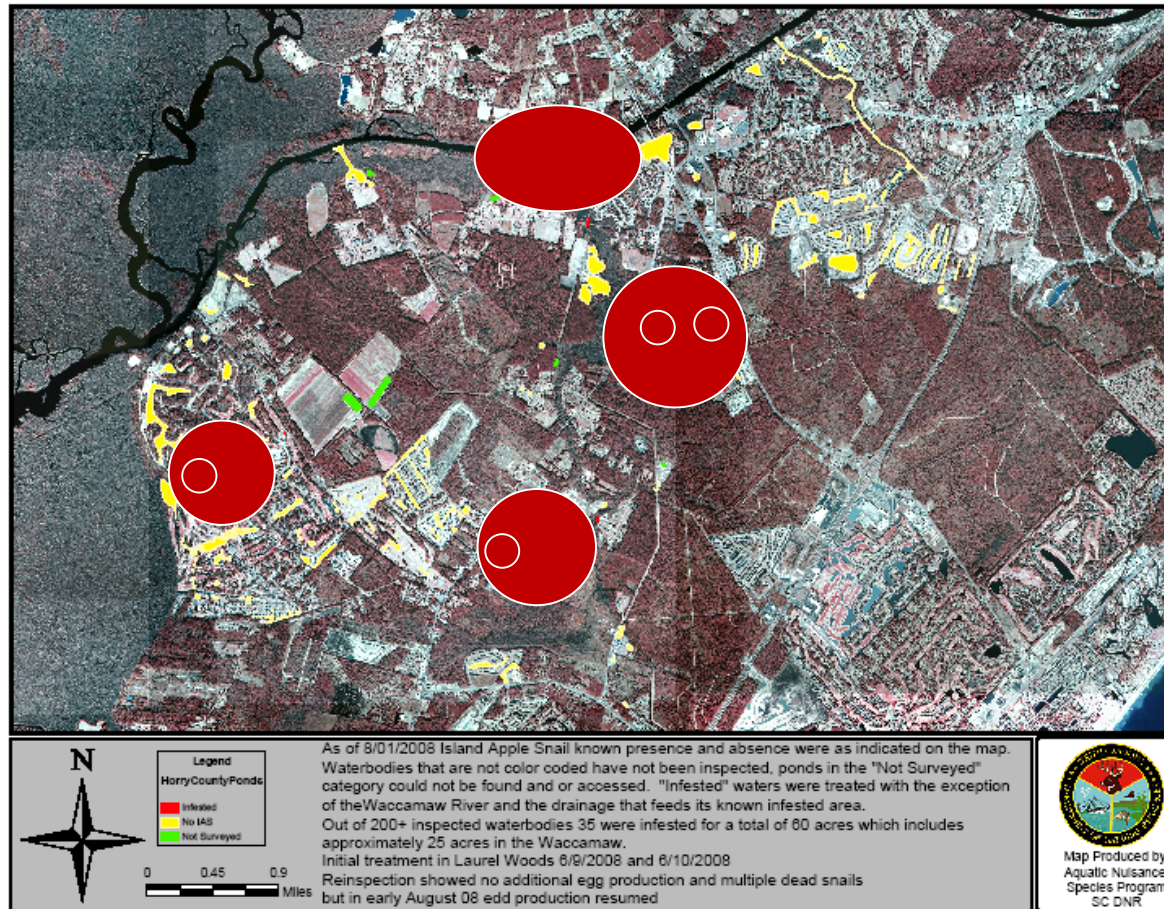


Pink egg masses up to 2" long



Large channeled apple snail in the 'canaliculata complex' up to 3" in height

## Horry County Island Apple Snail Report



- snails found in 39 of 200+ inspected water bodies
- 110 acres, 25 in the ICWW/Waccamaw system
- treatment: hand picking of egg masses, subsequent Cu sulfate application; success limited; treatment suspended until spring



# *Pomacea paludosa*

- native Florida apple snail
- in SC for at least 15 yrs
- hitchhiked on pickerelweed imported from FL for golf course aquascaping

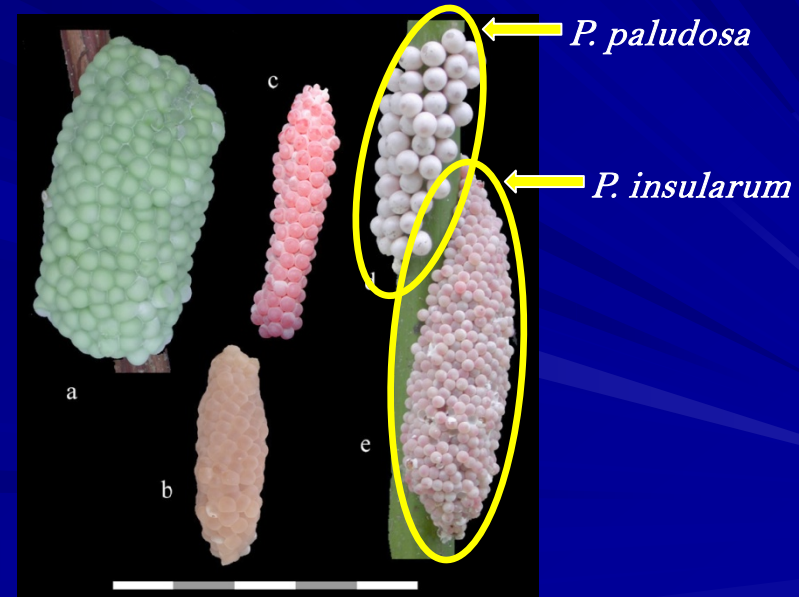
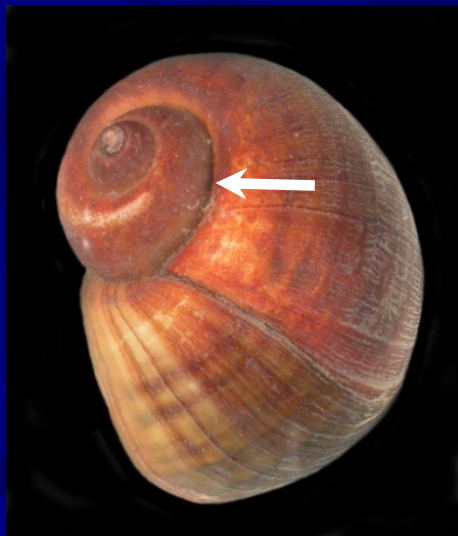


photo from Rawlings et al., 2007

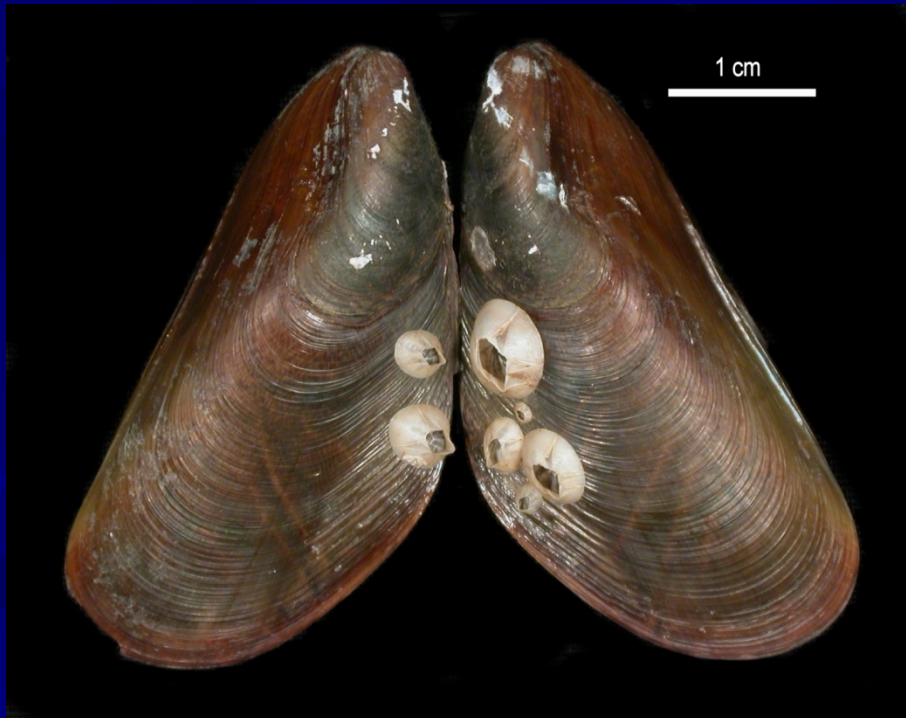


*Pomacea insularum*

*Pomacea paludosa*

# *Mytella charruana*, the charrua mussel

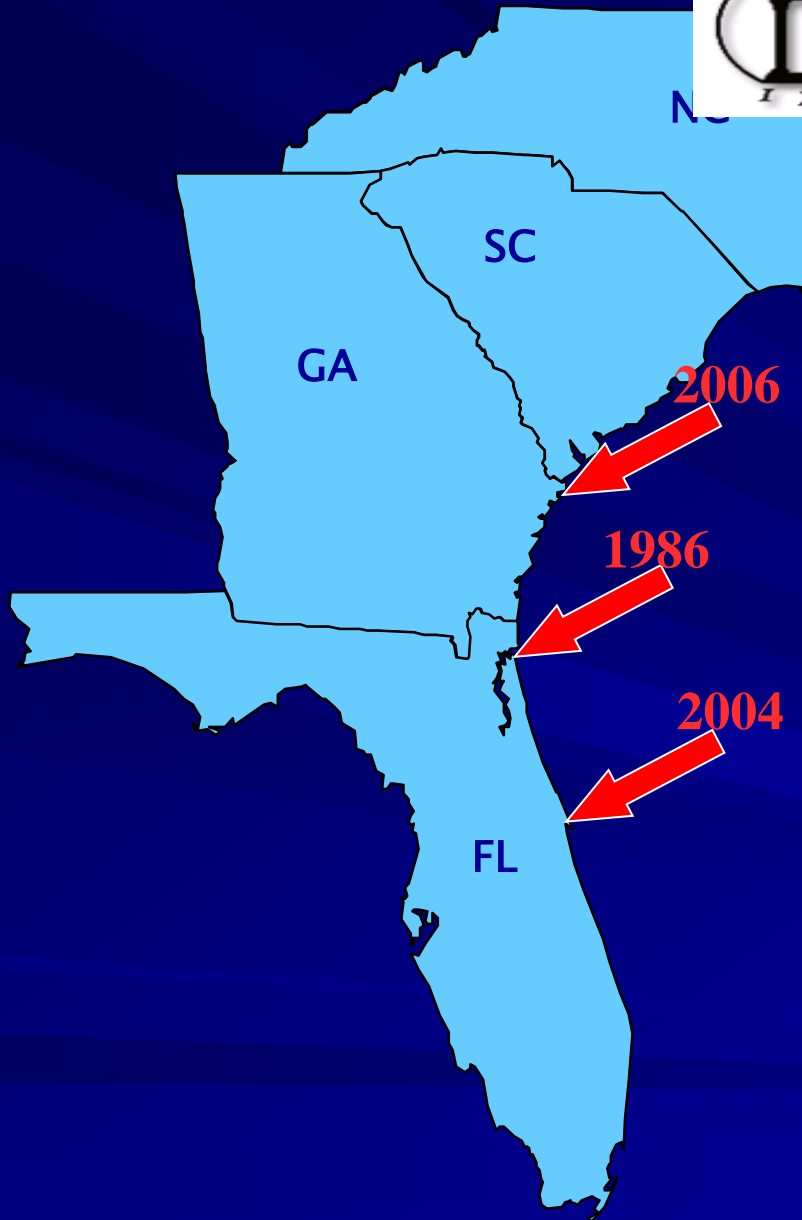
- another South American native
- same family as the Asian green mussel and the commercial native blue mussel from the mid and north Atlantic states





THE UNIVERSITY OF GEORGIA

MARINE EXTENSION SERVICE  
SHELLFISH RESEARCH LABORATORY



became established as the population died off that winter. In August 2004, *Mytella* was discovered in the Mosquito Lagoon portion of the Indian River Lagoon. Since this discovery, *Mytella* numbers have increased, suggesting the mussels are reproducing. As of April 2006, 578 individuals have been collected in Mosquito Lagoon.

#### What Is Being Done?

The Nature Conservancy has teamed up with the University of Central Florida to determine the potential invasiveness of this species. Starting in the summer of 2006, lagoon-wide surveys will be conducted to determine *Mytella charruana*'s distribution, and genetic tests will be conducted to learn more about its make-up.

ganize the shells in color and has rings. Close inspection dark (brown, purple) light (cream) pattern is iridescent be distinguished from native mussels (*Gemma* and *Brachiodontes* distinct ridges (rib) the shells (see photo).

#### Why We Are Concerned

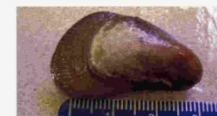
*Mytella charruana* may mean less for native organisms, especially important native oysters. *Mytella charruana* can infest and clog intake

#### How You Can Help

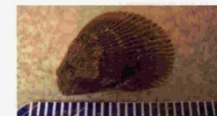
Be on the look out for *Mytella charruana*. Collect all specimens that you find; record the date and precise location (including the nearest landmark, GPS coordinates if available, and substrate found on); and preserve specimens in rubbing alcohol. Please send this information to Dr. Linda Walters, Biology Department, UCF, Orlando, FL 32816, (407) 823-2148, [ljwalter@pegasus.cc.ucf.edu](mailto:ljwalter@pegasus.cc.ucf.edu).



*Mytella charruana*



*Qukenia demissa*



*Brachiodontes* spp.

The mission of The Nature Conservancy is to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive.

photos by Harry Lee, Jacksonville Shell Club

commercial barges at moorings  
in ICWW south of Charleston



~two years worth of hull fouling

routine travel between Norfolk,  
VA and Jacksonville, FL





➤ estimated number on barge  
1000-4000

➤ 2 live mussels found on crab  
pot float in ACE Basin NERR  
invasive spp. survey funded by  
SCDNR (program cancelled)

➤ pre-proposal to NOAA's  
AISP for development of  
FY09 operating plan  
(program area: identification  
of risks to NOAA trust  
resources associated with  
vessel biofouling)

A Preliminary Assessment of the Occurrence of the Invasive  
Asian Green Mussel, *Perna viridis*, in South Carolina



A Report to  
the South Carolina Sea Grant Consortium

by  
David M. Knott, Elizabeth L. Wenner and Rachael A. King

Marine Resources Research Institute  
Marine Resources Division  
South Carolina Department of Natural Resources

October 31, 2008

Grant # R11C-R110  
NOAA NA06OAR4170015

# *Perna viridis*

- Report delivered to Sea Grant on preliminary surveys for Asian green mussels in SC
- modest number detected during spring sampling in 2007 and 2008
- thousands discovered on a single barge during hull maintenance



Photo by Lisa Moore, NC Dept Envir Nat Res  
from Pamlico Sound, NC

# *Penaeus monodon*

- 7 individuals reported to SCDNR
- in 2008

➤ continues trend that began in 2006 in SAB

➤ two indiv. as late as last week



Aquaculture escapement?  
Source? (DNA analysis)  
Breeding population in SAB?



Photo by Robert Overton, GA Marine Ext Serv  
from off St. Augustine, FL

*P. monodon* - > ½ pound  
caught recently by commercial  
trawler off Hilton Head Island

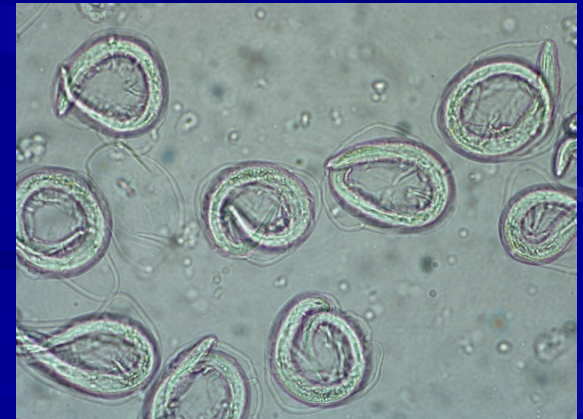


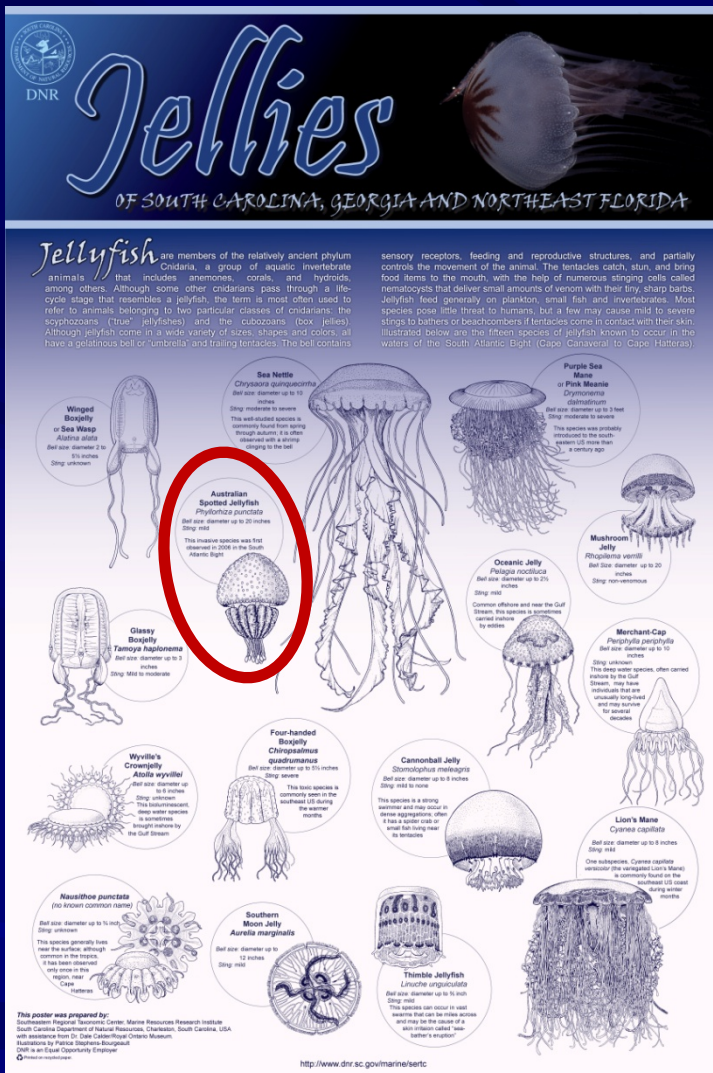
# *Anguillicoloides crassus*

- reported prevalence of 52% NC; 10-29% Chesapeake Bay; >80% NJ
- in SC, estimated at >50% in N. Edisto River
- found in necropsied indivs at SC Aquarium: source was NC baitshop
- SG proposal to look at life history and effects on transport hosts (copepods, other crustaceans, snails, fish) not funded



Sokolowski & Dove( 2006) Histopathology of infected wild American eels





# Phyllorhiza punctata

none seen in SC in 2008



SERTC poster: 2000 in print

# **SC Aquatic Nuisance Species Program**

**2008**

**Aquatic Plant Management Control  
Operations Review**

**Chris Page, Michael Hook, Walt Meitzen  
SC Department of Natural Resources**

# Old Friends

## Santee Coastal Reserve:

400 acres *Phragmites* in 2008

714 acres *Phragmites* in 2007

1,340 acres *Phragmites* in 2006

## *Phragmites* Totals:

748.25 treated in 2008

1,737.5 treated in 2007

1,950 treated in 2006



Significant headway has been made. Sufficient progress by helicopter application allows spot control by air boats to sustain control in some areas. But, it requires yearly diligence and constant control efforts to prevent resurgence.

# New Challenges

## Lake Cunningham

City of Greer

Commission of Public Works

32 acres Elodea

3 acres of Water Lily

## Boyd Pond

Aiken County Parks, Recreation  
and Tourism Department

12 acres Watermilfoil

0.5 acres Water Primrose

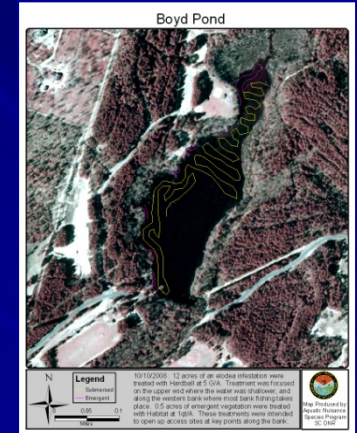
## Microcystis

Hopeland Gardens

Aiken, SC

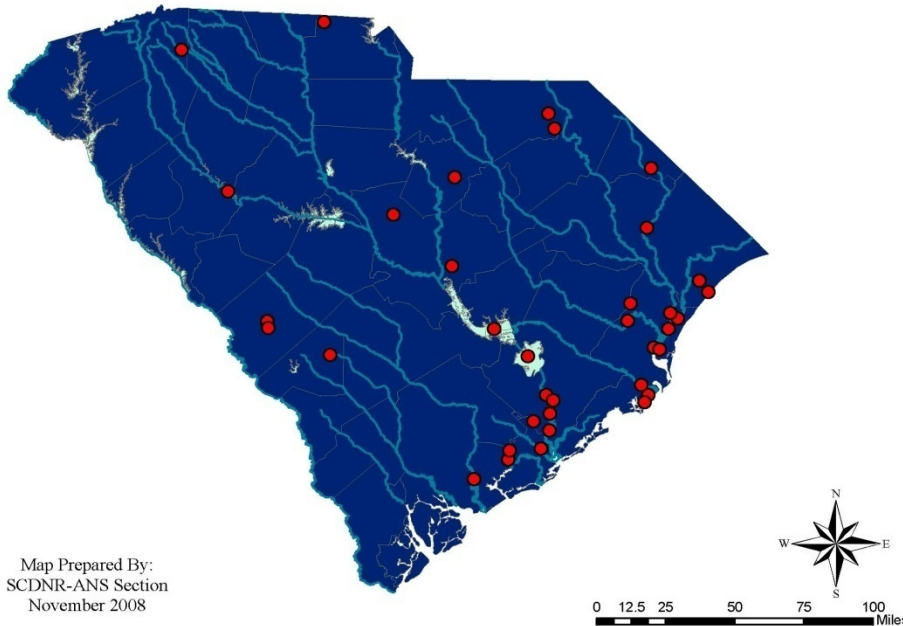
Microcystis

2 acre pond



# 2008 Species Totals

SC Aquatic Nuisance Species  
Control Operations 2008



Acres	Cost \$	Species
11.00	\$959.00	Alligatorweed
9.30	\$1344.60	Cabomba
49.00	\$1463.67	Duckweed
32.00	\$7472.64	Elodea
8.00	\$686.00	Frog's bit, loosestrife
<b>432.69</b>	<b>\$102,651.86</b>	<b>Hydrilla</b>
110.50	3670.50	Island apple snail
14.00	\$1060.50	Lotus
2.00	\$84.00(+645.00)	Microcystis
38.00	\$9059.68	Naiads
0.50	\$86.63	Pennywort
<b>741.50</b>	<b>\$106,303.26</b>	<b>Phragmites</b>
13.75	\$1609.85	Pithophora
6.00	\$1206.00	Spatterdock
<b>765.25</b>	<b>\$70,174.58</b>	<b>Water hyacinth</b>
75.00	\$7576.05	Water lettuce
20.00	\$3678.00	Water lily
12.00	\$2412.00	Water milfoil
40.50	\$3264.63	Water primrose
4.00	\$804.00	Watershield
20.00	\$2682.50	Willow
10.00	\$2010.00	Yellow cowlily

# 2008 Season Summary

## Grand Totals:

**3335.39 acres \$641,791.05**

## SCDNR Totals

**2378.24 acres \$338,655.23**

## Santee Cooper Totals

**920.40 acres \$295,431.06**

## SCPRT

**36.75 acres \$7,704.76**



# Control Operations Comparison: 2007 to 2008

	2007	2008	Difference
<b>SCDNR Acres</b>	<b>3298.38</b>	<b>2378.24</b>	<b>-920.14</b>
<b>Santee Cooper Acres</b>	<b>860.25</b>	<b>920.40</b>	<b>+60.15</b>
<b>SCPRT Acres</b>	<b>49.50</b>	<b>36.75</b>	<b>-12.75</b>
<b>Total Acres</b>	<b>4208.13</b>	<b>3335.39</b>	<b>-872.74</b>



# Control Operations Comparison: 2007 to 2008

	2007	2008	Difference
<b>SCDNR</b>	<b>\$539,770.48</b>	<b>\$338,655.23</b>	<b>-\$201,115.25</b>
<b>Santee Cooper</b>	<b>\$223,666.19</b>	<b>\$295,431.06</b>	<b>+\$71,764.87</b>
<b>SCPRT</b>	<b>\$9,826.53</b>	<b>\$7,704.76</b>	<b>-\$2,121.77</b>
<b>Total</b>	<b>\$773,263.20</b>	<b>\$641,791.05</b>	<b>-\$131,472.15</b>



**South Carolina  
Aquatic Invasive Species  
MANAGEMENT PLAN**



Prepared in coordination with the  
South Carolina Aquatic Invasive Species Task Force  
by the  
South Carolina Department of Natural Resources

September 2008

# **SC AIS Management Plan**

- **completed**
- **approved by state Work Group**
- **signed by Governor**
- **submitted to ANS Task Force for  
approval on 21 November**

*C. ariakensis* (Suminoe oyster) Draft PEIS out for public comment

Would GSARP comment on this PEIS?

Would GSARP consider contacting Northeast Regional Panel regarding this issue?