Aquatic Weed Identification

Gray Turnage, PhD

Mississippi State University

Cooperative Extension Service & Geosystems Research Institute

Gturnage@gri.misstate.edu

www.gri.misstate.edu

Nonindigenous vs. Native Community

Alternanthera philoxeroides
Alligatorweed

Nelumbo lutea
American lotus

Benefits of Native Aquatic Plants

- Benefits:
  - Stabilize lakes sediments reducing resuspension
  - Increase sedimentation reducing turbidity
  - Provide habitat for insects and forage fish
  - Habitat for fish spawning and YOY fish
  - Provide food for waterfowl and other animals

Human Use Impacts of Nonindigenous Plants

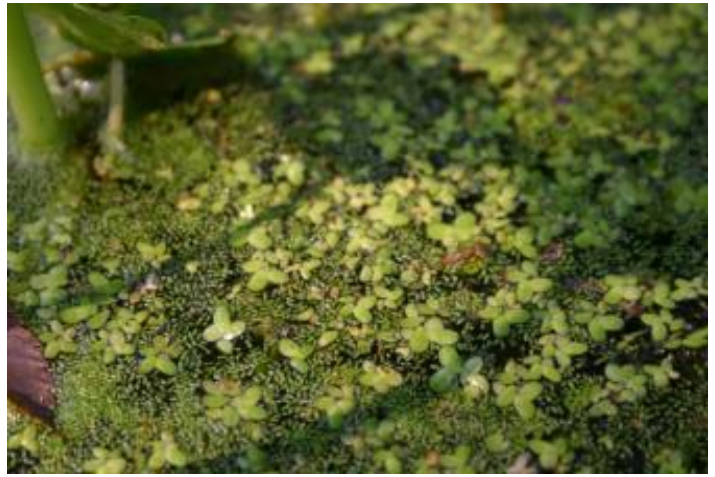
- Commercial Navigation
  - 6.5M rail cars or 25M semi-trucks
- Hydropower & Flood Control
  - Can cost millions due to shutdowns
- Insect Borne Disease
  - Plants provide breeding habitat
- Recreational Impairment
  - $16B income on ACOE lakes alone
- Property Value
  - Can decrease by as much as 40%

My Typical Extension Call:

- "Hey, Gray; I got some Grass in my Pond – How do I get rid of It?"
- My response: "What kind of Grass?"
- Answer: "Well, it's kind of Green."

When people say grass, I literally think of an aquatic grass like torpedograss *(Panicum repens)*

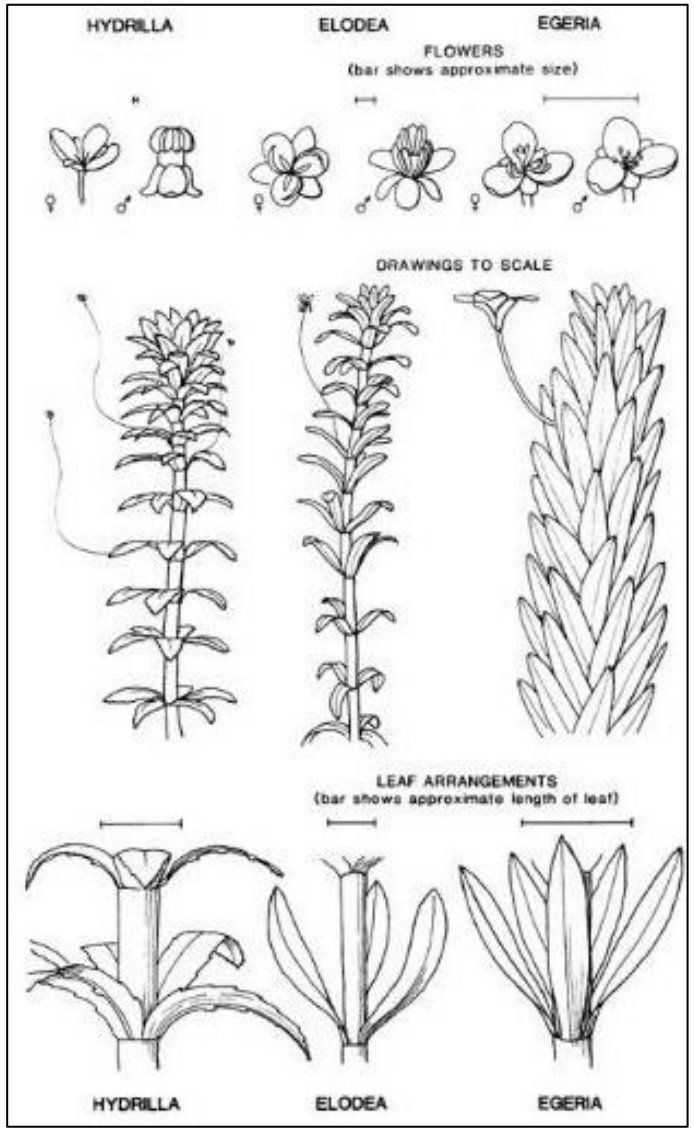
When you say grass, you could mean:



The Kind of “Grass” Matters:

- Proper identification is critical to selecting the correct herbicide
  - E.g., Endothall is good for egeria or hydrilla but poor for elodea….they are in the same family

- Proper identification will also indicate if there is an invasive problem or a localized native nuisance

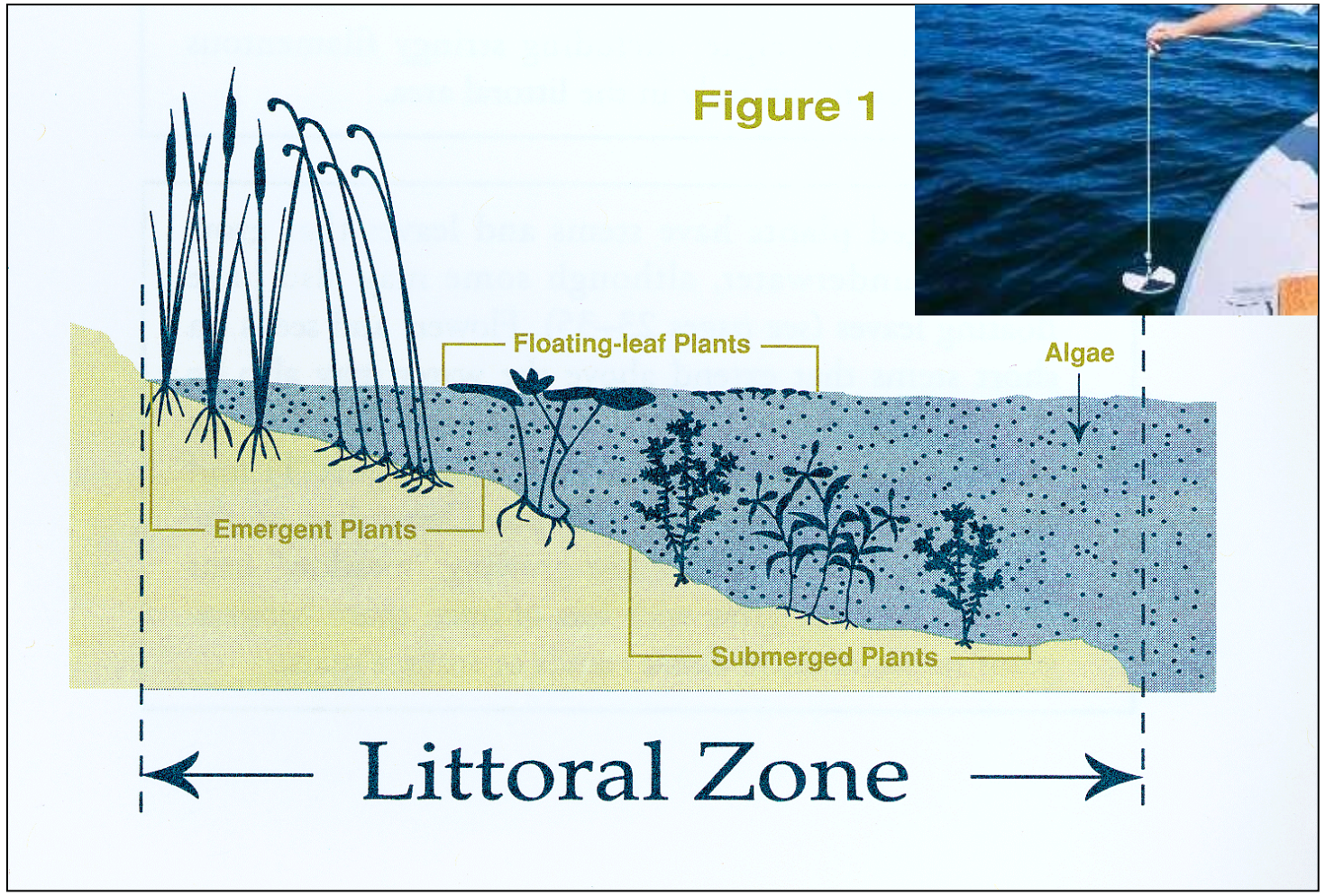


Growth Form:

- Growth form is key step in plant ID

- Littoral zone is that area of lakebed that receives enough sunlight for aquatic plants to grow

- Changes seasonally as water clarity changes
  - 3X Secchi Depth
  - Free-floating plants and algae not restricted to littoral zone



Getting a Good Plant ID:

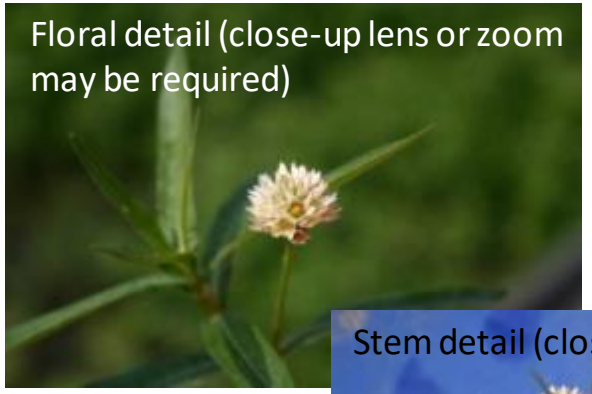
- This is first step in Management:
  - Publication Guides
  - Online Keys
- Experts - Send Photos or Live plant
- A number of people can identify aquatic plants in your region
  - Your Extension agent or specialist likely knows who they are

Applicator preparing to treat a storm water retention pond overgrown with water lettuce

Getting a Good Plant ID:

- Live Plant
  - Wrap in damp paper towel
  - Place in Ziploc bag
  - Ship on ice overnight to MSU

- Sending good quality digital photos are best way to get a good ID
  - Flower
  - Close-Up
  - Habitat

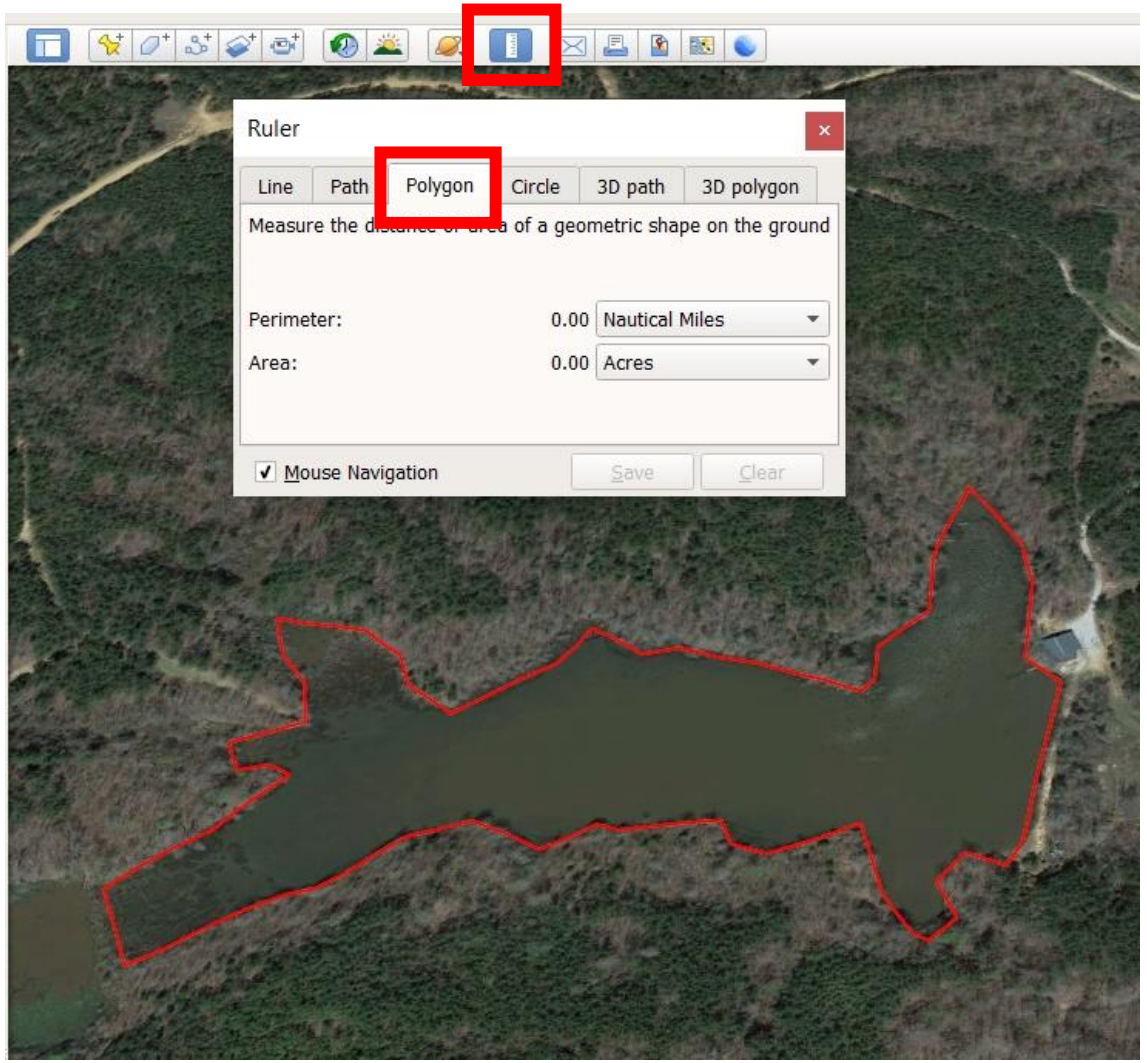


Good Habitat Shot:

Poor Habitat Shot:

How Big is Your Problem?

- For emergent and floating leaf plants, the AREA is the critical calculation needed (with a few exceptions)
- For submersed plants and algae, water VOLUME is the critical calculation needed (some exceptions)
- Software can help with this
  - Google Earth Pro

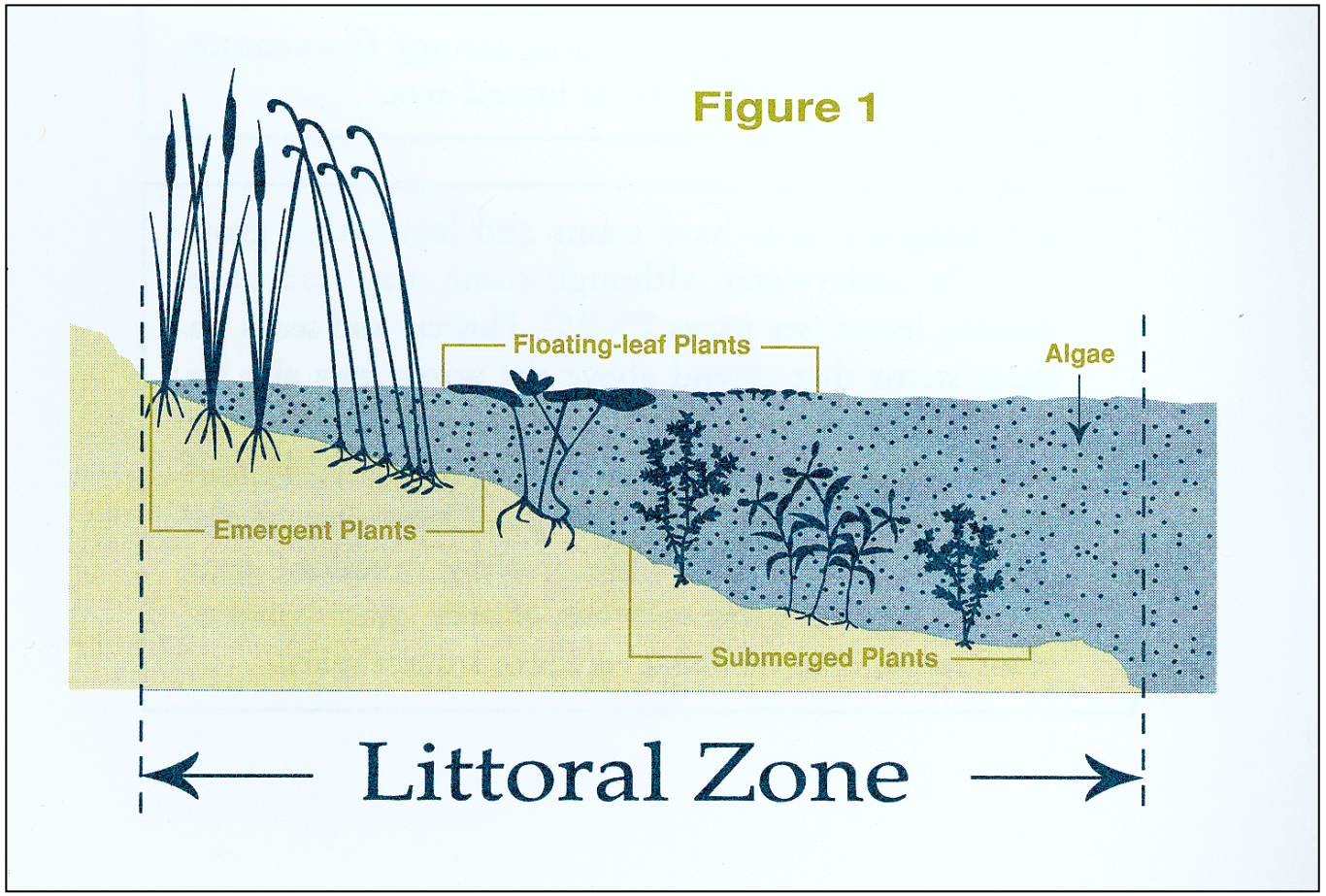


How Big is Your Problem?

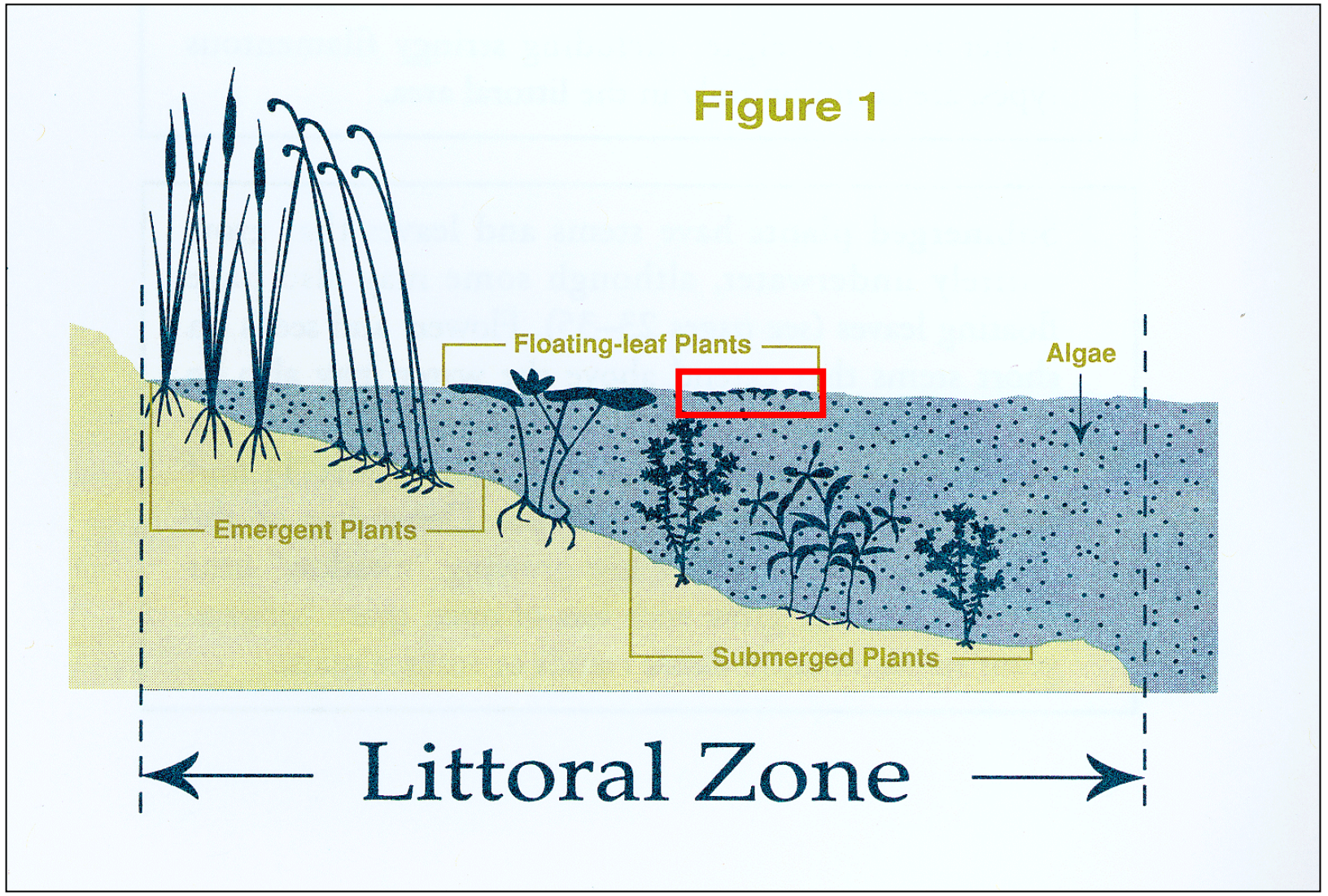
- Spend the time to take 20 or so depth soundings with a rod or sonar across the surface area of a pond
  - Or infested area
- Average these measurements for the avg depth
- Volume = area x avg. depth
  - Ac-ft.

AR Target Species

- Free-Floating:
  - Giant Salvinia, Cuban Bulrush, Water Hyacinth (Mature American Frogbit)
- Emergent/Floating Leaf:
  - Alligatorweed (Smartweed, Water Willow, Primrose), Yellow Floating Heart (Immature American Frogbit)
- Submersed:
  - Hydrilla (Elodea, Coontail), Egeria (Elodea, Naiads), Curlyleaf Pondweed



Free-Floating Plants



Giant Salvinia

- Giant salvinia (*Salvinia molesta* D.S. Mitchell)
  - Aquatic fern
- Neotropical, introduced weed in Africa, Australia, and US
- Resistant to drying and short freezing events
- Native to South America

Giant vs. Common Salvinia

S. molesta

S. minima

Cuban Bulrush

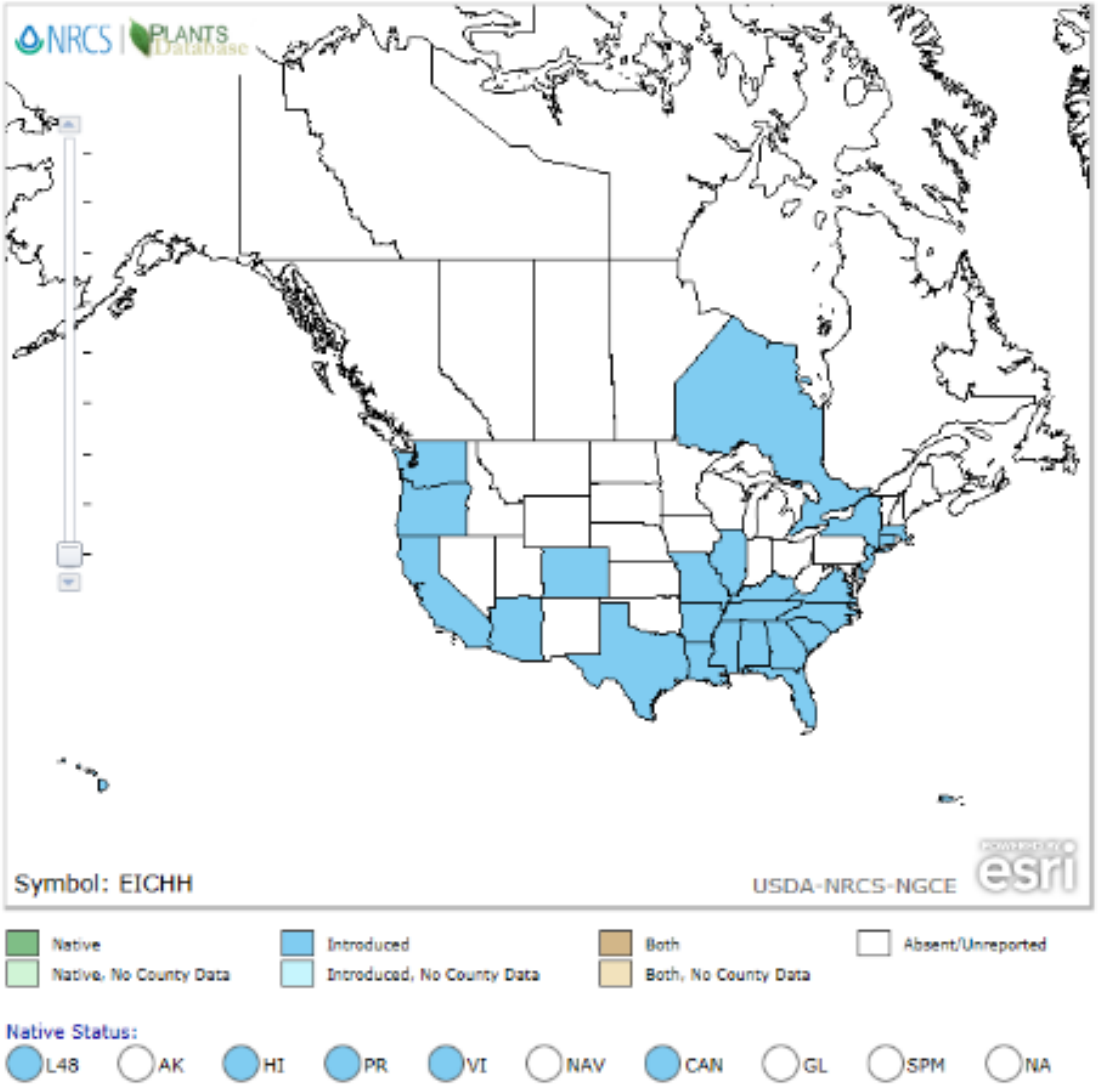
- Cuban Bulrush (*Oxycaryum cubense* (Poepp. & Kunth) Lye)
  - Native to south America
- 2 Biotypes in U.S.
  - Can reproduce sexually and vegetativley
- Forms floating mats of vegetation
  - 100's of acres in size
- Can survive colder temperatures than other spp.

Waterhyacinth

- Waterhyacinth (*Eichhornia crassipes* (Mart.) Solms)
  - Floating rosette with showy purple flower
- Vegetative reproduction from daughter plants on stolons; some reproduction from seed
- Native to Central and South America
- Worldwide #1 aquatic weed

Waterhyacinth

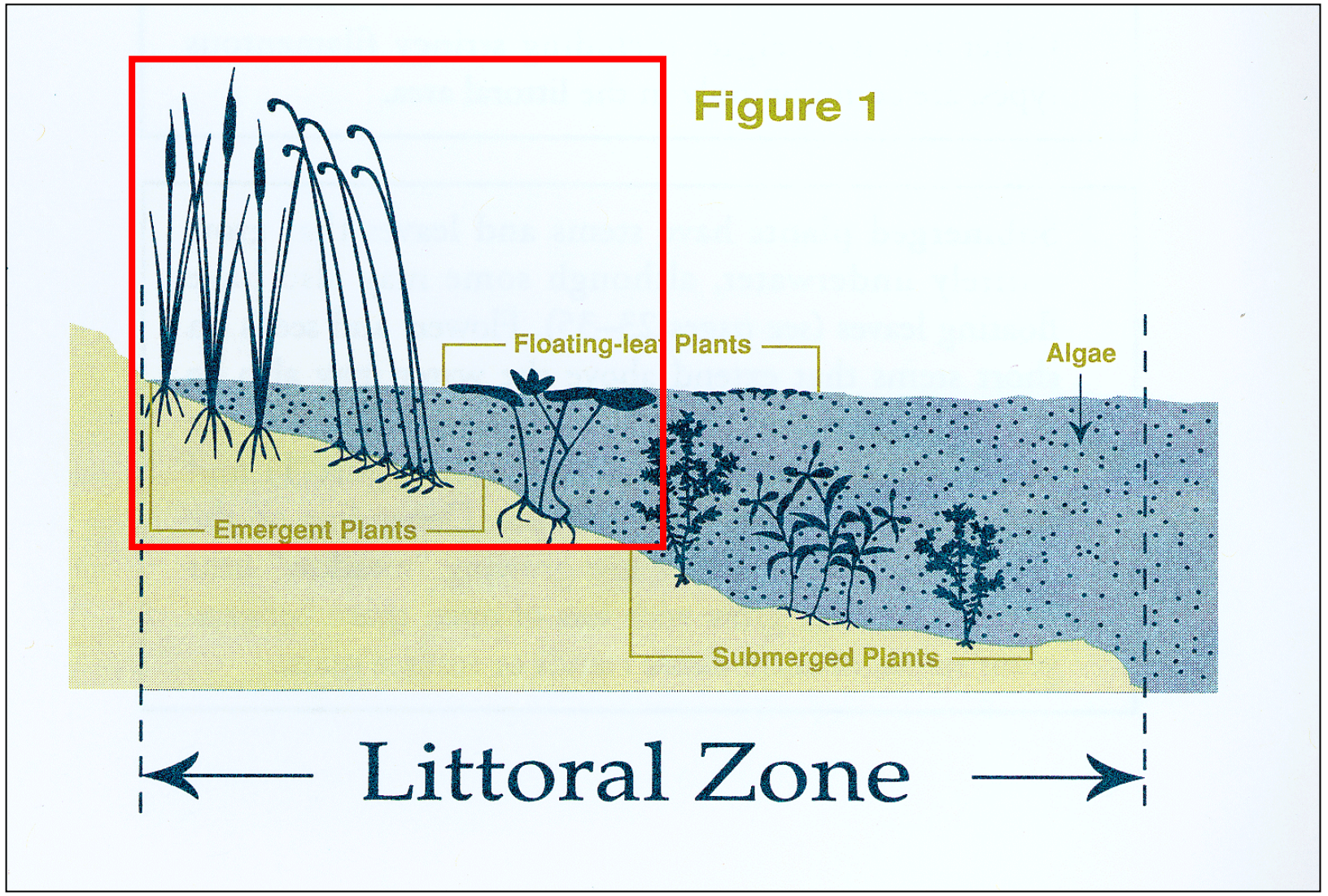
- Gulf and South Atlantic States, some Midwest and western states, Pacific states
  - 25 States + PR
- Largely under maintenance management in FL
- Commonly found with Cuban bulrush and/or Water lettuce



American Frogbit

- Starts off as a floating leaf plant
- Mature plants very similar to hyacinth
- Veins vs. striations
- Dense root material
- Small white flowers internal to foliage

Emergent/Floating Leaf Plants



Alligatorweed

- Alligatorweed (*Alternanthera philoxeroides* (Mart.) Griseb)
- Emersed/submersed perennial, leaves opposite and simple
- Rooted in shallow submersed or moist soil sites; usually forms floating mats
- Most common aquatic weed in MS

Water Primrose

- Water Primrose (*Ludwigia* spp.)
  - *L. hexapetala* (formerly *L. uruguayensis*)
  - *L. grandiflora*
  - *L. peploides*

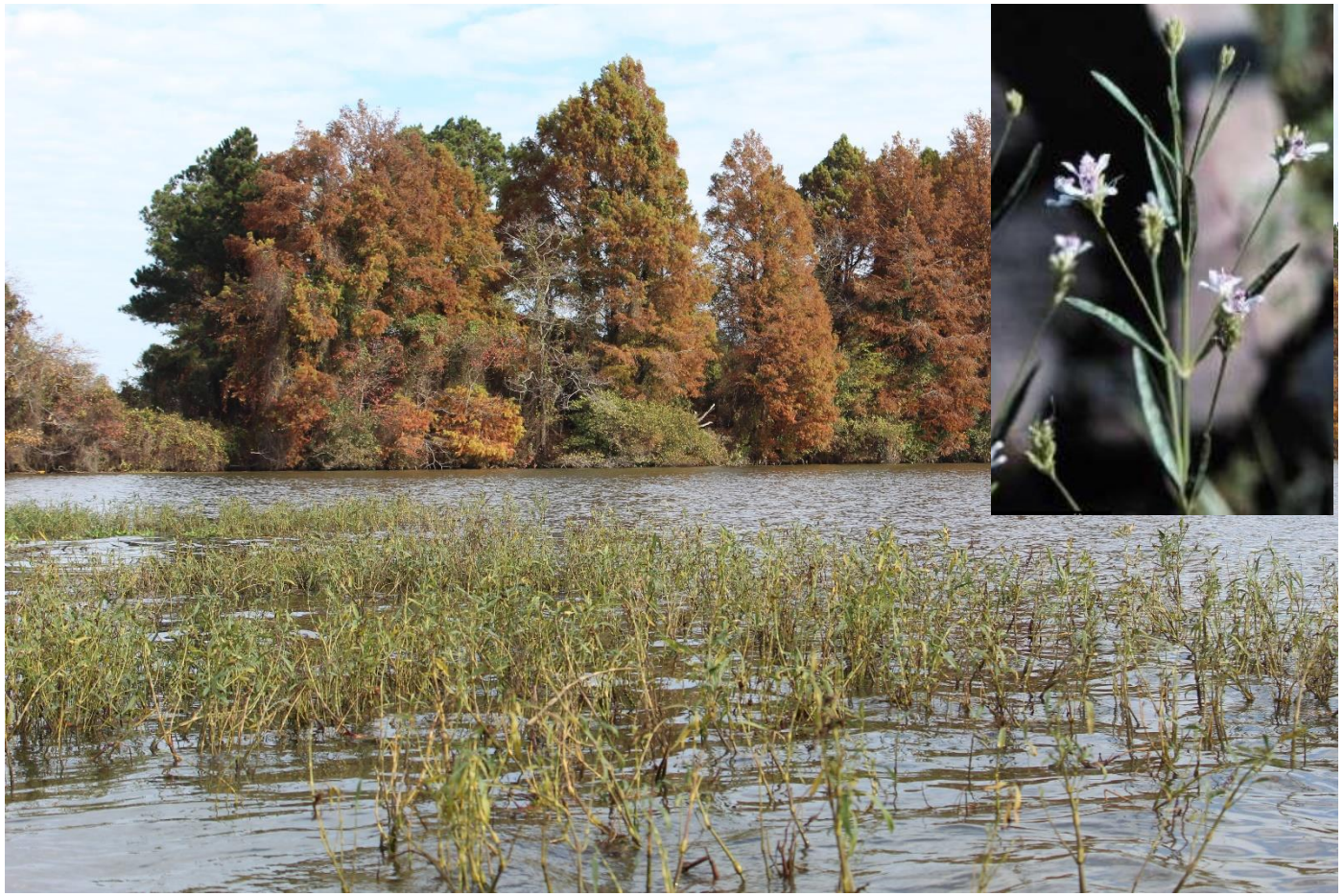
- Emergent or floating-stem herbaceous perennial

- Native of South America

- Very common MS nuisance in ponds and ditches

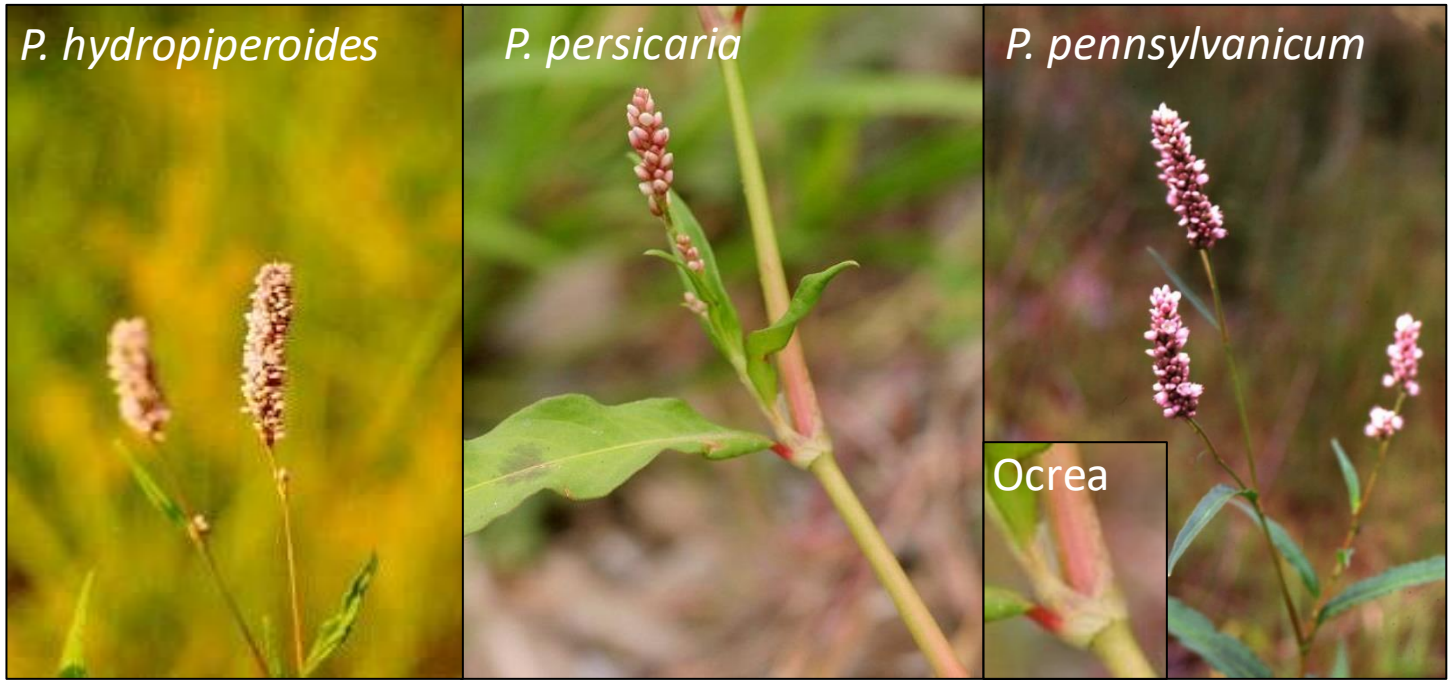
American Water Willow

- Water Willow (*Justicia americana* (L.) Vahl)
  - Native to U.S.
- Can form dense stands in shallow water
  - Commonly mistaken for allilgatorweed or primrose
  - Has a “dusty” appearance
- Beneficial fish habitat



Smart Weed

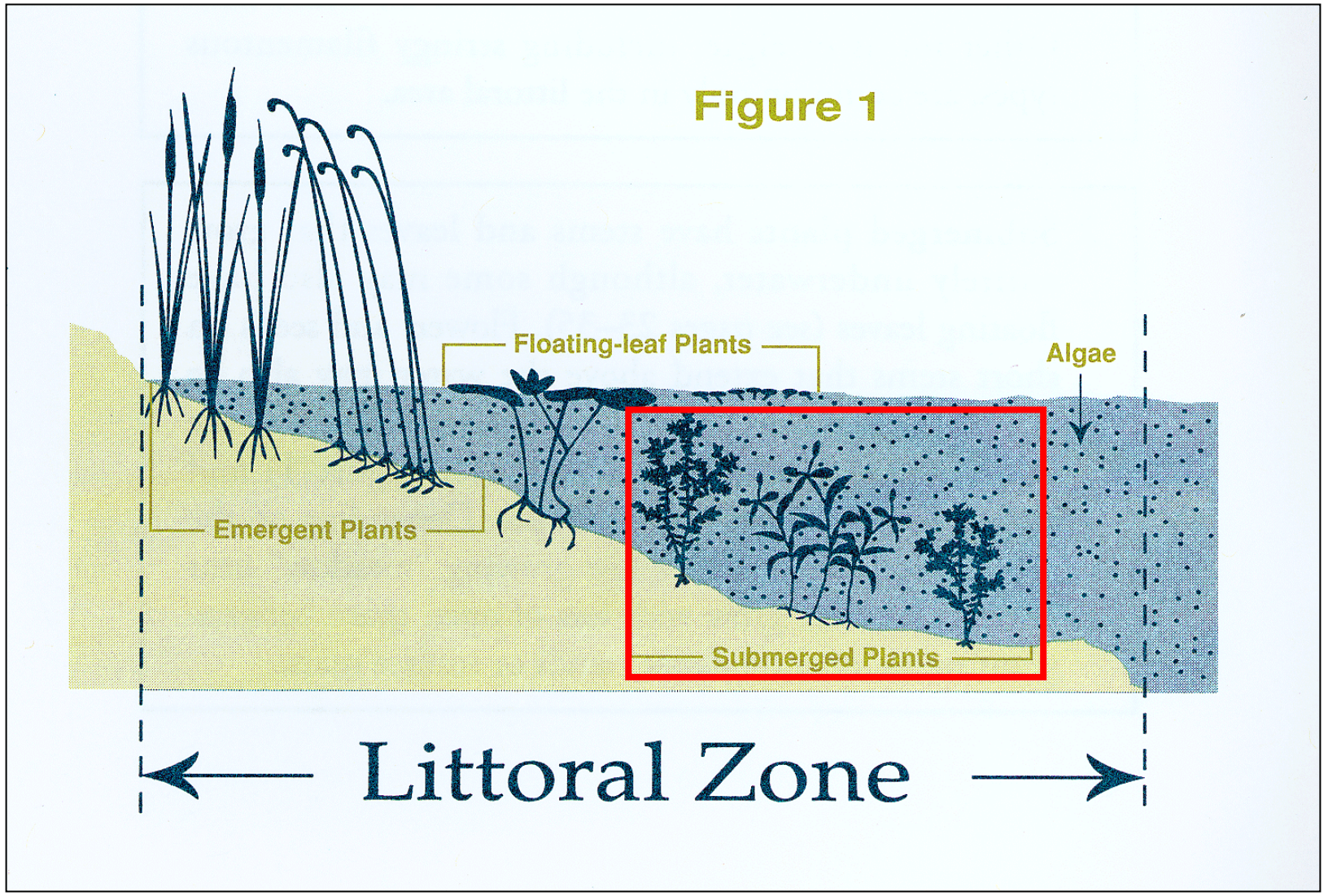
- Smart Weed (*Polygonum* spp.)
  - Native and invasives in U.S.
  - *P. hydropiper* vs. *hydropiperoides*
  - *P. pennsylvanicum*
  - *P. Persicaria*
- Found in shallow water of ditches and pond margins
- Ocrea is definitive structure to differentiate from other species



Yellow Floating Heart

- *Nymphoides peltata* (S.G. Gmel.) Kuntze
- Floating leaves
- Can reproduce sexually and vegetatively
  - Daughter plants
  - Rhizome fragmentation
- Easier to control than crested

Submersed Plants

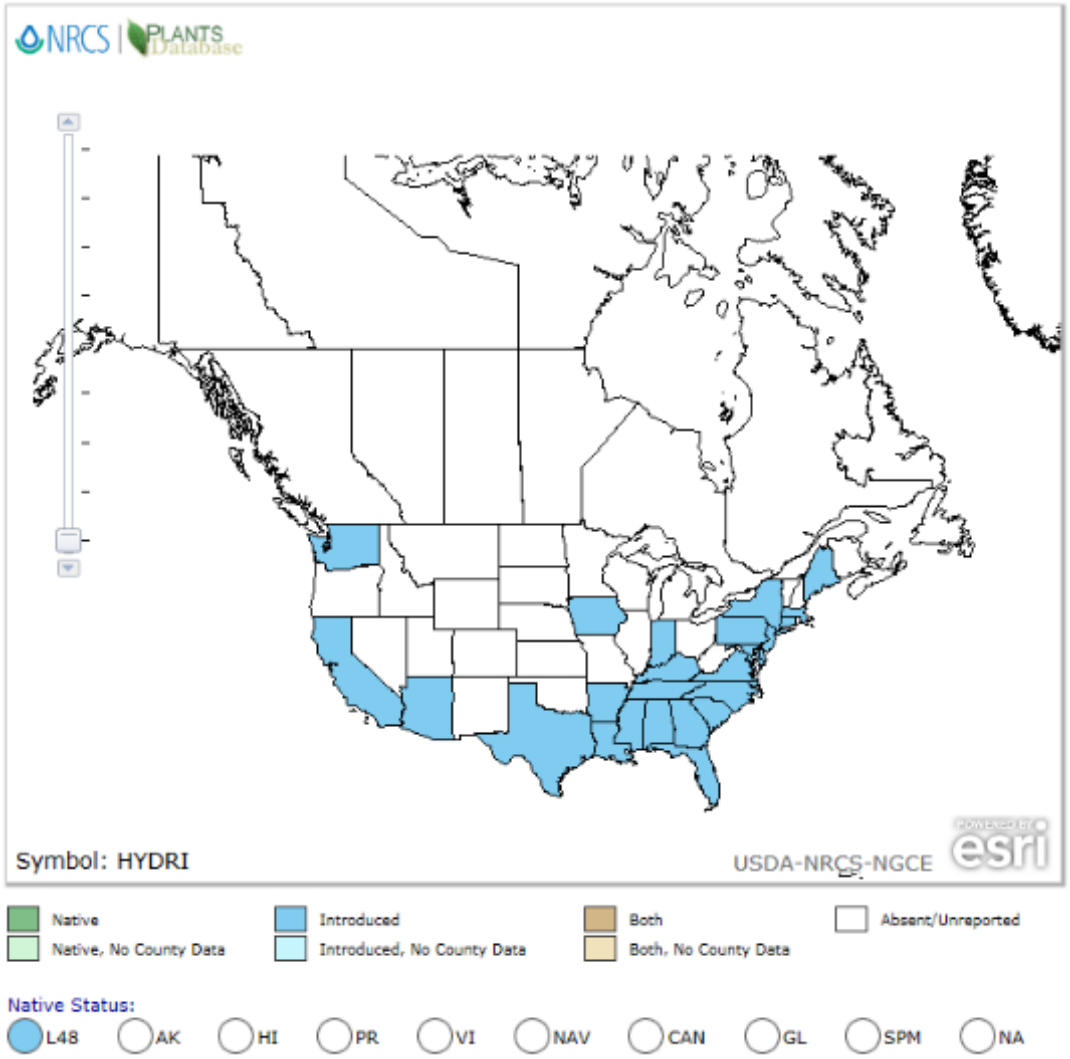


Hydrilla

- Hydrilla (*Hydrilla verticillata* (L.f.) Mich.)
  - Severe noxious plant in southern US, spreading northward
- Spreads by tuber, turion, and fragment
- Two biotypes found in US
- 3-8 leaves per node

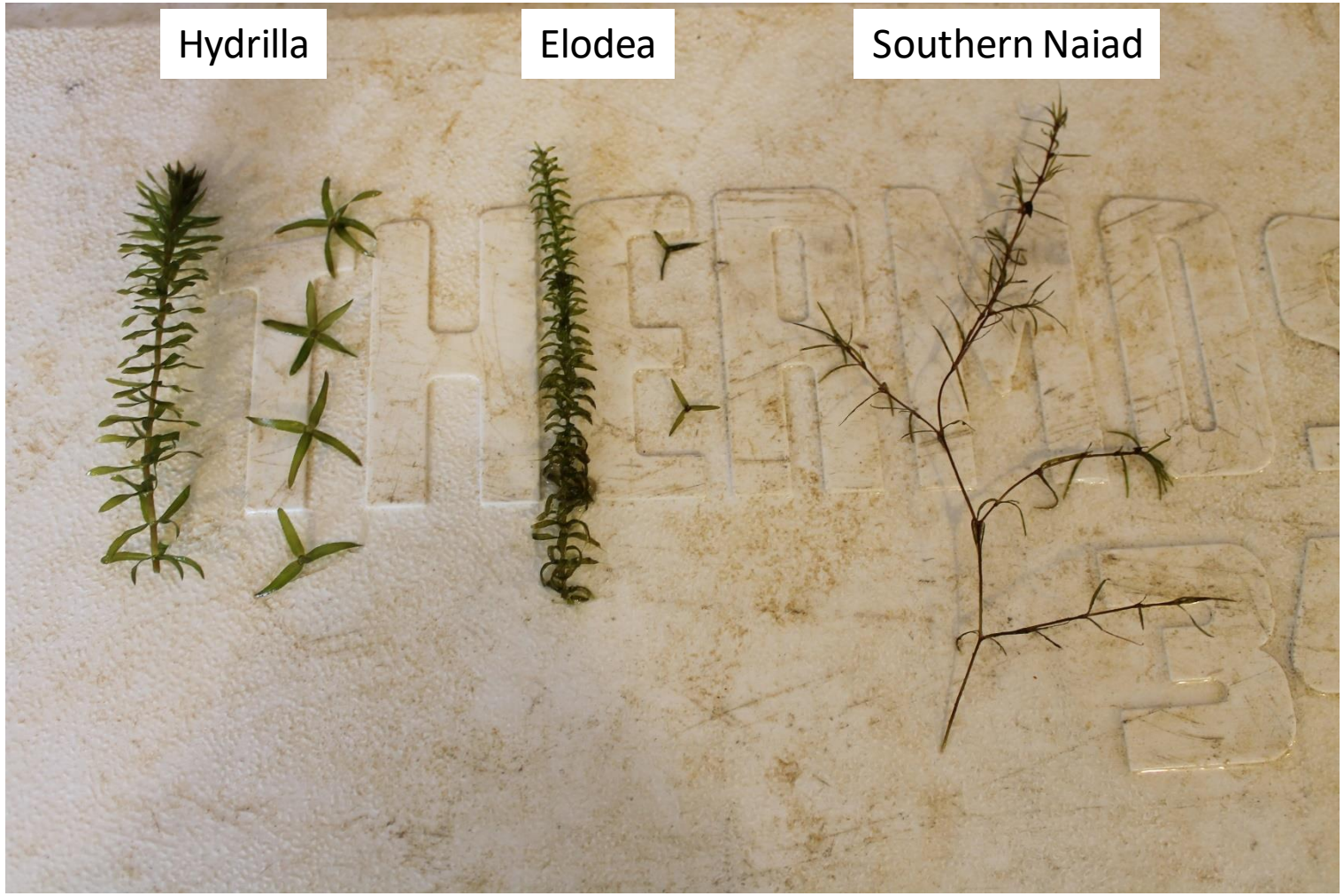
Hydrilla

- Dioecious biotype in southern areas (S CA, TX, LA, MS, AL, GA, FL, TN, NC
- Monoecious biotype in WA, N CA, VA, NC, DE, PA, NJ, CT, MA, ME, TN, AL
- CT River biotype in northeastern US



Elodea

- *Elodea canadensis*
- Native to lower 48 states
- 3 leaves per node (always)
- No midrib teeth under leaves
- Smaller stature than hydrilla



Eurasian watermilfoil

- *Myriophyllum spicatum*
- Invasive in U.S.
- 4 leaves per node/whorl
- Spreads by root crowns or runners
- Flat leaf ends, >12 leaflet pairs

Coontail

- Coontail (*Ceratophyllum demersum*) free-floating, unrooted submersed plant
- Very common native submersed plant
  - No true root structures
- Occasionally causes nuisance growth

Egeria

- *Egeria densa*
- Submersed plant that is non-native in U.S.
- Very dense foliage
- Similar appearance to hydrilla and elodea, more robust foliage


Photo Credit: J. Madsen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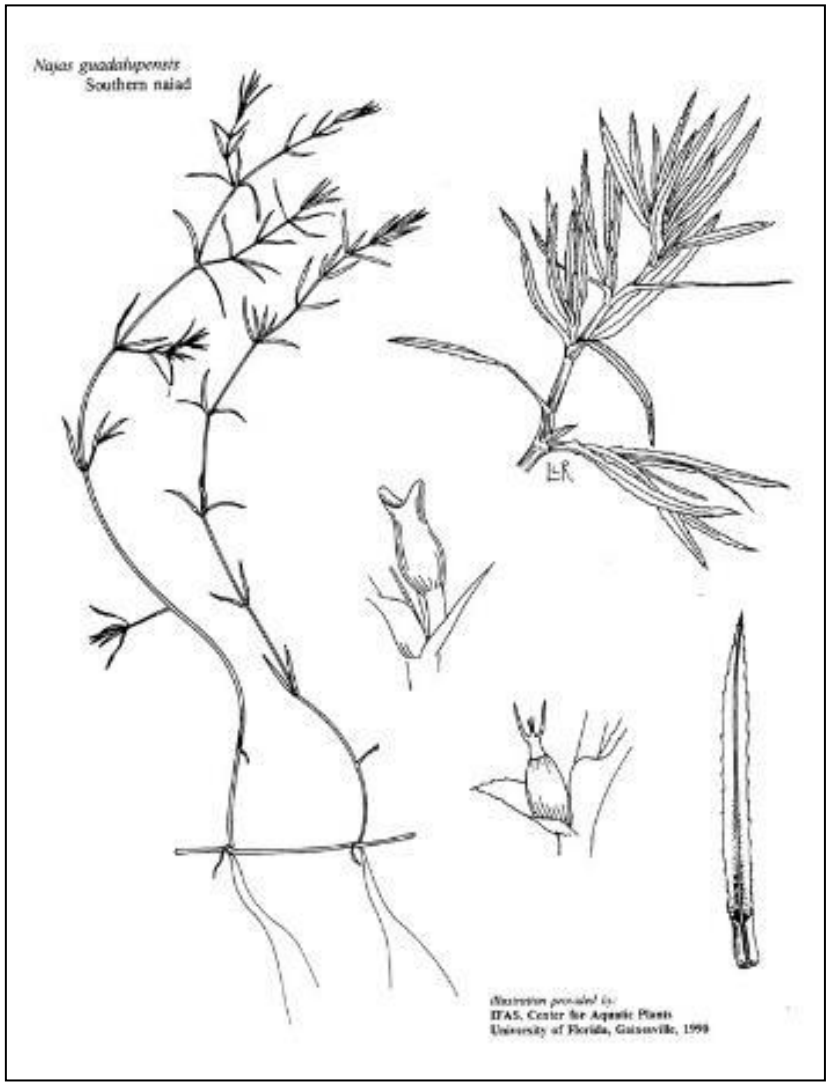
Southern Naiad

- *Najas guadalupensis* (Spreng) Magnus
- Native to U.S.
- Annual
- Responds after drawdown
- Very prevalent in small impoundments



Curlyleaf Pondweed

- *Potamogeton crispus*
- Invasive in U.S.
- Can reproduce vegetatively or sexually
  - Turions most common mode of reproduction and spread
  - 2 types of turions
- Problematic in colder months

Final Thoughts

- Correct plant ID is first step in solving problems
- Photos
  - Flower
  - Foliage and Stem
  - Habitat
- Growth Form
- Calculate size of infestation

Web Sites

- **FEDERAL GOVERNMENT**
  - Aquatic Plant Control Research Program
    - www.wes.army.mil/el/aqua/aqua.html
  - USDA Plants
    - www.plants.usda.gov
- **STATE GOVERNMENT**
  - Mississippi Department of Agriculture and Commerce
    - www.mdac.state.ms.us
  - Mississippi Department of Wildlife, Fisheries and Parks
    - www.mdwfp.com
- **UNIVERSITY**
  - Center for Aquatic and Invasive Plants
    - aquat1.ifas.ufl.edu
  - Mississippi State University Extension
    - msucares.com
- **PROFESSIONAL SOCIETY**
  - MidSouth Aquatic Plant Management Society
    - www.msapms.org
- **FOUNDATION**
  - Aquatic Ecosystem Restoration Foundation
    - www.aquatics.org

Questions

Gray Turnage, PhD
Assistant Res/Ext Professor
Mississippi State University
Geosystems Research Institute
Ph: 662-325-7527
E-mail: Gturnage@gri.msstate.edu

www.gri.msstate.edu