

*The*  
**Florida Invasive Plant  
Education Initiative**

By Karen Brown and Amy Richard

University of Florida/IFAS  
Center for Aquatic and Invasive Plants  
Gainesville, FL



**Southeast EPPC 2010**

*For 30 years ~*

**The Center for Aquatic and Invasive Plants (CAIP)**  
has been assembling and disseminating educational  
resources about aquatic and invasive plants.

**<http://plants.ifas.ufl.edu>**



# CENTER FOR AQUATIC AND INVASIVE PLANTS

## UNIVERSITY OF FLORIDA, IFAS



### Search

### Navigation

- ▾ Plant Info & Images
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  - Image Requests
- APIRS Database
- AQUAPHYTE Newsletter
- Plant Glossary

### Welcome to the Center for Aquatic and Invasive Plants

The **UF/IFAS Center for Aquatic and Invasive Plants** is a multidisciplinary research, teaching and extension unit directed to develop environmentally sound techniques for the management of aquatic and natural area weed species and to coordinate aquatic plant research activities within the State of Florida. The Center was established in 1978 by the Florida legislature. Directed by **Dr. William Haller**, the Center utilizes expertise from many departments within UF/IFAS and its Agricultural Research and Education Centers throughout Florida.

The mission of the **CAIP Information Office** is to inform and educate all stakeholders about the impacts and management of invasive plants.

Please use the navigation tools to the left, or visit one of our information portals to the right, each of which has a separate search site function.

### What's New:

- Cold-induced Fish Kills in Florida Waters
- *Aquaphyte* Newsletter Volume 29 Number 1 Winter 2009
- UF-IFAS Aquatic Weed Control Short Course: May 3-6, 2010; Coral Springs, FL
- Activity Booklet: Understanding Invasive Aquatic Weeds - brought to you by

### Visit Our Additional Sites:



**CENTER FOR AQUATIC AND INVASIVE PLANTS**  
UNIVERSITY OF FLORIDA, IFAS

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**Navigation**

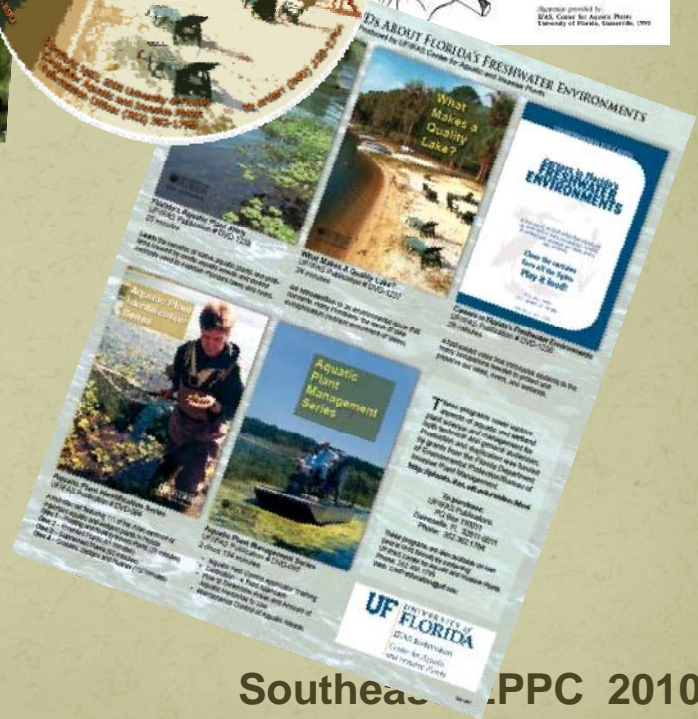
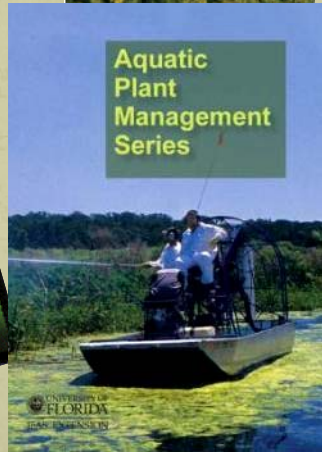
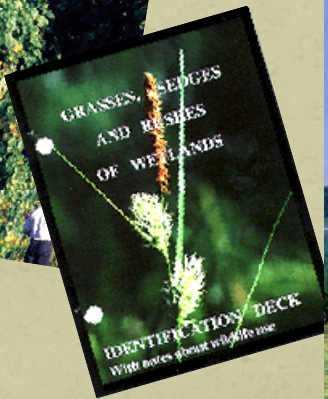
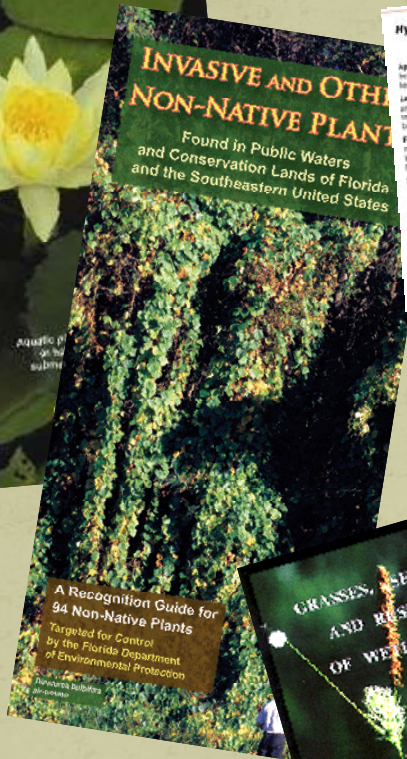
- Plant Information & Images
- APIRS Literature Collection and Database
- AQUAPHYTE Newsletter
- Glossary of Plant Terms
- Books, Field Guides, and Online Resources
- **Educational Products and Tools**
- Invasive Plant Laws
- Meetings
- Osceola County Hydrilla & Hygrophylla Demonstration Project
- IFAS Assessment
- County Extension Offices
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- Links
- Contact Us

**Educational Products and Tools**

- Plant Recognition / Identification Tools
  - Recognition Cards: Invasive and Non-native Plants You Should Know
  - Freshwater Plants in the Southeastern United States: A Recognition Guide for 133 Plants
  - Invasive and Other Non-Native Plants in the Southeastern United States Found in Public Waters and Conservation Lands of Florida and the Southeastern United States: A Recognition Guide for 94 Plants
  - ID Deck: Aquatic and Wetland Plants
  - ID Deck: Grasses, Sedges and Rushes
- Photo-Murals
  - Photo-Mural: Native Freshwater Plants
  - Photo-Mural: More Native Freshwater Plants
  - Photo-Mural: Invasive Non-Native Plants
  - Photo-Mural: More Invasive Non-Native Plants
  - Photo-Mural: Set of Four
- DVD Programs
  - Aquatic and Wetland Plant Identification Series Now Available as a 4 disc DVD set (IFAS Catalog No. DVD 084) - \$35.00
  - Aquatic Plant Management Series (2 DVD set) - \$25.00
  - Careers in Florida's Freshwater Environments (DVD) - \$25.00
  - Florida's Aquatic Plant Story (DVD) - \$25.00
  - What Makes a Quality Lake? (DVD) - \$25.00
- Line Drawings: Wetland and Invasive Plants
- Image Request Form
- Identification & Biology of Non-Native Plants in Florida's Natural Areas, Second Edition - by K.A. Langeland and K. Craddock Burks, Editors



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# Photomurals with 'Teaching Points'

- *Native Freshwater Plants (Part 1 and 2)*
- *Invasive Non-Native Plants (Part 1 and 2)*



# General outreach only goes so far...



# Florida Invasive Plant Education Initiative



An education outreach program and curricula about native, non-native and especially invasive plants for use by science teachers and other disciplines (language arts, social studies)



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# Goals

- ❖ **Capture** the attention of educators, students (maybe even their parents) and raise awareness;
- ❖ **Inform** teachers and students of challenges and costs associated with invasive plant management in Florida and around the world;
- ❖ **Provide** useful information on how they can help;
- ❖ **Gain a greater acceptance** of plant management.

**Year 1 & 2** Introduced the subject of invasive plants to teachers at the Florida Association of Science Teachers conference & other venues





## Year 1 & 2

Conducted workshops to find out what they wanted and needed to teach this subject

# Top Requests from Teachers

- ❖ Website for easy access to materials
- ❖ PowerPoint™ lessons (with bells & whistles)
- ❖ Supporting materials
- ❖ Sunshine State Standards
- ❖ Hands-on materials
- ❖ Continued support
- ❖ Workshops to enhance background knowledge

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Please use the navigation tools to the left, or visit one of our information portals to the right, each of which has a separate search site function.

- Visit Our Additional Sites:
-  Plant Management in Florida Waters
  -  Education Initiative and Curriculum



Home | Center for Aquatic & Invasive Plants | Plant Management in FL Waters | About Us | Links | Site Map | Vic Ramey Tribute |


Welcome

**The Florida Invasive Plant Education Initiative** was created to provide educators with the information and resources they need to teach about the benefits of Florida's native plants and the harmful impacts that some invasive, non-native plants are having on our natural areas and neighborhoods. Along the way, we are striving to inspire learners of all ages to spend more time looking at plants and learning about their importance to our state's ecological well-being.

Our ultimate goal is for today's youth to draw on this knowledge as they mature into responsible and committed environmental stewards for Florida, the "land of flowers."

To accomplish this, we've developed four core modules (see sidebar on right) with related lessons and hands-on activities. We hope you find these

**Apply for PLANT CAMP (CLICK HERE)**



About the Modules

- Module 1 ~ Silent Invaders  
Defines native versus non-native plants and why some are considered to be invasive.
- Module 2 ~ A Fish Tale

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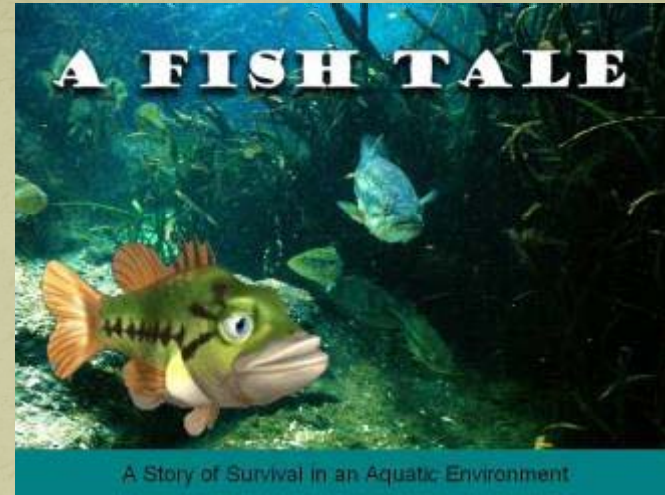
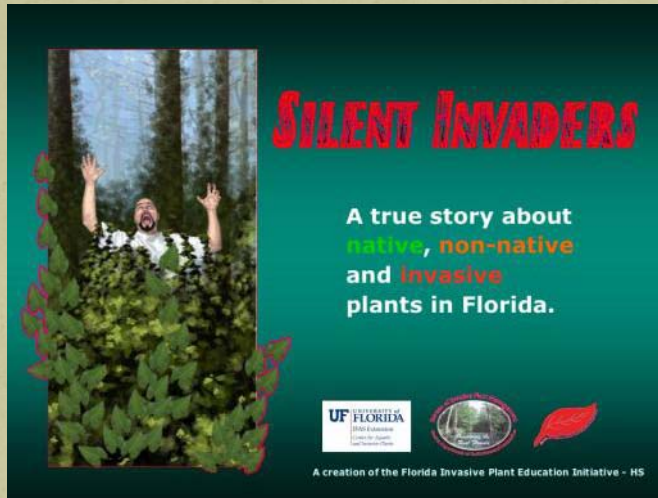
WHAT'S NEW!

- Modules
- Sunshine State Standards
- FREE Resources
- Glossary
- Download Flash Cards
- Plant ID Resources
- FIND Plants in Your Region
- Events
- Grant Opportunities
- What is It?  
Plant ID Services



❖ Website for easy access, using formats they can alter for their needs.

## ❖ Top request: PowerPoint™ Presentations



Florida Invasive Plant Education Initiative and Curriculum

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### Module 1 – Silent Invaders

About the Video



Watch Now: [Silent Invaders!](#) - [A Fish Tale](#) - [Why Manage?](#)  
 Order DVD  
[Silent Invaders Teacher Guide](#) [UE MS HS](#)  
 Module 1 Lessons and Activities

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### Module 3 – Why Manage Invasive Plants?

About the Video



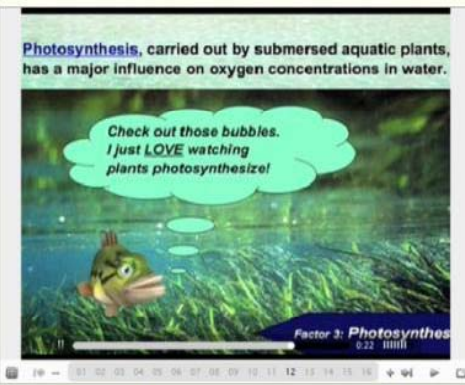
Watch Now: [Silent Invaders!](#) - [A Fish Tale](#) - [Why Manage?](#) - [Viva la Difference!](#)  
 Order DVD  
[Why Manage? Teacher Guide](#) [UE MS HS](#)  
 Module 3 Lessons and Activities

Florida Invasive Plant Education Initiative and Curriculum

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### Module 2 – A Fish Tale

About the Video



Watch Now: [Silent Invaders!](#) - [A Fish Tale](#) - [Why Manage?](#) - [Viva la Difference!](#)  
 Order DVD  
[A Fish Tale Teacher Guide](#) [UE MS HS](#)  
 Module 2 Lessons and Activities



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# ❖ Provide Lots of Supporting Materials



## Free Education Resources for Teachers

For Teachers who are interested in invasive aquatic plants in Florida. These resources are products of the University of Florida unless otherwise stated.

[General Resources](#) | [PDF Files](#) | [Items to Order](#) | [Affordable Resources](#)

### General Resources (links)

[A Glossary of Flower Parts](#) - (254 KB jpeg image)

[A Glossary of Leaf Shapes](#) - (1.6 MB jpeg image)

[Aquatic Plant Problem? Contact your DEP Regional Biologist](#)

[Assorted Photos](#) of native and invasive plants in Florida and the U.S.

[Biological Invasions: A Growing Threat](#) - An article from *Issues in Science and Technology*

[176 Botanical drawings](#) of native and invasive plants in Florida

[Center for Precollegiate Education and Training](#) offers educational programs for teachers and students

[Crossword puzzles](#) about aquatic plant management [Upper Elem.](#) | [Middle](#) | [High](#)

[Extension publications](#) about invasive plants and their management

[Flash Cards: Invasive and Non-native Plants You Should Know](#)

Florida Invasive Species:

- [Water Hyacinth](#) DEP Flash movie (requires downloadable Macromedia Flash player)
- [Lygodium](#) DEP Flash movie (requires downloadable Macromedia Flash player)
- [Hydrilla](#) DEP Flash movie (requires downloadable Macromedia Flash player)



# ❖ Supporting Materials

## PDF Files

A bunch of **Weed Alerts** from the [Department of Environmental Protection](#) - [See weed alert lessons designed for the classroom](#)

[A four page flyer of "Teaching Points"](#) about native and non-native plants, questions and answers made by and for teachers - (PDF 357 MB)

[A Glossary of Flower Parts](#) - (PDF 1.6 MB)

[A Glossary of Leaf Shapes](#) - (PDF 2.14 MB)

**Activity book: Understanding Invasive Aquatic Weeds**, for students of all ages. Information and activities; in a 16-page booklet covering 5 aquatic plants that are invasive regionally and throughout the country. - (PDF 3.5 MB). Also available in quantity for free: <http://www.apms.org/activity.htm>

- This booklet is also available in quantity from the [Aquatic Plant Management Society](#)

**Activity book: The Underwater Forests of Lakes and Rivers** - Information about native and invasive aquatic plants with activities suitable for upper elementary. (PDF 7.3 MB)

**Botany Handbook for Florida** - Learn and understand scientific names of plants with clear illustrations and concise definitions. (PDF 4.44 MB)

**Careers in Florida's Freshwater Environments** booklet - (PDF 3 MB)


- **Careers in Florida's Freshwater Environments** DVD program about environmental occupations in Florida, for elementary and middle school students

**Effects of Grass Carp on Aquatic Vegetation in Lake Conway, Florida** - (PDF 58.95 KB)

UF/IFAS Information Bulletins :

- **Help Protect Florida's Natural Areas from Non-native Invasive Plants (Circular 1204)** (PDF 1,624 KB)
- **Brazilian Pepper-tree Control (Circular SS-AGR-17)** (PDF 344 KB)
- **Natural Area Weeds: Air Potato (*Dioscorea bulbifera*) (Circular SS AGR 164)** (PDF 411 KB)
- **Natural Area Weeds: Chinese Tallow (*Sapium sebiferum*) (Circular SS-AGR-45)** (PDF 372)
- **Natural Area Weeds: Distinguishing Native & Non-native "Boston Ferns" & "Sword Ferns" (*Nephrolepis* spp.) (Circular SS-AGR-22)** (PDF 1,621 KB)
- **Natural Area Weeds: Skunkvine (*Paederia foetida*) (Circular SS-AGR-80)** (PDF 3,659 KB)

# ❖ Supporting Materials



Florida Invasive Plant Education Initiative and Curriculum

A collaboration of UF/IFAS Center for Aquatic Plants & DEP Bureau of Invasive Plant Management

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## Glossary of Plant Terminology

| [A](#) | [B](#) | [C](#) | [D](#) | [E](#) | [F](#) | [G](#) | [H](#) | [I](#) | [J](#) | [K](#) | [L](#) | [M](#) | [N](#) | [O](#) | [P](#) | [Q](#) | [R](#) | [S](#) | [T](#) | [U](#) | [V](#) | [W](#) | [X](#) | [Y](#) | [Z](#) |

**achene** - n. any small, dry fruit with one seed whose outer covering ( [pericarp](#) ) does not burst when ripe. Example: sunflower seed.

**algae** - n. a wide variety of tiny, often microscopic, plants (or plant-like organisms) that live both in water and on land.  
**alga** - singular. [More information](#).

**alternate** (leaf arrangement) - adj. leaves occurring one at a [node](#); one after another, not opposing. [See illustration](#).

**anatomy** - n. the internal structure of an organism and/or its parts.

**angiospermae** - n. a major division of the plant kingdom, commonly known as flowering plants; their reproductive organs develop seeds in the flowers. Example: [duck potato](#). **angiosperms** - plural

**anther** - n. the top of the [stamen](#), which produces the [pollen](#). [See illustration](#).

**aquatic macrophytes** - aquatic plants that are large enough to be apparent to the naked eye. They can be grouped into four basic categories. Some are rooted in the bottom sediments but protrude above the water's surface ( [emersed](#) ) while others float on the water's surface ( [floating](#) and [floating-leaved](#) ). Still others grow completely below the water's surface ( [submersed](#) ).

Search Site | Search Internet

Help

Curriculum Guide

**Upper Elementary**  
PowerPoint™ Lessons  
Sunshine State Standards

**Middle School**  
PowerPoint™ Lessons  
Sunshine State Standards

**High School**  
PowerPoint™ Lessons  
Sunshine State Standards

FREE Resources

Glossary

Download Flash Cards

Plant ID Resources

FIND Plants in Your Region

Events

What is It?  
Plant ID Services

# Supporting Materials

**Find Plants in Your Region**

Click on your region in Florida to view native and non-native plants in your area. Or see the table below for county listings.

Northwest Region	Northeast Region	Central Region	Southwest Region	Southeast Region
Bay	Alachua	Brevard	Charlotte	Broward
Calhoun	Baker	Clay	Collier	Glades
Escambia	Bradford	Flanler	Desoto	Henry

We would like to collaborate with EDDMapS here.

Favorite Bookmarks



**EDDMapS**  
Early Detection & Distribution Mapping System

Custom:  Login:

Forgot your password? [Add New Password?](#) [Lost your password?](#)

Report Sightings
Distribution Maps
Species Information
Tools & Training
My EDDMapS
About

### Invasive Species Mapping Made Easy!



EDDMapS, started in 2005 with Southeastern U.S. focus, is now providing a picture of the distribution of invasive species across the U.S.

- ✓ Fast and easy to use - no knowledge of GIS required
- ✓ Web-based mapping of invasive species distribution to help fill gaps and identify "leading edge" ranges
- ✓ Facilitates Early Detection and Rapid Response implementation with online data entry forms, e-mail alerts and network of expert verifiers
- ✓ One Database for both local and national data
- ✓ Data can be searched, queried and downloaded in a variety of formats
- ✓ Cooperates with and aggregates data from other invasive species mapping projects
- ✓ Custom/hosted applications can be quickly and inexpensively developed

#### Who's Using It?

- ✓ Southeast Exotic Pest Plant Council
- ✓ Florida Exotic Pest Plant Council
- ✓ Everglades Cooperative Invasive Species Management Area
- ✓ Florida Invasive Species Partnership
- ✓ Alaska Exotic Plant Information Clearinghouse
- ✓ Mid-Atlantic Invasive Plant Council
- ✓ Invasions of Texas

#### Statistics

935,634 County Reports  
236,617 Point Reports  
1,738 Species / 1,227 Users

#### Recent Reports

- ✓ yellow archangel by Meghan Fellows in Fairfax County, Virginia
- ✓ Japanese barberry by Sharon Plumb in Washington County, Vermont
- ✓ Burmese python by Chris Cannon in Miami-Dade County, Florida
- ✓ cutleaf beard by Monika Chendler in Winona County, Minnesota
- ✓ cutleaf beard by Monika Chendler in Winona County, Minnesota

#### Report Images



Report by: Karol A. Rankin, University of Georgia

#### Map It!



Quickly Enter or Select on a Map the Location of Invasive Species in Your Area.

#### Zap It!



Remove or Treat the Invasive Species You Find, Use EDDMapS to Document that Treatment.

#### Map it Again!



Monitor the Occurrence, Report the Monitoring Efforts and Follow-up Treatments.

#### Supporters





Developed by The University of Georgia - Center for Invasive Species and Ecosystem Health.  
Last updated on Monday, March 04, 2008 at 10:40 AM

www.eddmaps.org

Favorite Bookmarks

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#### Data Sharing Partners




#### Statistics

104,977 Reports  
888 Species

#### Recent Reports

- ✓ Burmese python by Chris Cannon in Miami-Dade County, Florida
- ✓ Chinese yellowtree by Peter Johnson in Clay County, Florida
- ✓ Chinese yellowtree by Peter Johnson in Clay County, Florida
- ✓ Cassarweed by Sherry Williams in Seminole County, Florida
- ✓ cogongrass by David Dorman in Bradford County, Florida

#### Cooperative Invasive Species Management Areas

- ✓ Alachua County Cogongrass Initiative
- ✓ Apalachicola Invasive Working Group
- ✓ Bradford County CWMA
- ✓ Central Florida Invasive Species Working Group
- ✓ Everglades CISMA
- ✓ First Coast Invasive Working Group
- ✓ Florida Keys Invasive Task Force
- ✓ Green Swamp CISMA

www.eddmaps.org/florida

Center for Invasive Species and Ecosystem Health  
BUGWOOD NETWORK

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The University of Georgia  
School of Forestry and Natural Resources  
College of Agricultural and Environmental Sciences

Forestry Images

IPM Images

Insect Images

Forest Pests

Bark Beetles

#### 48 Publications

48 Image Archive

Topics:

- Agriculture
- Bark Beetles
- Suppressed WMA
- Disturbance Trees
- Cogongrass
- EMMMapS
- EPPC
- Forest A type
- Forest Pests
- Forest Productivity
- Forestry
- Forest



INVASIVE.ORG

What's New

First parasitic nematodes reported in bristly crows  
Five Amphibian Insects Found in Hawaii

LEARN MORE ABOUT THE  
CENTER FOR INVASIVE SPECIES  
ECOSYSTEM HEALTH

www.bugwood.org

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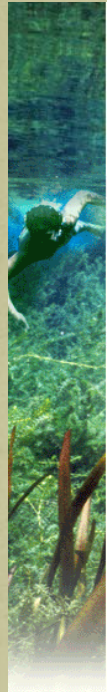




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# ❖ Adapt pre-existing materials



## Flash Cards: Invasive and Non-native Plants You Should Know

### COMPLETE SET

Download individual flash cards (PDF - average file size, 500 KB) or [purchase the set](#).



**P** = Prohibited. Some of the plants featured in this card deck are officially prohibited by federal or state law.

**Cover / Introduction / Reference Section** (PDF - 1 MB) includes the following:

- Plants by Scientific Name
- Plants by Common Name
- Flower Parts
- Stems
- Roots
- Leaf Shapes
- Leaf Bases & Attachments
- Leaf Arrangements
- Habit
- Glossary of Plant & Flower Parts
- Bibliography

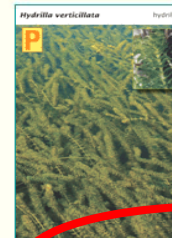
#### by Common name

Flash Cards: (PDF - average file size, 500 KB)

- air-potato
- alligator weed
- asparagus fern
- Australian pine
- bishopwood
- bowstring hemp
- Brazilian jasmine
- Brazilian pepper

#### by Scientific name

- *Abrus precatorius*
- *Acacia auriculiformis*
- *Albizia julibrissin*
- *Albizia lebbbeck*
- *Aleurites fordii*
- *Alternanthera philoxeroides*
- *Ardisia crenata*
- *Ardisia elliptica*



### *Hydrilla verticillata* hydrilla

**Appearance:** Submersed, usually rooted, aquatic perennial herb with slender ascending stems to 9m (30 ft) long; heavily branched.

**Leaves:** Whorled, 3-8 per whorl, 2-4 mm (0.1-0.2 in) wide and 6-20 mm (0.2-0.8 in) long, bearing coarse (visible) teeth along the margins and usually 1-4 small conical bumps along underside of midrib, which is often red.

**Flowers:** Male flowers detached and free floating at maturity, with 3 sepals and 3 petals, white to reddish brown, about 2 mm (0.7 in) long, releasing floating pollen from stamens when flower pops open at water surface.

**Fruit:** N/A

#### Ecological threat:

Competitively displaces native submersed plant communities. In dense stands, alters fisheries populations, causes shifts in zooplankton communities, and affects water chemistry. FLEPPC Category I

**Distribution:** NW, NE, C, SW, SE



#### Field Notations

HYDRVERT/HYVE3

<http://plants.ifas.ufl.edu>

# ◆ All lessons correlate to Sunshine State Standards

## Module 1 ~ Silent Invaders Summary of Sunshine State Standards (Grades 4 - 12)

This is a summary of all the linked standards for Module 1. See the individual activities for the specific linked standards. Note: Standards in black font are explicitly addressed by the material. Those in blue are touched on briefly and can be more fully developed by the teacher.



### 4<sup>th</sup> Grade

- LA.4.1.5.1: TSW use vocabulary that is introduced and taught directly.
- LA.4.1.5.2: TSW listen to, read, and discuss familiar and conceptually challenging text.
- LA.4.1.5.3: TSW use context clues to determine meanings of unfamiliar words.
- LA.4.1.7.3: TSW determine explicit ideas and information in grade-level text, including relevant supporting details, implied message, inferences, chronological order of paraphrasing.
- LA.4.2.2.1: TSW locate, explain, and use information from text features (e.g., text charts, graphs, diagrams, illustrations).
- LA.4.2.2.2: TSW use information from the text to answer questions related to explicit details.
- LA.4.2.2.3: TSW organize information to show an understanding of main ideas or supporting details.
- LA.4.3.1.1: TSW generate by generating ideas from multiple sources (e.g., text, b drawing, writers notebook, group discussion) based upon teacher-directed topics.
- LA.4.3.1.2: TSW generate by organizing ideas using strategies and tools (e.g., text chart, log) to make a plan for writing that prioritizes ideas and addresses the main idea.
- LA.4.3.2.1: TSW draft writing by using a prewriting plan to focus on the main idea supporting details that shows an understanding of facts and/or opinions.
- LA.4.3.3.4: TSW revise by applying appropriate tools or strategies to evaluate an draft.
- LA.4.3.5.1: TSW prepare writing using technology in a format appropriate to audience and occasion.
- LA.4.3.5.2: TSW use elements of spacing and design to enhance the appearance where appropriate.
- LA.4.4.2.1: TSW write in a variety of informational/expository forms (e.g., summaries, instructions, graphs, tables, experiments, rubrics, how-to manuals).
- LA.4.4.2.2: TSW record information (e.g., observations, notes, lists, charts, map including visual aids as appropriate).
- LA.4.5.2.1: TSW listen to information presented orally and show an understanding of appropriate resources, gather and record information, noting the difference between appropriate resources, gather and record information, noting the difference between video, presentations).
- LA.4.5.4.2: TSW determine and use appropriate digital tools (e.g., word process graphic organizers) for publishing and presenting a topic.
- SC.4.E.6.6: TSW identify resources available in Florida (water, phosphate, oil, iron energy).
- SC.4.L.16.4: TSW compare and contrast the major stages in the life cycles of plants that undergo incomplete and complete metamorphosis, and flowering and SC.4.N.1.4: TSW recognize ways plants and animals, including humans, can help.
- SS.4.C.2.3: TSW discuss public issues in Florida that impact the daily lives of its citizens.
- SS.4.E.1.2: TSW explain the importance of public service, voting, and volunteerism.
- SS.4.E.1.2: TSW explain Florida's role in the national and international economy businesses to the state.
- SS.4.G.1.1: TSW identify physical features of Florida.



## Module 2 ~ A Fish Tale

### Summary of Sunshine State Standards (Grades 4 - 12)

This is a summary of all the linked standards for Module 2. See the individual activities for the specific correlated standards. Note: Standards in black font are explicitly addressed by the material. Those in blue are touched on briefly and can be more fully developed by the teacher.



### 4<sup>th</sup> Grade

- LA.4.1.5.1: TSW use vocabulary that is introduced and taught directly.
- LA.4.1.5.2: TSW listen to, read, and discuss familiar and conceptually challenging text.
- LA.4.1.5.3: TSW use context clues to determine meanings of unfamiliar words.
- LA.4.1.7.3: TSW determine explicit ideas and information in grade-level text, including but not limited to main idea, relevant supporting details, implied message, inferences, chronological order of events, summarizing, and paraphrasing.
- LA.4.2.2.1: TSW locate, explain, and use information from text features (e.g., table of contents, glossary, headings, charts, graphs, diagrams, illustrations).
- LA.4.2.2.2: TSW use information from the text to answer questions related to explicitly stated main ideas or relevant details.
- LA.4.2.2.3: TSW organize information to show an understanding of main ideas within a text through charting, mapping, or summarizing.
- LA.4.3.1.1: TSW generate by generating ideas from multiple sources (e.g., text, brainstorming, graphic organizer, drawing, writers notebook, group discussion) based upon teacher-directed topics and personal interests.
- LA.4.3.1.2: TSW generate by organizing ideas using strategies and tools (e.g., technology, graphic organizer, KWL chart, log) to make a plan for writing that prioritizes ideas and addresses the main idea and logical sequence.
- LA.4.3.2.1: TSW draft writing by using a prewriting plan to focus on the main idea with ample development of supporting details that shows an understanding of facts and/or opinions.
- LA.4.3.3.4: TSW revise by applying appropriate tools or strategies to evaluate and refine the draft (e.g., peer review, checklist, rubric).
- LA.4.4.2.1: TSW write in a variety of informational/expository forms (e.g., summaries, procedures, recipes, instructions, graphs/tables, experiments, rubrics, how-to manuals).
- LA.4.4.2.2: TSW record information presented orally and show an understanding of key points.
- LA.4.5.2.2: TSW plan, organize, and give an oral presentation and use appropriate voice, eye, and body movements for the topic, audience, and occasion.
- LA.4.4.2.1: TSW select a topic for inquiry, refine a predetermined search plan.
- LA.4.5.2.2: TSW apply evaluative criteria (e.g., readability, currency, accuracy) for selecting and using a variety of appropriate resources, gather and record information, noting the difference between options and fact.
- SC.4.E.6.2: TSW recognize that humans need resources found on Earth and that these are either renewable or nonrenewable.
- SC.4.E.6.6: TSW identify resources available in Florida (water, phosphate, oil, limestone, silicon, wind, and solar energy).
- SC.4.L.17.2: TSW explain that animals, including humans, cannot make their own food and that when animals eat plants or other animals, the energy stored in the food source is passed to them.
- SC.4.L.17.3: TSW trace the flow of energy from the Sun as it is transferred along the food chain through the producers to the consumers.
- SS.4.E.1.2: TSW recognize ways plants and animals, including humans, can impact the environment.
- SS.4.C.2.1: TSW discuss public issues in Florida that impact the daily lives of its citizens.
- SS.4.C.2.3: TSW explain the importance of public service, voting, and volunteerism.
- SS.4.E.1.2: TSW explain Florida's role in the national and international economy and conditions that attract businesses to the state.
- SS.4.G.1.1: TSW explain Florida's weather impacts Florida.
- SS.4.G.1.4: TSW interpret political and physical maps using map elements (title, compass rose, cardinal directions, intermediate directions, symbols, legend, scale, longitude, latitude).

### 5<sup>th</sup> Grade

- LA.5.1.5.1: TSW demonstrate the ability to read grade level text.
- LA.5.1.5.1: TSW use vocabulary that is introduced and taught directly.
- LA.5.1.5.2: TSW listen to, read, and discuss familiar and conceptually challenging text.
- LA.5.1.5.3: TSW use context clues to determine meanings of unfamiliar words.
- LA.5.1.7.3: TSW determine the main idea or essential message in grade-level text through inferring, paraphrasing, summarizing, and identifying relevant details.
- LA.5.2.2.1: TSW locate, explain, and use information from text features (e.g., table of contents, glossary, index, transition words/headings, headings, subheadings, charts, graphs, illustrations).



## Module 3 ~ Why Manage Invasive Plants?

### Summary of Sunshine State Standards (Grades 4 - 12)

This is a summary of all the linked standards for Module 3. See the individual activities for the specific standards. Note: Standards in black font are explicitly addressed by the material. Those in blue are touched on briefly and can be more fully developed by the teacher.



- LA.4.1.5.1: TSW use vocabulary that is introduced and taught directly.
- LA.4.1.5.2: TSW listen to, read, and discuss familiar and conceptually challenging text.
- LA.4.1.5.3: TSW use context clues to determine meanings of unfamiliar words.
- LA.4.1.7.3: TSW determine explicit ideas and information in grade-level text, including but not limited to main idea, relevant supporting details, implied message, inferences, chronological order of events, summarizing, and paraphrasing.
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- SS.4.G.1.4: TSW interpret political and physical maps using map elements (title, compass rose, cardinal directions, intermediate directions, symbols, legend, scale, longitude, latitude).









# ❖ Maintain communication for additional support

Reply Reply to All Forward Move Delete Junk Close

## Re: Bingo

Wendy Norton [nortonw@osceola.k12.fl.us]

You forwarded this message on 11/9/2007 1:00 PM.

Sent: Friday, November 09, 2007 12:14 PM

To: RICHARD,AMY N

I have to tell you my low level 7th graders had a ball with the bingo today they were screaming and yelling it was an amazing teaching moment.

Best Regards,

Wendy Norton-  
STAR Discovery Educator  
Science Lab Teacher  
Bellalago Academy

Reply Reply to All Forward Move Delete Junk Close

## Re: artificial plants

Wendy Norton [nortonw@osceola.k12.fl.us]

Sent: Tuesday, November 06, 2007 6:32 PM

To: RICHARD,AMY N

I watched the Aquatic Plant story today the worksheet had the kids engaged the whole time. thanks,

Best Regards,

Wendy Norton-  
STAR Discovery Educator  
Science Lab Teacher  
Bellalago Academy  
3651 Pleasant Hill Road  
Kissimmee, FL 34746

## Re: A Fish Tale quick question

Nancy Palmer [nancy\_palmer@scps.k12.fl.us]

Extra line breaks in this message were removed.

Sent: Wed 11/12/2008 10:10 AM

To: RICHARD,AMY N

Hey Amy,

Yes, I think it would helpful to have definitions for key words. It would take any guesswork out of the definitions if they were already there.

Thank you!!!  
Nancy

Original Message

From: Solomon, Coni - Ft King Middle School [Coni.Solomon@manion.k12.fl.us] Sent: Tue 10/14/2008 8:44 PM

To: RICHARD,AMY N

Cc:

Subject: RE: FCAT and "guiding" questions for SILENT INVADERS

Amy,

I took a quick look at the demo site and it looks great! Y'all are doing a super job of listening to our feedback (unusual in the educational field:-)

Here are a few responses to your questions:

1. Five sections look good and are easy for navigation. One question: There isn't a section for tiles 4-19. Is it considered vocabulary development? Or Introduction to Non-Native Species?
2. I checked out the middle school link and like the guiding questions. Esp good for either using as a Powerpoint, general review or, for ESE/Special area kids, it can be duplicated for them to follow along with their own "hard copy." For some students, it is required by law through their IEP to give them their own materials (as an accommodation).
3. The words aren't hard-and-fast FCAT words, but they are subject specific and appear to meet the needs of the lesson. Sometimes too many words at a time is just too much for the kids to absorb. For the elementary level, it is a good introduction to the Vocab., for middle it is a good reinforcement (some new words some already introduced words). Check with high school teachers for their input as to the appropriateness for them. I'm clueless on that one.
4. There probably will need to be varying levels of FCAT questions as upper elementary questions would and should be vastly different from high school questions. You could use the same types of questions - just "amp up" the question to meet the need of the higher academic levels.

Hope this is helpful. Have a great day!

Coni Solomon  
Ft. King Middle School  
[Coni.Solomon@manion.k12.fl.us](mailto:Coni.Solomon@manion.k12.fl.us)

Teamwork is simply individual efforts melded together to achieve excellence.

# ❖ Build infrastructure to support annual in-service workshops and continuing education for teachers.

**PLANT CAMP**  
June 14 - 18, 2009 *for teachers only*

- Learn about native, non-native and invasive plants and animals.
- Expand your knowledge and field experience with aquatic and upland plant surveys.
- Watch the ecology of native, non-native and invasive plants and animals in Florida's natural areas.
- Practice a few and simple techniques to protect specific plants, animals and ecosystems.
- Discover the impacts invasive plants are having on Florida's agriculture and economy.
- Earn professional development credits.
- Company and travel costs provided.

**Why learn about invasive plants?**  
They are expanding with rapidity on Florida's water and land. They are not only a threat to our native plants and animals, but they are also a threat to our economy. Invasive plants are causing a loss of \$1.5 billion in Florida's agriculture and tourism industries each year. Invasive plants are also a threat to our environment and our way of life. Invasive plants are also a threat to our way of life.

**Workshop limited to 40 teachers** (space limited). <http://plants.ifas.ufl.edu/education/plantcamp>

Learn more about PLANT CAMP 2009 - <http://plants.ifas.ufl.edu/education/plantcamp>

### 2009 Summer PLANT CAMP Application

<http://plants.ifas.ufl.edu/education/plantcamp>

**Thank you for your interest in our 2<sup>nd</sup> annual on-site training workshop for teachers only about Florida's native, non-native plants and animals. In a perfect world, every one of you would be able to attend our workshop. However, due to limited resources, participation is limited to 40 teachers. If you are not selected, please stay tuned for opportunities to attend future events and thank you for being leaders in education!**

**When:** June 14-18, 2009 **Where:** University of Florida / Center for Aquatic and Invasive Plants / Gainesville, FL

**IMPORTANT** - Applications will be accepted from **UPPER ELEMENTARY, MIDDLE and HIGH** school teachers. Participants are chosen by a committee of teachers and CAP staff. **All entry packets MUST contain the following, completed items:**

- Application:** Note: An incomplete application may result in being disqualified.
- Letter of recommendation:** from your principal or school letterhead, stating why you should be selected to attend, teaching about conserving Florida's natural areas.
- Minion statement:** from you on how and when the new knowledge and materials will be shared with others. Be sure to include the number of students and teachers who will benefit.

**Participants will be notified by February 23, 2009.** **DUE DATE: February 13, 2009**  
Send completed application packet to:  
2009 PLANT CAMP  
UF/IFAS Center for Aquatic and Invasive Plants  
7902 NW 72<sup>nd</sup> St  
Gainesville, FL 32609  
Phone: 352-392-6843 • Fax: 352-392-3402  
Email: [CAP\\_staff@plants.ifas.ufl.edu](mailto:CAP_staff@plants.ifas.ufl.edu)  
LEARN MORE: <http://plants.ifas.ufl.edu/education>

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LEARN MORE: <http://plants.ifas.ufl.edu/education>

Grade level(s) teaching? \_\_\_\_\_ Subject you will teach (2009-2010) \_\_\_\_\_

Name \_\_\_\_\_

Home Mailing Address (Note: Please be sure to provide your preferred physical mailing address to us on card attached, if needed.)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Home Name/Address \_\_\_\_\_

Phone # \_\_\_\_\_ E-mail \_\_\_\_\_

Home # \_\_\_\_\_ Cell Phone # \_\_\_\_\_





A collaboration of UF/IFAS Center for Aquatic and Invasive Plants & FWC-Invasive Plant Management Section

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### PLANT CAMP 2010 (for teachers only) - APPLY NOW!

June 13-17, 2010

Applications due Feb 19; Selected participants notified by February 26.

*Workshop made possible by the Florida Fish and Wildlife Conservation Commission / Invasive Plant Management Section*



**PLANT CAMP Flyer**  
- PDF 1 MB



**Application\***  
- PDF 228 KB



**Sample Agenda**  
- PDF 363 KB

\*Contact PLANT CAMP to request a fillable PDF form and email back to us.

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## PLANT CAMP Goals

- ❖ Provide in-depth training on topic of invasive plants (4.5 days).
- ❖ Develop enthusiasm for subject among teachers so they will pass it along to their students.
- ❖ Gain greater appreciation (& acceptance) of plant management methods.

# Welcome Session



# Day 1 — Upland Plants



*Project WILD!*

# Day 2 — Why Manage Invasive Plants?



## Day 3 — Aquatic Plants and Water Quality






## Day 3 ~ Invasive Plant Video Festival



For teachers and students...

# Day 4 — Curricula Development

## Game Show ~ “Manage This!”



**Boater**

*“Row, row, row my boat, everywhere I can – motoring, sailing, or paddling along; that’s my favorite plan.”*


Priorities Stay Afloat - Open Waters



### Factory Owner

*“I want to sell the stuff that makes the whole world swim – goggles, snorkels, boats – keep those customers coming! My factory employs about eighty local residents.”*

Priorities Sell Stuff - Protect Fact



**Politician**

*“I want to please everybody – builders, homeowners, shoppers, boaters, nature-lovers, VOTERS!”*


Priorities Please Everybody - Get Elected



### Farmer

*“This land is My land, this land ain’t your land. I want to grow stuff; you think you know stuff. I take care of my own business.”*

Priorities Self Regulation - Access to Clean Water



**Lakeside Restaurant Owner**

*“How you like-a my fishy filets? Eh? Come and try the fishy soup; yes, maybe with a cool drink at a table over-looking the water – et’sa nice, yes?”*

Priorities Happy, Well-fed Customers – and Plenty of Them.



### Nature Lover

*“I like my habitats diverse, my species local, and my humans quiet and scarce.”*

Priorities Healthy Habitats

# Game Show ~ "Manage This!"

Wheel of Focus



## Old World climbing fern



### cat-tails *Typha* species



PROS

CONS

- Cat-tails provide ideal habitat for many birds and insects.
- Several parts of the plant can be eaten including underground stems and the leaf base. The leaf spike can even be eaten like corn on the cob; plants were a common food source for the Native Americans.
- Early Americans also used the absorbent fluff of the cat-tail seed heads as diapers.
- Today, scientists are experimenting with cat-tail seed fluff to see if it can be used in cleaning up oil spills.
- Cat-tails also are being considered as a crop, as an alternative source for oil.

- Sometimes cat-tails are unpopular because they can grow like weeds in lakes or stream water retention ponds. This is urban lakes & of extra water where the lake.
- During long, an important have access to lake.

### manatee *Trichechus manatus latirostris*

NATIVE



PROS

CONS

- The manatee is Florida's state marine mammal.
- Female manatees aren't able to reproduce until they are five to nine years old. And they give birth to one calf every two to five years. However, they may live to 30 years old.
- Manatees are an endangered species. Their leading cause of death is collisions with boats.
- Manatees eat more than 60 species of plants, including red grass, mangrove leaves, water hyacinth, and even non-native plants like water hyacinth and hydrilla.
- They grow to an average of 10 feet in length and weigh 1,000 pounds. An adult manatee spends six to eight hours eating, and the rest of the day resting or loafing.
- Some early explorers thought manatees were mermaids. Obviously they had been off sea for a long time or had poor eyesight.
- Florida has the largest population of manatees. There are some towns all over the world to see these aquatic mammals which is great for our economy. In 2006, there were more than 3,000 manatees living in Florida waters.



### coconut palm *Cocos nucifera*

NON-NATIVE



PROS

CONS

- Coconut palm trees are an important food source. The edible fiber found inside the coconut (or seed) is tasty and nutritious. So is the watery liquid found inside the nut.
- Coconut milk is made by cooking grated coconut in water or milk.
- Many useful products can be made from coconut palm tree materials. Leaves can be used for brooms, baskets, or even roofing material. The husk and shells can be used for fuel or to make charcoal. Their trunks can be used as building materials.
- In Florida, coconut palms are valuable decorative plants.
- They can tolerate salty habitats, which is why they are often found growing near the ocean. However, coconut palms don't like cold weather. They can be damaged or killed by freezing weather.
- They are a great shade tree, as long as a coconut doesn't fall on you. Falling coconuts have been known to injure people.




# Day 4 — Curricula Development



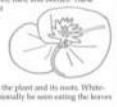
**“Manage This!” in action...**

fragrant water lily *Nymphaea odorata* NATIVE



**PROS**      **CONS**

- The fragrant water lily is an aquatic floating-leaved plant. The leaves, also called pads, float on the surface. Its long leaf stalks are attached to rhizomes down in the mud.
- This water lily can be found in ponds, lakes, and slow-flowing streams around Florida.
- Its leaves (or pads) are almost circular in shape with a notch that reaches to the center. They provide quality habitat for frogs, which like to eat daphnians on top of the pads. Blue like to burk underneath the pads when searching for food and shade.
- It has a strong white flower which is known for its fragrance. It also produces an abundance of pads that attract small bees, flies, and beetles. These insects are important elements of the aquatic habitat.
- Freshwater turtles feed on the leaves, stems, and seeds of water lilies. Muskrate and beavers also feed on the plant and its seeds. White-tailed deer can occasionally be seen eating the leaves of water lilies.



UF IFAS  
UNIVERSITY OF FLORIDA  
INTEGRATED FARM SYSTEMS RESEARCH CENTER  
The information on this page was developed by the University of Florida Integrated Plant Health Laboratory.



# Game Show... *“Manage This!”*



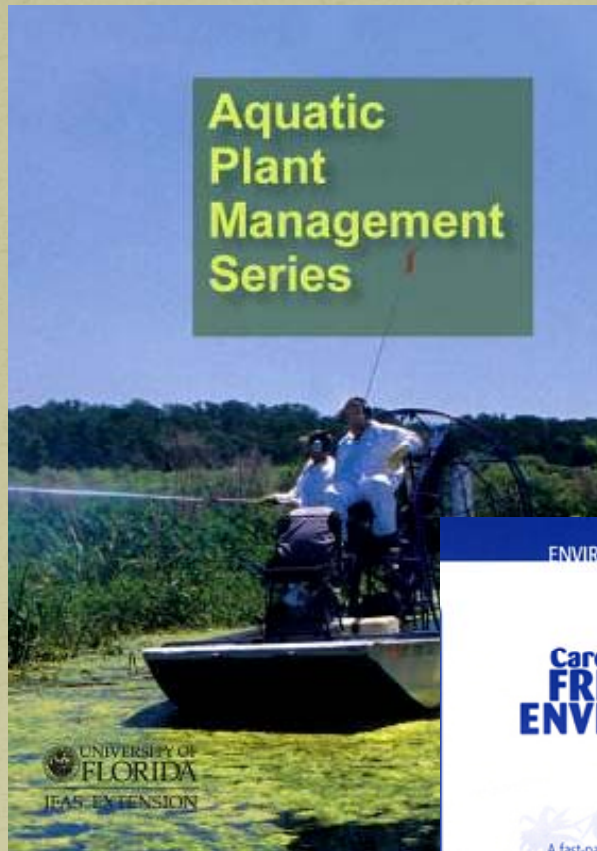
# Day 4 — Graduation



# Teacher Comments

- ❖ “Now I understand how important it is to stay ahead of invasive plants.”
- ❖ “Thanks for getting us out in the real thing.”
- ❖ “Hands-on activities on boats were a real eye opening experience.”
- ❖ “This has given me a deeper insight into the seriousness of the issue.”
- ❖ “Helpful to see the actual invasions of specific species.”
- ❖ “The number of invasive plants was amazing!”

# GREEN JOBS !



Southeast EPPC 2010



**This would not be possible without the long-term support of...**

the FWC / Invasive Plant Management Section  
(formerly the DEP/Bureau of Invasive Plant Management)



*If we can be of service...*

**UF/IFAS Center for Aquatic and Invasive Plants**

7922 NW 71<sup>st</sup> Street

Gainesville, FL 32653

CAIP-education@ufl.edu

352.392.1799

**<http://plants.ifas.ufl.edu>**



**Southeast EPPC 2010**