Overview of North Carolina's Hydrilla control efforts

GSARP

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Charleston, S.C.

Outline of this presentation

1. History of Hydrilla in NC
2. Lake Waccamaw project
3. Eno River project

History of Hydrilla in NC

1980 - 2005 (the first 25 years)

- Initial infestations (Wake County).
- Piedmont occurrences became more frequent (steady up-tick) but were somewhat sporadic.
  - Inter-basin spread (likely anthropogenic)
  - Lakes were managed with great success by stocking Grass Carp (Lake Wheeler, Lake Gaston*, Mt. Island Lake, Lake Norman, etc.).
- Mountains and Coastal Plain occurrences remained rare.

History of Hydrilla in NC

(1980 - 2005) 2005 - 2008 (2008 - 2010) (2010 - 2012)

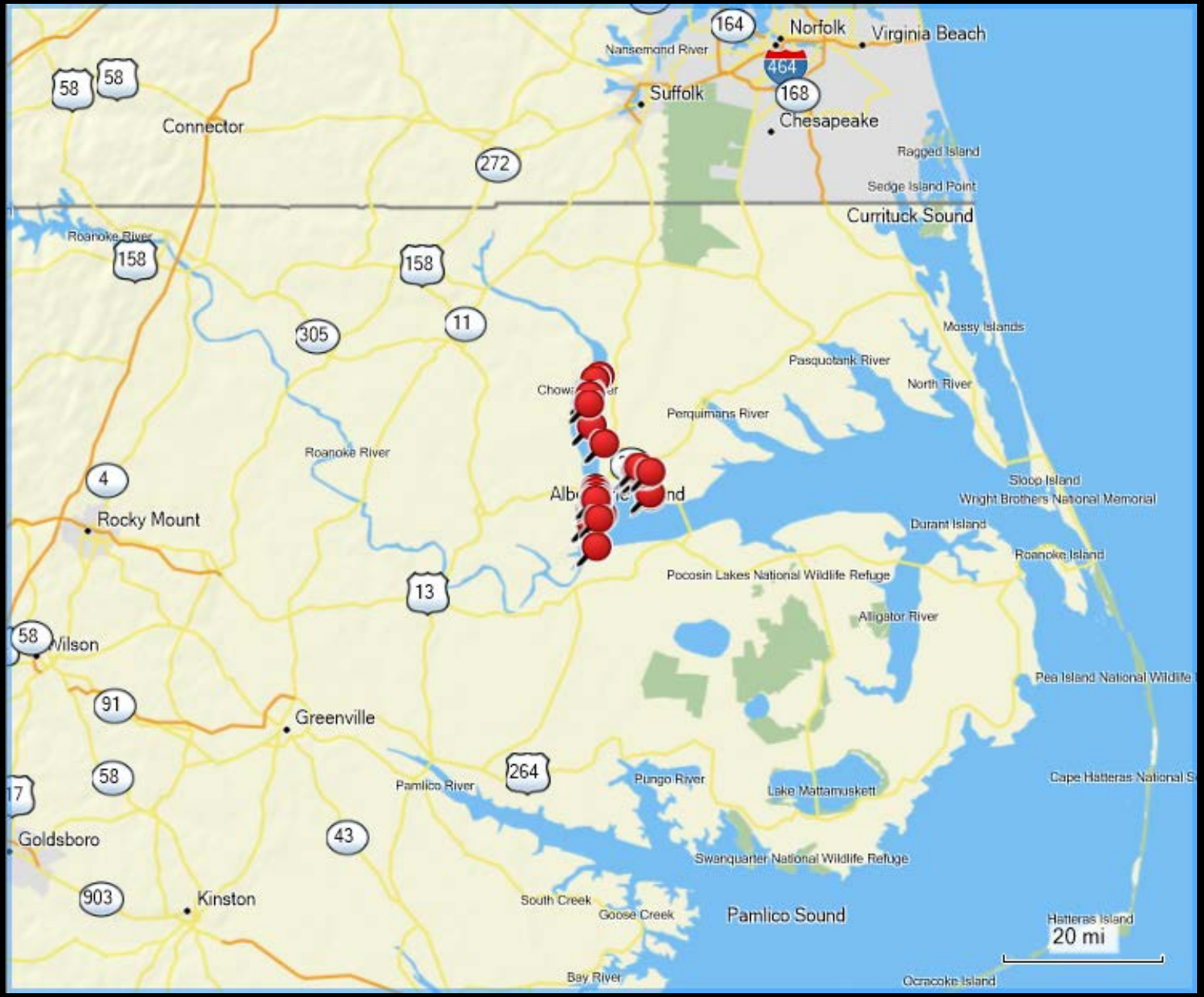
- Hydrilla began to infest the Eno River.
  - Flowing waters (not impoundments)
- Hydrilla began infesting impoundments in the Coastal Plain.

Obtaining permits to release grass carp at these sites was difficult

History of Hydrilla in NC

(1980 - 2005) (2005 - 2008) 2008 - 2010 (2010 - 2012)

- Hydrilla began infesting open waters in the upper Albemarle Sound.
  - Roanoke River
  - Chowan River
  - Batchelor Bay
  - Salmon Creek
  - Queen Anne Creek & Filberts Creek (Edenton)


Norfolk
Virginia Beach
Nansemond River
Suffolk
Chesapeake
Ragged Island
Sedge Island Point
Currituck Sound
Connector
Roanoke River
Massy Islands
Pasquotank River
North River
Perquimans River
Roanoke River
Sloop Island
Wright Brothers National Memorial
Durant Island
Roanoke Island
Rocky Mount
Pocosin Lakes National Wildlife Refuge
Alligator River
Wilson
Pea Island National Wildlife
Greenville
Pamlico River
Pungo River
Lake Mattamuskeet
Cape Hatteras National S
Goldsboro
Swanquarter National Wildlife Refuge
Kinston
South Creek
Goose Creek
Pamlico Sound
Hatteras Island
20 mi
Bay River
Ocracoke Island
164
464
168
58
272
158
11
305
4
13
91
264
43
903
17

History of Hydrilla in NC

(1980 - 2005) (2005 - 2008) (2008 - 2010) 2010 - 2012

– Hydrilla began to infest Lake Waccamaw.
  - Carolina Bay (a natural lake, ~9,000 acres)
  - Classified as “Outstanding Water Resource”
  - Endemic species
  - Shallow lake (deepest part is 8’ – 9’)
  - Hydrilla occupied ~600 acres by end of 2012

Lake Waccamaw Hydrilla project

A great example of the Power of Partnerships

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The project that catapulted the Aquatic Weeds Program into the legislative spotlight

Lake Waccamaw Hydrilla project

- Town of Lake Waccamaw
- Columbus County
- NC Dept. of Agriculture
- NC Div. of Parks & Recreation
- NC Div. of Water Quality
- NC Div. of Water Resources
- NC Natural Heritage Program
- NC Wildlife Resources Commission
- US Fish & Wildlife Service
- North Carolina State University
- Univ. of North Carolina – Wilmington
- The Nature Conservancy
- Winyah Rivers Foundation
- Invasive Plant Control, Inc.
- SePRO Corporation

Lake Waccamaw Hydrilla project

So what did all of these partners do

Lake Waccamaw Hydrilla project

Technical Expertise

- Academia
- Government Agencies
- NGOs
- Industry

Lake Waccamaw Hydrilla project

Funding

- Local Governments
- State Agencies

Lake Waccamaw Hydrilla project

Monitoring services

- State Agencies
- Academia

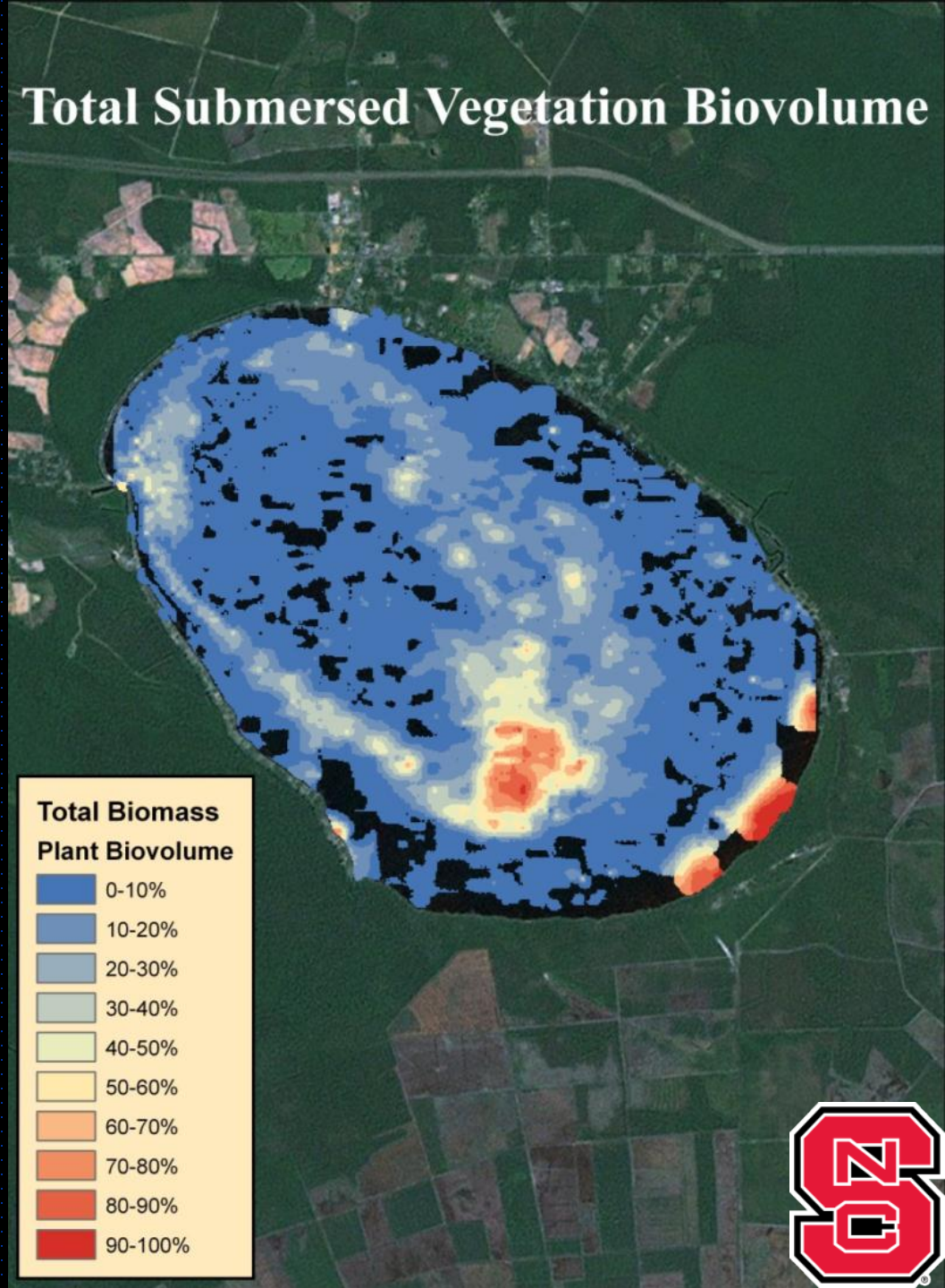

Point Intercept Survey Points


SEAARK
LOWRANCE
SEAARK

Plant biovolume across the 9,000 acre lake

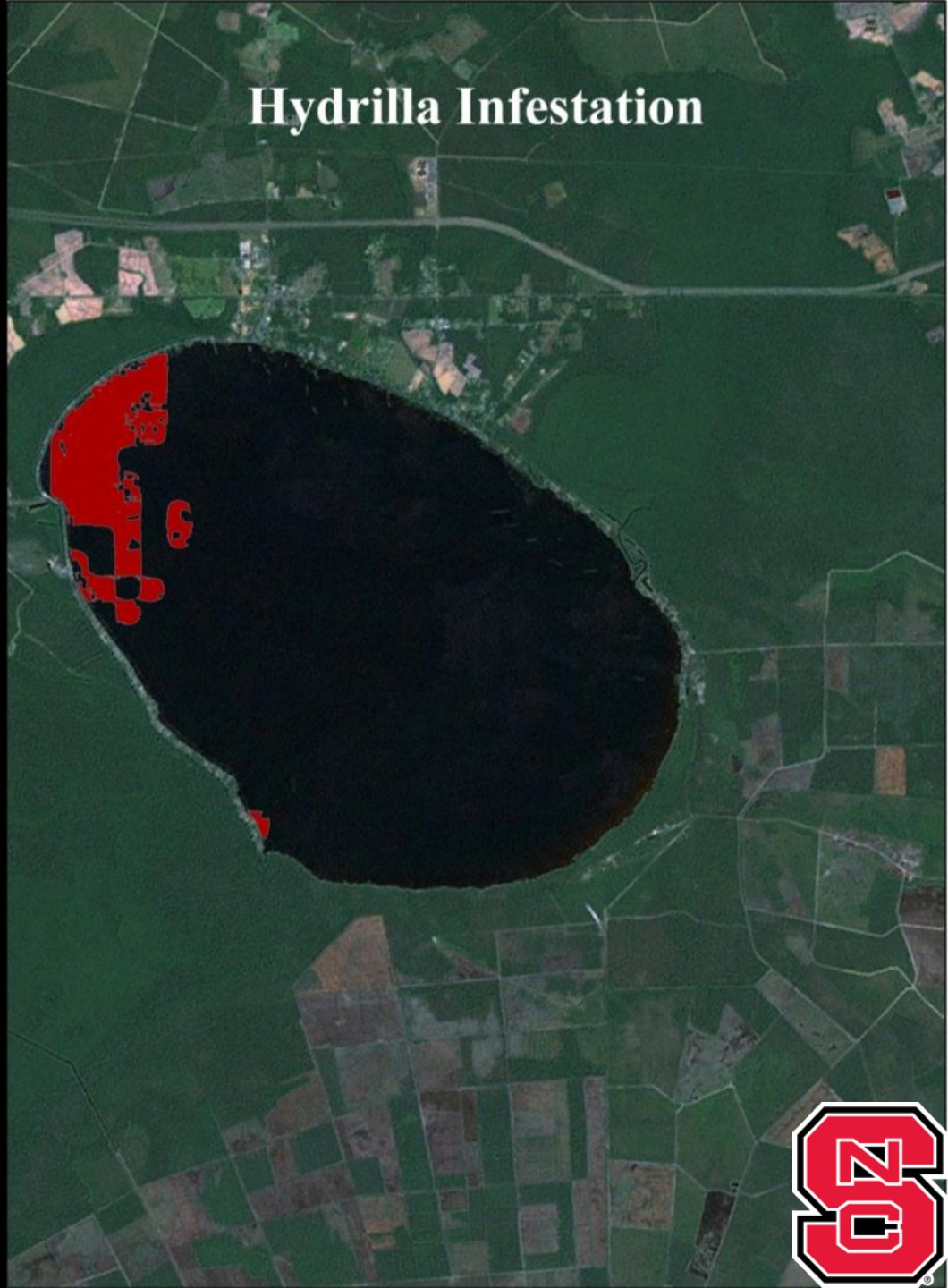
Derived from SONAR data

2012



Survey estimated 608 acres

Hydrilla



Lake Waccamaw Hydrilla project

Year	Activity	Cost
2012	Lake-wide vegetation survey	$5,000
2013	Research + Herbicide + contract oversight + vegetation survey	$415,000
2014	Herbicide + contract oversight + vegetation survey	$375,000
2015	Herbicide + contract oversight + vegetation survey	$470,000
2016	Herbicide + contract oversight + vegetation survey	$465,000
2017	Herbicide + contract oversight + vegetation survey + tuber survey	$468,000
2018	Herbicide + contract oversight + monitoring + vegetation survey	$410,000
2019	Herbicide + contract oversight + monitoring + vegetation survey	$424,000

Lake Waccamaw Hydrilla project

Success story

- Celebrate fact that we hit our goal (7 years of treatment)
- The tuber bank should be exhausted

Lake Waccamaw Hydrilla project

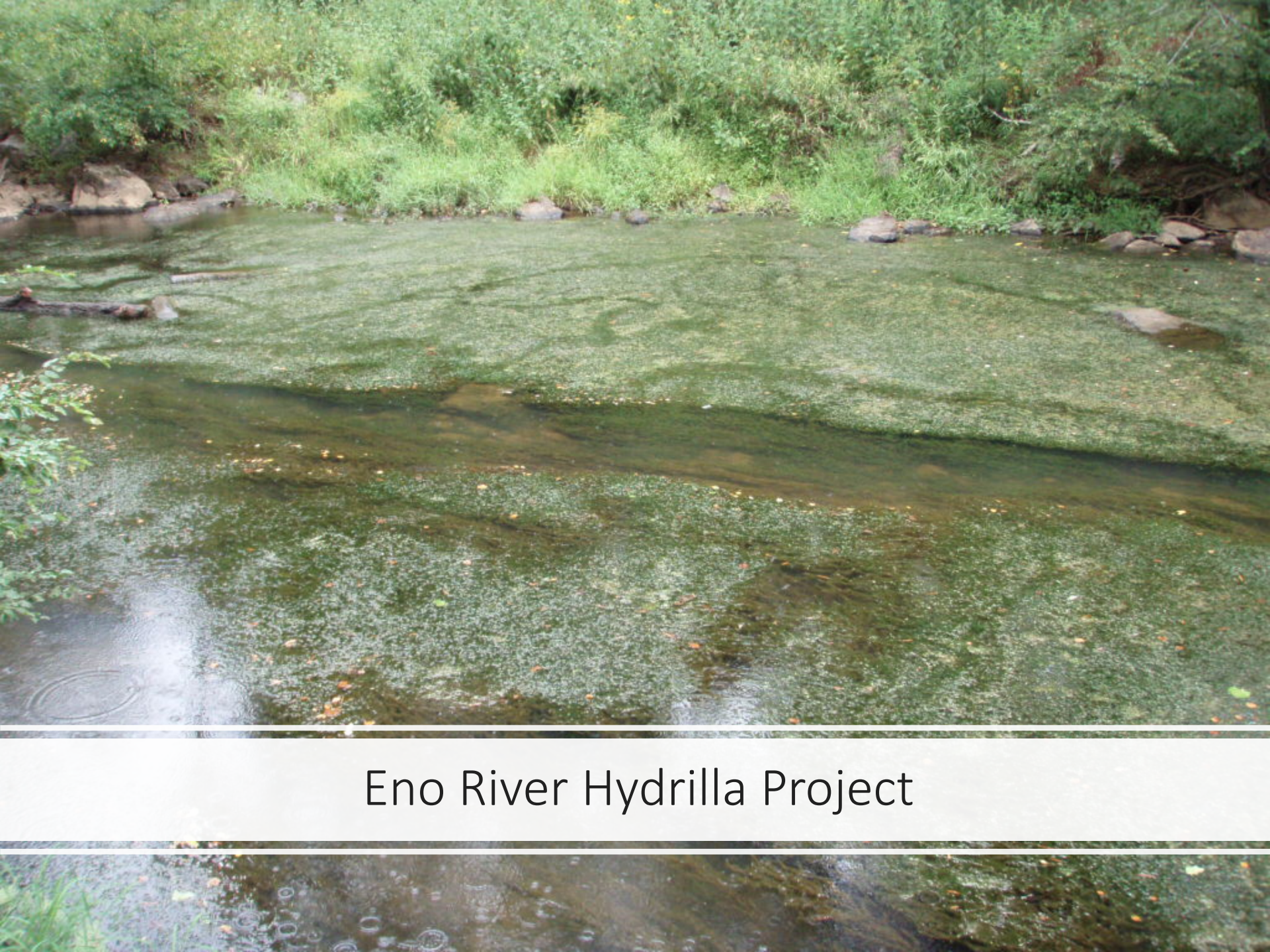
What now.....

Continue to monitor area where Hydrilla was, sure, but what efforts should be taken to address/mitigate the risk of reintroduction of Hydrilla (or another ANS)

The BIG question that goes beyond the Lake Waccamaw project

How to step up prevention

- What approach does NC want to take....
  - Public Education
  - ~~Tougher laws / Enforcement~~
  - Boat/equipment inspection program
  - Boat/equipment cleaning stations
- What agency would be responsible
- Funding



Eno River Hydrilla Project

Eno River Hydrilla project

A great example of the Power of Partnerships

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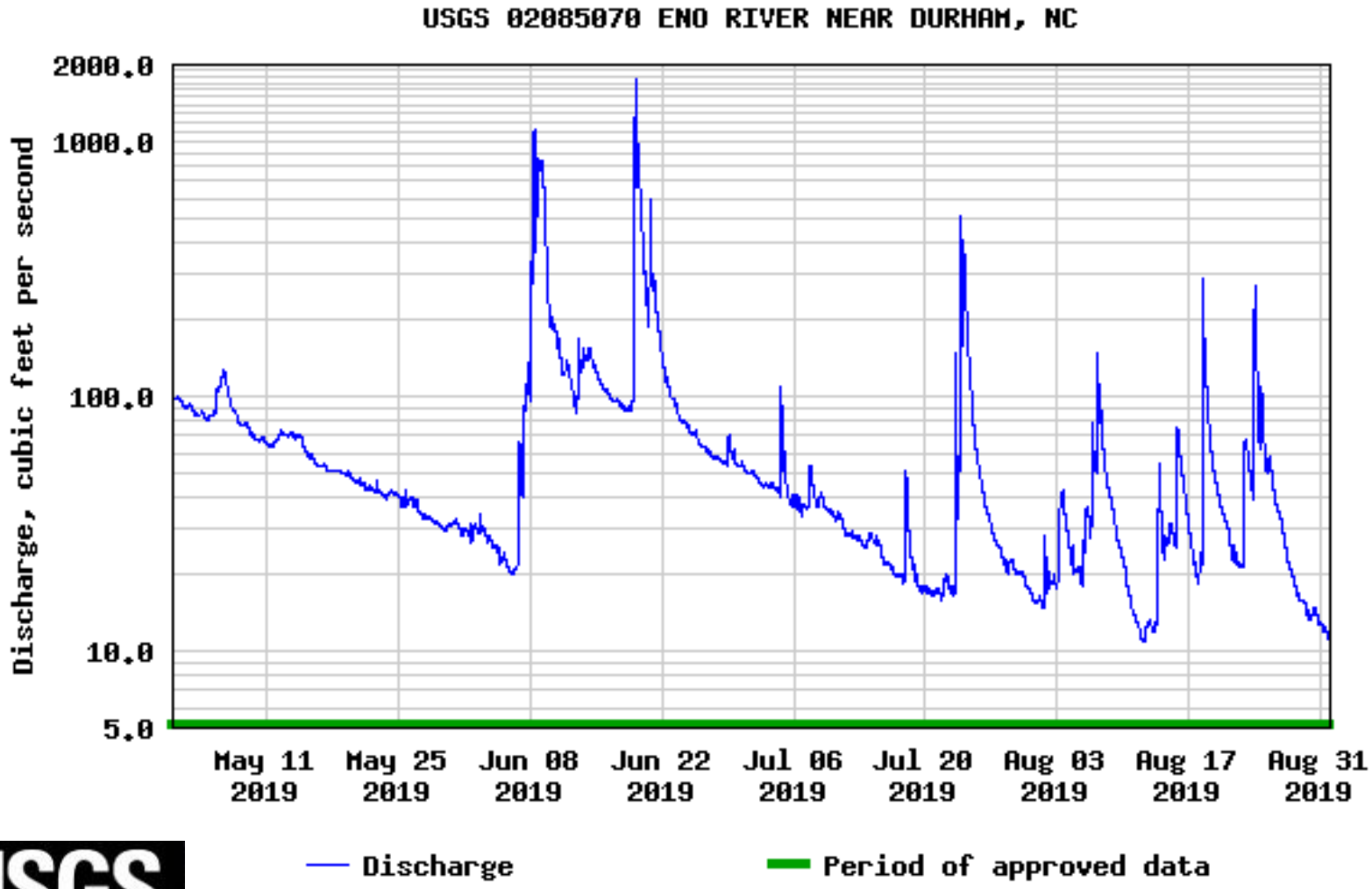
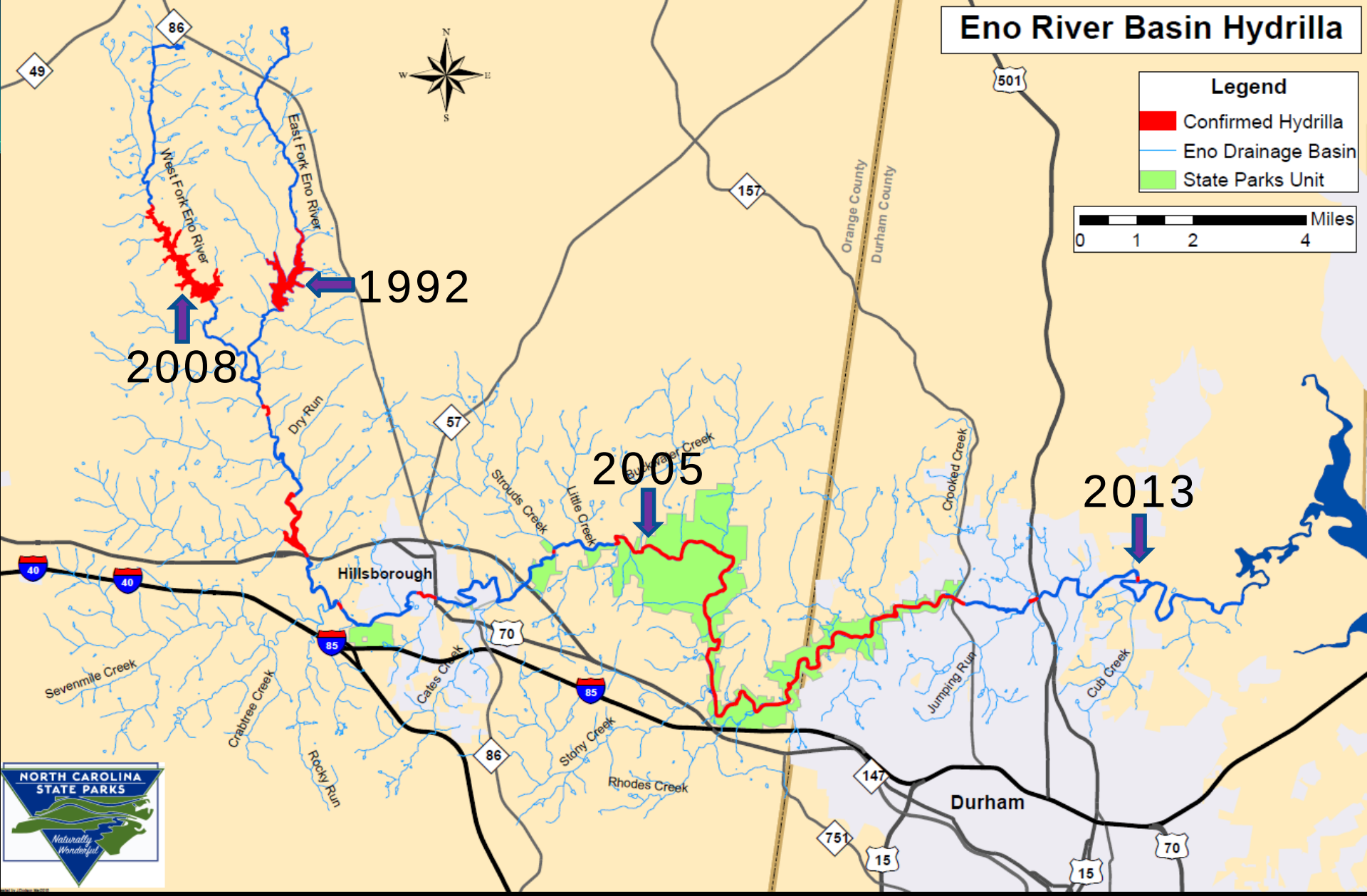
First time NC's Aquatic Weeds Program managed Hydrilla in a lotic system

(historically, projects were solely lakes/ponds)

Eno River flow rate from 5/1/19 – 8/31/19



USGS science for a changing world


Eno River Basin Hydrilla
Legend
Confirmed Hydrilla
Eno Drainage Basin
State Parks Unit
Miles
0 1 2 4
1992
2005
2013
2008
West Fork Eno River
East Fork Eno River
Dry Run
Strouds Creek
Little Creek
Crooked Creek
Jumping Run
Cub Creek
Cates Creek
Stony Creek
Rhodes Creek
Rocky Run
Crabtree Creek
Sevenmile Creek
Orange County
Durham County
Hillsborough
Durham
NORTH CAROLINA STATE PARKS
Naturally Wonderful

2009 - 2012 Informal surveys of river suggested a downstream spread at the rate of ½ to 1 mile per year.

2013 - 2014 Formal surveys of river identified all sections with Hydrilla

Eno River Hydrilla project

Partnership: Eno River Hydrilla Management Task Force

- Town of Hillsborough
- City of Durham
- City of Raleigh
- Durham County
- Orange County
- NC Dept. of Agriculture & Consumer Services
- NC Dept. of Health and Human Services
- NC Division of Parks & Recreation
- NC Division of Water Resources
- NC Natural Heritage Program
- NC State University
- NC Wildlife Resources Commission
- US Army Corps of Engineers
- US Fish & Wildlife Service
- Triangle Fly Fishers
- Eno River Association

Eno River Hydrilla project

Partnership: Eno River Hydrilla Management Task Force

Meetings (approx. 4 per year)

- Define objective
  - Bring to below nuisance level
- Make recommendations
  - Communications
  - Management details

Power of Partnerships

- Eno River Association and Eno River State Park
  - Organized a volunteer day
  - Hand-pulling was focused to specific site
  - Plants were collected in bags

Eno River
2011

Volunteers hand-pulling Hydrilla.

Power of Partnerships

- NC Wildlife Resources Commission
  - Grass carp tagging study
- NCSU - Toxicology
  - Panhandle Pebble Snail (LD_{50}, reproduction, etc.)
- NCSU - Crop Science
  - Herbicide trials to determine sensitivity of Riffle Weed to fluridone and endothall
- NC DHHS - Division of Public Health
  - Public Health Evaluations for Potential Exposures to Fluridone or Endothall if used in the Eno River

Power of Partnerships

- NC DEQ - Division of Water Resources
  - Actions needed to meet SEPA requirements
    - Lead drafting of Environmental Assessment, recruited other partners to assist
  - Manage contracting process
  - Develop a Cooperative Agreement to define funding partner commitments

- SePRO
  - Obtain a “Special Local Needs” (24c) label addendum for Sonar Genesis

Power of Partnerships

It was critical to have a robust communications component.

Eno River is heavily used for:

- Recreation
- municipal water

Many partners participates directly or indirectly with:

- Open House
- Press releases
- Focused mailings to property owners adjacent to river
- Website
- Signage for river and for injection system

Herbicide treatment

2015

Eno River Hydrilla project

Herbicide treatments: 2015 - 2019

Success !!!

Hydrilla growth has been fully suppressed.

- No vegetative growth was observed in treated section

The Task Force has not yet recommended activities for 2020

North Carolina
Aquatic Weed Control Program

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Aquatic Weed Control Program

- NC Dept. of Environmental Quality
  - Division of Water Resources
- Established in early 1980's
  - State response to Hydrilla found in several lakes in Raleigh area (Wake County)
- Provides financial assistance to local governments and public utilities
  - Cost-share is required (1:1 non-state dollar match)