

# aquatics

Winter 2008



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Cover photo: Professional Lake Management applying Renovate OTF on Wixom Lake, MI. Photo taken by Tyler J. Koschnick.

# Aquatics

Winter 2008/Vol. 30, No. 4



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# Calibration Challenge 2008

**By Brandon Fast**  
Weed Science Graduate Student  
University of Florida Agronomy  
Department

Here's your chance to sharpen your herbicide calibration skills and win a gift certificate to Outback Steakhouse! FAPMS will provide the first individual to submit the correct answers to the following 25 questions with a \$75 gift certificate. The fifth, tenth, and twenty-fifth individuals to submit the correct answers will receive \$50, \$50, and \$25 gift certificates, respectively. Please email your answers to [brandonfast@ufl.edu](mailto:brandonfast@ufl.edu). Have fun, and good luck! Correct answers will be published in the next issue of *Aquatics Magazine*.

1. A circular pond has a diameter of 1054 feet and an average depth of 6 feet. What is the area of the pond in acres?
2. You plan to treat the pond in question 1 with an herbicide at a rate of 24 fluid ounces per surface acre. How many gallons of herbicide will you need to purchase to treat the pond?
3. The tank on your sprayer holds 100 gallons. If you apply the herbicide in question 2 with a carrier volume of 60 gallons per acre, how many fluid ounces of herbicide should you add to the mix to make a full tank (100 gallons) of spray solution?
4. The herbicide label suggests that you add 0.25% v/v non-ionic surfactant to the spray solution. How many ounces of non-ionic

surfactant should you add to the mix to make a full tank (100 gallons) of spray solution?

5. If you apply an herbicide to the pond in question 1 at a rate of 2 quarts per surface acre and 1 gallon of the herbicide contains 2 lbs. of active ingredient, what is the concentration (ppm) in the water? (Assume uniform mixing in the water column)
6. You need to spot treat a few patches of cattails along the edge of a pond. You have an ATV-mounted sprayer with a 20 gallon tank and a handgun. The herbicide label instructs you to spray the cattails with a spray solution that contains 2% herbicide and 0.25% non-ionic surfactant by volume. How many fluid ounces of herbicide will you add to the mix to make 20 gallons of spray solution?
7. How many fluid ounces of non-ionic surfactant will you add to the mix to make 20 gallons of the spray solution in question 6?
8. You just started managing a 70 acre lake, and

your predecessor allowed the entire lake to become infested with Eurasian watermilfoil. The herbicide you are using is labeled for Eurasian watermilfoil control when it is applied to achieve a uniform concentration of 10 ppb active ingredient. If the average depth of the lake is 7 feet and the herbicide contains 3 lbs. active ingredient per gallon, what will the broadcast application rate of the herbicide be in fluid ounces per acre?

9. The herbicide in question 8 will be applied with a helicopter that has a 300 gallon spray tank and is set up to apply 10 gallons per acre. How many gallons of herbicide should be added to the mix to make 300 gallons of spray solution?
10. Based on the information in question 9, how many 300 gallon tanks of spray solution will be needed to treat the 70 acre lake with the helicopter?
11. A 120 acre area of a reservoir is infested with water hyacinth at a density of 4 plants per square foot. If the average fresh weight of the water hyacinth is 2000 grams per plant, what is the total fresh weight (tons) of the water hyacinth in the 120 acre area?
12. If the water hyacinth in question

11 is composed of 95% water by weight, what is the total dry weight (tons) of the water hyacinth in the 120 acre area?

13. You are going to spray the 120 acres of waterhyacinth, and you have narrowed your treatment options down to two herbicides. Herbicide A needs to be applied at 2.5 lbs. active ingredient per acre,

## Some conversion factors and formulas that you may find helpful:

1 mile = 5280 feet

1 acre = 43,560 square feet

Area of a circle =  $3.14 \times (\text{radius}^2)$

1 pound = 453.6 grams

1 ton = 2000 pounds

1 cubic foot = 7.48 gallons

1 gallon of water = 8.345 pounds

1 acre-foot of water = 2,719,041 pounds

Pounds of active ingredient required = acre feet to be treated  $\times$  desired **ppm**  $\times 2.7$

Pounds of active ingredient required = acre feet to be treated  $\times$  desired **ppb**  $\times 0.0027$

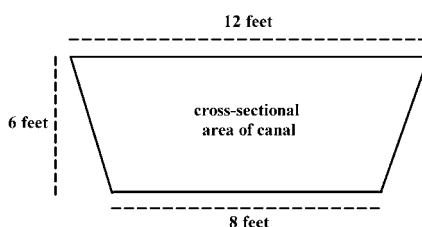
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and one gallon of the product contains 2 lbs. active ingredient. Herbicide B needs to be applied at 4.5 lbs. active ingredient per acre, and one gallon of product contains 3 lbs. active ingredient. If Herbicide A costs \$163 per gallon of product and Herbicide B costs \$124 per gallon of product, which treatment option is less expensive? (Assume that all treatment costs in addition to the herbicide, such as surfactant, are equal for both treatment options)

14. A canal is 10.8 miles long by 40 feet wide. What is the area of the canal in acres?
15. Each side of the canal in question 14 has an 8 foot wide strip of water lettuce that runs along the length of the canal. How many acres does the water lettuce cover?
16. What percentage of the area of the canal is covered by water lettuce?
17. You are going to spray the water lettuce with an herbicide at a rate of 2 quarts of product per acre. You will be spraying the water lettuce on one side of the canal at a time from a boat with a handgun that delivers 4.04 gallons of spray solution per minute. In order to apply the spray solution at 50 gallons per acre, how fast should you drive the boat in miles per hour?
18. You plan to treat Illinois pondweed with Herbicide C, which contains 4.23 lbs. active ingredient per gallon. You calculate that you are going to need 156 gallons of Herbicide C, and you call your supplier. Your supplier only has Herbicide D in stock. Herbicide D contains the same active ingredient as Herbicide C, but Herbicide D only contains 2 lbs. active ingredient per gallon. How many gallons of Herbicide D do you need to purchase?
19. You are in charge of aquatic vegetation management on an irrigation canal. You place an orange on the water surface and determine that it takes the orange 125 seconds to travel 100 feet down-

stream. Then you measure the canal and draw a diagram with the dimensions. Using the water velocity and the cross-sectional diagram of the canal provided below, estimate the flow rate (cfs) of the water in the canal (assuming uniform flow).

20. Using the flow rate calculated in question 19, determine the volume of water (acre-feet) that will flow through the canal in one day (24 hours).
21. You need to treat the canal with an herbicide at a concentration of 35 ppb. The herbicide label provides the following formula:  
Pounds of herbicide required per day = acre feet per day x desired ppb x 0.054



According to that formula, how many pounds of herbicide should be added to the canal in question 20 per day to achieve an herbicide concentration of 35 ppb?

22. The herbicide you are using in question 21 is a dry soluble product that will be tank mixed in water and metered into the canal at 1 gallon per minute throughout the day. Using the amount of herbicide required for the entire day (the answer to question 21), calculate how many pounds of herbicide should be metered into the canal per hour (Assume that the herbicide contains 100% active ingredient).
23. You are considering applying an herbicide to a pond at a rate of 0.5 gallons of product per

surface acre, and the herbicide contains 3.73 lbs. active ingredient per gallon of product. You read the entire herbicide label and find the table below with the use restrictions for water that has been treated with that herbicide.

If the pond covers 30 acres and has an average depth of 4 feet, how long must you wait after applying 0.5 gallons of herbicide per surface acre before you can use the pond water to irrigate a food crop?

24. A body of water contains 490 acre-feet of water. You apply an herbicide to the body of water to achieve a uniform concentration of 2 ppm. The water that contains the herbicide at a concentration of 2 ppm is used to irrigate a nearby crop. If 1 inch of irrigation water from the treated lake is applied to the crop, at what rate is the herbicide being applied to the crop in the irrigation water (pounds active ingredient per acre)?
25. A helicopter has a 20-foot boom and flies at 40 miles per hour. It needs to be able to apply 20 gallons of spray solution per acre. What is the minimum capacity (gallons per minute) of the pump that the owner should purchase for installation on the helicopter? The pump capacity should include an additional 10% for tank agitation.

*Brandon is a PhD student in Weed Science at the University of Florida and enjoys challenging pesticide calibration problems. You may work these problems as an individual or as a team with your colleagues. Often calibration questions contain information that is not relevant to answering the questions, so carefully read each question and be sure to answer the question being asked. Faculty and staff of the University of Florida are not eligible for the gift certificates. Ed.*

Herbicide Concentration in Water (ai)	Drinking	Fishing and Swimming	Irrigation to Food Crops
less than or equal to 0.8 ppm	4 days	0	5 days
less than or equal to 0.4 ppm	3 days	0	4 days
less than or equal to 0.2 ppm	2 days	0	3 days
less than or equal to 0.1 ppm	1 day	0	2 days
less than or equal to 0.05 ppm	1 day	0	2 days

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# Florida Invasive Plant Education Initiative and Curricula: Three Years and Counting

**By Amy Richard**  
Education Initiative  
Coordinator, Center for Aquatic  
and Invasive Plants  
Institute of Food and  
Agricultural Sciences (IFAS),  
University of Florida

Last autumn, I had the pleasure of introducing readers to the Florida Invasive Plant Education Initiative, a concerted education outreach effort launched in September 2005 by the Center for Aquatic and Invasive Plants (CAIP) and the Florida Department of Environmental Protection/Bureau of Invasive Plant Management (DEP/BIPM). This year, we're continuing to move ahead with the support of the same dedicated folks but under a different agency, the Florida Fish and Wildlife Conservation Commission (FWC)/ Invasive Plant Management Section. During the summer transition phase, we were asked to reflect (and record) the accomplishments and milestones of our respective projects.

After doing so, it occurred to me that many of you in the aquatic plant management arena might be interested in learning about these milestones, as they represent a concerted effort to (hopefully) help make your job easier in the future. None of this would have been possible without the vision of (the late) Vic Ramey, with CAIP, and individuals like Jeff Schardt and Don Schmitz, now with the FWC, who continue to recognize the need for

education and outreach, in addition to research and plant management efforts in the field.

We may have a lot of weeds ahead of us, but rest assured there is a small, dedicated team working hard to inform Florida's future citizenry about the importance of acting responsibly when it comes to invasive species. If any of you know of a teacher in your area who might be interested in this project, please feel free to pass this information along. Better yet, invite them to apply for our annual PLANT CAMP (see sidebar). Also, please be sure to let us know YOUR ideas for this outreach endeavor.

## Milestone 1: Blazing a Trail

This invasive plant education initiative which focuses largely on aquatic plants is one of the first of its kind in the United States. Not only have we been assembling and distributing resources for teachers to use in the classroom, but we have also been developing the actual content for a number of learning modules.

The modules are structured around four audio-visual presentations that were produced in the past two years, and encompass science topics that teachers are required to teach to meet the Florida Sunshine State Standards. Within this context, we're introducing young audiences to basic concepts that aquatic plant managers need them to know, if they are going to be responsible environ-

## PLANT CAMP 2009

This summer, we'll be hosting the 3<sup>rd</sup> Annual PLANT CAMP (for teachers only). Scheduled for 4.5 days in mid June, the workshop allows teachers to earn as many as 40 hours of professional development credits (CEUs) for their time spent at the workshop. Participants will be chosen by a committee of science teachers and staff from the UF/IFAS Center for Aquatic and Invasive Plants. The goal of the workshop is to help teachers:

- **Expand** knowledge and lab / field experience in the area of aquatic and upland plant biology;
- **Learn** the difference between native, non-native & invasive plants;
- **Explore** the ecology of native, non-native and invasive plants in Florida's natural areas;
- **Gain** a new approach to plant identification;
- **Discover** the impacts of invasive plants on Florida's ecology and economy;
- **Earn** In-service points for professional development.

For more information and a brief video about the workshop: <http://plants.ifas.ufl.edu/education/plantcamp/index.html>.





mental stewards as adults. These lessons also deliver a message that strives to explain some of the conflicts and negative attitudes often directed at the plant managers by citizens who aren't aware of the problems and expense created by invasive plants in our state.

In keeping with current "new media" trends and technology, the original PowerPoint™ presentations were recently upgraded and re-formatted for delivery on the web, via QuickTime and FLASH, in an effort to make them available to teachers and students 24 hours a day, seven days a week. They are viewable on our website: [http://plants.ifas.ufl.edu/education/flash/silent/silent\\_invaders.html](http://plants.ifas.ufl.edu/education/flash/silent/silent_invaders.html)

Dozens of teachers throughout the state were invited to review and provide feedback on the content and delivery of the presentations. This approach is definitely more time consuming, but it seems to contribute to the enthusiasm many educators have for the materials.

### **Milestone 2: Partnering with Teachers**

The educators that we've had the pleasure of working with have proven to be a deep reservoir of innovative ideas on how to capture the attention of their students. They know what works and what doesn't. All we've had to do is give them a little bit of prompting and then step back and listen to their ideas flow, while taking notes.

This year, I've adopted a system of firing off questions to our teacher list-serve to find out what they need/prefer for a specific lesson or activity. Like clockwork, I can count on receiving a reply from at least eight to twelve individuals. Amazingly, there always seems to be a consensus among them even though they are teaching in different locations around the state and at various grade levels. Their suggestions continue to be invaluable and it saves time to know what they want *before* we finalize a lesson or presentation.

### **Milestone 3: Invasive Plant In-Service Training**

As far as we know, this is the first initiative to provide such intensive training for Florida teachers (upper elementary, middle and high school levels) on the subject of aquatic and upland invasive plants. These annual *PLANT CAMPS* include field trips and rigorous hands-on plant identification activities as a way of generating further excitement and interest in the curriculum. Ultimately, they provide teachers with greater background knowledge on Florida's native, non-native and invasive plants before they begin to teach it to their students. According to participants, the specialized training is especially valuable nowadays, when many are being asked to teach outside of their normal subject area.

It also provides a priceless opportunity to show educators, firsthand, what a serious invasive plant infestation looks like and to give them a glimpse of what life is like for Florida's plant managers. Something about seeing a lake topped out with hydrilla or a forest floor covered with coral ardisia drives the message home far more effectively than any photograph could ever hope to. Based on comments from workshop evaluations, this seems to be THE most effective way getting the message across.

Once we gain their attention, we spend the next day explaining more about why we need to control invasive plants. The use of herbicides and the science behind it is explained at length, which is, perhaps the second most valuable lesson offered that week. Herbicide use has always proven to be a "sticky" subject for many teachers – not to mention the general public. Their perception is often based on outdated information and fear of the unknown. This past June, teachers were introduced to "Orifice P. Nozzlehead" (aka Carlton Layne) during this session. According to the evaluations, this was a real eye opener for many teachers. A sampling of their comments:

- "Bill Haller and Carlton Layne (nozzlehead) were great! I

enjoyed their ability to be humorous while also being serious about the facts."

- "What a great way to learn about pesticides!"
- "Pesticide information was well done; it challenged my view of pesticides as bad."
- "Great information – it made me feel differently."
- "I appreciated having chemical side explained and now have better understanding of biocontrols and drawbacks."
- "I really needed to hear about control with pesticides/herbicides."

Thanks to the generosity of the Florida APMS, teachers enjoyed two nutritious lunches that week, while learning all about Florida's aquatic plant life.

So far, this initiative has trained 94 teachers. At least 250 teachers have been introduced to the materials/lessons (on a limited basis) as a result of outreach mini-workshops and events. For more information: <http://plants.ifas.ufl.edu/education/plantcamp/index.html>

### **Milestone 4: Collaborating with Wildlife**

For the past two years, we've added information and training about invasive *animal* species to our *PLANT CAMPS* by collaborating with the Project WILD program (FWC), a wildlife-focused conservation and environmental education program for educators and their students (K-12th grade). This was in response to teacher requests that we include "critters" in our materials, as they need to teach about entire ecosystems — not just plants. As a result, *PLANT CAMP 2008* participants graduated with both Invasive Plant Education and Project WILD certification. Teachers were equally enthusiastic about the Project WILD lessons and activities and so we will be repeating the effort again in June 2009. It is hoped that as a result of this collaboration, Florida's future taxpayers will have a better understanding of the challenges we all face from invasive species – both plants and "critters."

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# Materials Produced For Education and Outreach – Highlights

For 25 years, the CAIP – DEP / BIPM partnership produced a variety of print materials that continue to be used on a regular basis by agency personnel, applicators, biologists, field technicians, researchers, students and teachers for the purpose of “recognizing” and learning more about Florida’s native, non-native and invasive plants. These materials have provided a strong foundation for our current education initiative to build on. Here’s a list for you to reacquaint yourself with the latest (also viewable on our website: <http://plants.ifas.ufl.edu/node/596>).

**Large Format Photo Murals** — *Native Freshwater Plants* features 45 native plant species (i.e., the plants we’re trying to protect). *Invasive Non-Native Plants* features 37 plant species currently being controlled throughout Florida (both Category I and Category II species). A total of 10,000 posters were printed (5,000 each of 2 posters). Well over 6,000 of these have been given (free) to teachers, environmental educators, libraries, state parks, etc. *Additional sponsors included:* APMS, FAPMS, SeaGrant, United Phosphorus (formerly Cerexagri), and the US Army Corps of Engineers.

— *Native Freshwater Plants* and *Invasive Non-Native Plants*. This second set of photo murals was printed to “round out” the featured Category I and II invasive plant species and also to include several dozen more important native species within Florida’s diverse plant communities. *Additional sponsors included:* APMS, FAPMS, Cerexagri and the US Army Corps of Engineers.

— **Teaching Points (2002)** — a four page document, originally developed to accompany the photo murals (above). This publication was reviewed by teachers and includes the most basic “talking” or teaching points about our invasive plant problem including clear definitions of native, non-native and invasive plants; a brief discussion on how the plants get here; and the challenges associated with their introduction and management.

**Foldout Recognition Guide** — *Freshwater Plants in the Southeastern United States* (2005) – These fully laminated “pocket posters” feature 133 plants with images and brief field characteristics

for use by anyone wanting to learn Florida’s more common aquatic plants. One hundred percent of the freshwater plants depicted are found in Florida. The great majority are also found elsewhere in the United States. Fully laminated (encapsulated). These have been so popular with teachers that we’ve printed additional copies to provide classroom sets (of 15) for use with a number of activities and lessons.

— ***Invasive and Other Non-Native Plants*** (*Found in Public Waters and Conservation Lands of Florida and the Southeastern United States*) (2005) — Features 94 invasive, non-native plants targeted for control by the Florida Department of Environmental Protection. Meant for hikers, boaters, biologists, rangers, homeowners, science students, plant managers -- anyone who wants easy-to-carry reminders to help them quickly ID plants in the wild. One hundred percent of the plants depicted are found in Florida; about 75% are found elsewhere in the southeastern U.S.; 50% are found in Hawaii. Fully laminated (encapsulated).

## Recognition Cards (2007)

***Invasive and Non-Native Plants You Should Know*** — A 4” x 6” photographic plant identification deck featuring 80 plant species currently being controlled on Florida public lands and waters. Individual cards feature large, full color photographs on the front side to help with visual recognition, as well as helpful information on the back about the plant’s appearance (leaves, flowers, and fruit). Plant distribution, ecological threat information and field codes are provided (i.e., as requested by field biologists). The set is bound with a removable ring that allows cards to be added, removed or reorganized as needed. All sets include an index in the front section with plants listed by both common and scientific names; a text glossary of botanical terminology; an illustrated glossary; and a bibliography. Space is even provided for writing field notations with dry erase pens. *NOTE: Regional sets were also created at the request of state park biologists who wanted a field sets for their region (NW, NE, C, SW, SE).*

**FLASH CARDS (2007)** *Invasive and Non-Native Plants You Should Know* — Based on teacher suggestions, we were able to take the Recognition Cards described above and turn them into a set of invasive plant flash cards simply by removing the plant names off the front of each plant ID card. For use in the classroom (or by anyone wanting to “quiz” themselves on Florida’s worst invasive plant species).

**Freshwater Plant BINGO!** (2006-07) – An example of implementing teacher ideas: We



were able to utilize 174 botanical line drawings (assembled by CAIP over the years) and turn them into a hands-on plant identification activity for use in the classroom. As one teacher wrote to us recently, after using the game in her classroom... “It was an amazing teaching moment.”

**Freshwater Plant Jigsaw Puzzles** (2005-06) – 14” x 20” in size. Another example of implementing teacher ideas: We were able to utilize CAIP’s Freshwater Plants poster (i.e., created several years prior), and turn it into a hands-on plant identification activity for use in the classroom. Teachers from upper elementary to high school level have been utilizing this activity. In fact, it was so popular that we had to reprint them again this year. Classroom sets of six puzzles are being provided to teachers,

## Freshwater (artificial) Plant Kits (2007-08) –

A collection of 10 artificial plants have been assembled into classroom kits for teachers who attend our summer PLANT CAMP workshops. Again, this is in response to requests from teachers who said they don’t always have the capability to take their students outdoors. Both native and invasive, non-native plant species are included in the kits: *Cabomba*, frog’s bit, *Hydrilla*, *Hygrophila*, *Ludwigia*, *Limnophila*, *Vallisneria*, water hyacinth, water lettuce, and water lily.

**Teacher Kits** (2006-07) – Participants of the annual PLANT CAMP are bolstered with a classroom “tool kit” that contains all kinds of activities and resources to use for teaching their students about native and invasive non-native plants. Items include: a botany handbook and illustrated glossaries of leaf shapes, flower parts, root systems, etc; Florida LAKEWATCH publications for information on the water chemistry side of things; BINGO games, Freshwater Plant Puzzles, classroom sets of pencils and magnifying lenses; and a collection of aquatic plant management videos (DVD format).

**Teacher Notebooks** (2005-08) – For four years now, we’ve been assembling and distributing notebooks with sample curricula and resource materials for teachers, including the four core lessons/modules on DVD. More than 400 notebooks have been given to teachers at various workshops and outreach events throughout Florida.



Basf 4 color p/u  
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# Showcase on the Saint Lucie West Aquatics Program

## Ken Gioeli

Natural Resources Extension Agent  
University of Florida IFAS -  
Saint Lucie County Cooperative Extension

## Ken Langeland

Professor  
University of Florida IFAS,  
Center for Aquatic and Invasive Plants

## Bill Hayden

Assistant District Manager and  
Director of Public Works  
Saint Lucie West Services District

## Lorri Bush

Aquatics Division Supervisor  
Saint Lucie West Services District

## Introduction

Saint Lucie West is a relatively new community on southeast Florida. The Saint Lucie West Services District is organized as a Community Development District with its own elected public officials within the boundaries of the City of Port Saint Lucie. The District services approximately 7,000 customer properties and the community has a population of 25,000 residents. Prior to October 2007, all aquatic maintenance performed on District lakes and ponds was contracted out to a private contractor. Because of the long turn-around time for the contractor to take care of service calls, and the dissatisfaction of service that the District was receiving, it was decided to bring the entire aquatic plant retention-pond maintenance program "in house."

The Saint Lucie West Services District is managed by John Imperato, District Manager, and Bill Hayden, Assistant District Manager and Director of Public Works. Lorri Bush is the Supervisor of the

Aquatics Crew which is a division of Public Works.

This interview was conducted by Ken Gioeli, the University of Florida / IFAS Natural Resources Extension Agent for Saint Lucie County. Lorri Bush shares her experiences as Aquatics Supervisor.

## Questions and Answers

**Ken Gioeli (KG):** "Lorri, thank you very much for taking time this morning to talk with me about the Saint Lucie West Aquatics Program."

**Lorri Bush (LB):** "Oh, you're very welcome."

**KG:** "How long have you been managing aquatic plants in St Lucie West?"

**LB:** "I've been with the District for 3 ½ years now – right about the time the District took over and started maintaining the retention ponds."

**KG:** "How many lakes and acres do you manage?"

**LB:** "We manage 128 ponds and it is about 650 acres."

**KG:** "How many people work on the Saint Lucie West Aquatics Crew?"

**LB:** "There are four spray techs, one lead spray tech and myself as the manager."

**KG:** "Is there anything you'd like to share about your background and credentials?"

**LB:** "When I was hired, I was required to get my aquatics license and my right-of-way and then I completed the Master Naturalist freshwater wetland module."

**KG:** "So education is important to you."

**LB:** "Oh, absolutely! Absolutely!"

**KG:** "I agree."

**KG:** "How much does the District spend on aquatic herbicides per year?"

**LB:** "Yeah, we've budgeted for \$125,000 this year for chemicals."

**KG:** "Do you have permitted littoral zones and are they required as part of a mitigation program?"

**LB:** "Yes they are as per the South Florida Water Management District."

**KG:** "So when Saint Lucie West was developed, the Water Management District required wetlands mitigation, so you have retention ponds with littoral zones as well as upland buffers. What are the biggest aquatic weed problems you encounter?"

**LB:** "Probably right now, our biggest problems are Torpedograss and Alligatorweed. When the District took over the management of these retention ponds, Hydrilla was the major problem. Since then, we've used Sonar and got that issue under control. One thing I've noticed is that as soon as we get one weed under control, something else becomes a problem. Its like one action creates a reaction."

**KG:** "That's ying and yang. Have you noticed any fluridone-resistance in Hydrilla?"

**LB:** "No. This is our second year using fluridone. It still seems to be doing a good job on the Hydrilla."

**KG:** "Is Tape grass a problem?"

**LB:** "Oh that is my biggest issue."

**KG:** "Is it a seasonal problem?"

**LB:** "It seems to be [a bigger problem] in the warmer months. It sheds itself and we have to use the harvester to remove it. We've educated the customers about Tape grass and they're becoming more understanding. They see the harvester in the lakes constantly trying to maintain it. Education is a big, big thing for us."

**KG:** "If so, what plantings would you use instead of the Tape grass?"

**LB:** "I would like to plant aquatic plants around the pond like pick-erelweed, duck potato, and other

native pond plants. But some of the homeowners don't want to see any of these plants in the ponds.'

**KG:** 'Maybe some of the readers of this article can recommend some viable alternative plantings.'

**LB:** "Absolutely."

**KG:** "Do you and your aquatics crew members have pesticide licenses?"

**LB:** "My lead spray tech, Searg, has his aquatics license and right-of-way and Dominick's got his aquatics license. I'm urging everybody on the aquatics team to get their aquatics license."

**KG:** "The nice thing about having a licensed crew is that it makes it a professional operation."

**LB:** "Absolutely!"

**KG:** "What aquatic herbicides do you commonly use?"

**LB:** "We use Rodeo. Habitat is a good one for alligator weed. Chem 1 and Cutrine for algae. Reward for the smaller floating plants like duck weed, mosquito fern, water lettuce."

**KG:** "Are there any tricks of the

trade that you'd like to share?"

**LB:** "Employee training is critical. We have reduced liability because people are using these products more effectively."

**KG:** "Please describe your record-keeping system."

**LB:** "We have a daily management report that we fill out right down to the ounces of chemicals that we use. Then we do a monthly report based on these daily reports. We put everything on record. We record everything required by law as well as the lake number, dissolved oxygen level, equipment we're using, what weed is being controlled, chemical used, and amount."

**KG:** "It looks pretty thorough to me. Do you provide public education to teach the community about the work you do?"

**LB:** "We will attend the HOA meetings on request. I will also always meet up with individual homeowners who call us about pond issues and I will explain to them what we can do. A lot of people call us about club rush. I have to go out and explain to them that there is not

much we can do about club rush and that it is a native plant and its there for a reason."

**KG:** "It would be really nice to have a picture and posters with a dragonfly perched on a club rush to show people."

**LB:** "Oh yeah. Its good habitat."

**KG:** "Do your HOA's have a fertilizer program? Please describe."

**LB:** Yes they do. They do not fertilize from the top of the slope down to the edge of the water. They are specially designed programs for each HOA according to their soil sampling. The homeowners associations follow Green Industries Standards."

**KG:** "Please describe your wetland buffers management program."

**LB:** "Yes. We have team dedicated to the purpose of removing exotic vegetation such as Brazilian pepper and melaleuca. They are a separate team from the aquatics crew. Brazilian pepper removal is a year-round job."

**KG:** "Please describe the aquatic midge problem and how the District has dealt with it."

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**LB:** As far as the midges go, they don't seem to be as prevalent as when we first took over the management of these ponds. Homeowners' screens used to be just covered in these little midges. Obviously people weren't thrilled with it, so we used a product called Strike."

**KG:** "So you monitor the lakes for midges?"

**LB:** "Yes we do and homeowners will call in a complaint if they are becoming a problem. We can use Strike as needed."

**KG:** "So not only are you using Strike and monitoring for midges, but are you also using insect-eating fish and other techniques?"

**LB:** "Yes. We stock the ponds with fish. The plan we have implemented has worked. The midges are not as prevalent as when we first took over management."

**KG:** "Do you use grass carp and if so, are they effective?"

**LB:** "We have two lakes that have grass carp in them. They seem to be somewhat effective with the stemmed vascular plants. I would love to see how effective they are on the Tape grass."

**KG:** "Do you have exotic fish problems? If so, how do you deal with it?"

**LB:** "I haven't seen any except we do have tilapia. We do get walking catfish. I saw your article on jack demseys and I'm keeping a lookout for them."

**KG:** "What do you have on your wish list?"

**LB:** "To try a small pond stocked with grass carp to see how well they do managing the Tape grass. We're looking into it."

**KG:** "Do you work closely with the University of Florida/IFAS Extension office in St Lucie County? If so, how?"

**LB:** "Working with you, Ken, anything unusual that arises that I can't manage myself, I call you. You and Ken Langeland have been out to help with the shedding Tape grass issue. Working closely with you on

classes and getting people licensed."

**KG:** "Is there anything that you'd like to add before we wrap up this interview? Is there any equipment you'd like to talk about?"

**LB:** "Let's talk about the harvester. The harvester is basically used for "mowing" the pond."

**KG:** "Good. I'm glad you remembered. Please describe the harvester."

**LB:** "It's a modified pontoon boat with paddles. The harvester has moving teeth on the front. It paddles along the water and picks up any floating vegetation. We first started using it for Hydrilla. We use it for Tape grass and other vegetation now. It mows the pond and the vegetation is put on a conveyor belt which hauls it out of the pond on a trailer."

**KG:** "Is there a name for it?"

**LB:** "It's called the "Aquatic Queen" but the guys don't like the name. I don't know what they want to name it."

**KG:** "I think they should paint it pink and name it the *Aquatic Princess*."

**LB:** "Absolutely not," she said as they both laugh. "I think we're going to be painting it St Lucie West colors – green and gold."

**KG:** "What are the main advantages to using the harvester?"


**LB:** "It reduces the herbicide use. It has been phenomenal with this floating Tape grass problem."

**KG:** "Well, Lorri, as always, it has been a pleasure working with you and the folks at the St Lucie West Services District. I appreciate your time."


**LB:** "Thanks, Ken"

For additional information, please contact Ken Gioeli, University of Florida / IFAS Natural Resources Extension Agent for Saint Lucie County. He can be reached at (772) 462-1660 or [ktgioeli@ufl.edu](mailto:ktgioeli@ufl.edu).

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# Aquatic and Invasive Plant Website Updated

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

**By Karen Brown**  
University of Florida-IFAS Center  
for Aquatic and  
Invasive Plants

After being online for more than twelve years, the University of Florida's IFAS Center for Aquatic and Invasive Plants website was in need of a major overhaul and update. The underlying framework and organization of the original website was outdated and lacking the technology that is now available for improved navigation, delivery and appearance. Literally thousands of web pages that had been created over the years had to be reformatted and transferred to the new site by web specialist Elizabeth Hathaway. This summer, the newly refurbished website went online and it definitely deserves a revisit by those who have not taken a recent look.

### Identification Videos Online

In addition to the new format, a major enhancement has been the addition of 120 aquatic plant identification video segments to the CAIP website. These segments were completed as a video series in the late 1990s, and last year were

*"This summer, the newly refurbished website went online and it deserves a revisit by those who have not taken a recent look."*

transferred from S-VHS to digital DVD format. This year, each individual segment was uploaded to the respective Plant Information & Images pages (see the Navigation Bar on the left side of the home page). Each 2-3 minute identification video is narrated by Dr. Ken Langeland with the CAIP. They can be easily viewed using any Internet browser with a high-speed connection. Look for the video icon next to plant names in both the scientific names list and the common names list.

### The following plant species now have video ID sequences on the CAIP website:

*Alternanthera philoxeroides* — alligator weed  
*Andropogon glomeratus* — bushy beardgrass  
*Azolla caroliniana* — Carolina mosquito fern  
*Bacopa* species — bacopa  
*Bidens laevis* — bur marigold  
*Brasenia schreberi* — water shield  
*Cabomba caroliniana* — fanwort  
*Canna flaccida* — golden canna  
*Cephalanthus occidentalis* — buttonbush  
*Ceratophyllum demersum* — coontail  
*Ceratopteris thalictroides* — water horn fern  
*Chara* species — muskgrass  
*Cicuta mexicana* — water hemlock  
*Cladium jamaicense* — saw-grass  
*Crinum americanum* — swamp lily  
*Cyperus distinctus* — distinct sedge  
*Cyperus odoratus* — flat sedge  
*Decodon verticillatus* — swamp loosestrife  
*Egeria densa* — common waterweed  
*Eichhornia crassipes* — water hyacinth  
*Eleocharis baldwinii* — road-grass  
*Eleocharis cellulosa* — club rush  
*Eleocharis interstincta* — giant spikerush  
*Fimbristylis spathacea* — hurricane-grass

*Fuirena scirpoidea* — rush fuirena  
*Fuirena squarrosa* — lake rush  
*Habenaria repens* — water-spider orchid  
*Hydrilla verticillata* — hydrilla  
*Hydrocotyle* species — pennyworts  
*Hygrophila lacustris* — hygrophila  
*Hygrophila polysperma* — East Indian hygrophila  
*Hypericum* spp. — St. John's- wort  
*Ipomoea aquatica* — water spinach  
*Iris virginica* — blue flag  
*Juncus effusus* — soft rush  
*Juncus marginatus* — shore rush  
*Juncus roemerianus* — black or needle rush  
*Lachnanthes caroliniana* — redroot  
*Lachnocaulon* species — bog buttons  
*Leersia hexandra* — southern cutgrass  
*Lemna valdiviana* — duckweed (small)  
*Limnobium spongia* — frog's bit  
*Limnophila sessiliflora* — limnophila  
*Ludwigia repens* — red ludwigia  
*Ludwigia* species — water primrose  
*Luziola fluitans* — water grass  
*Mayaca fluviatilis* — bog moss  
*Micranthemum* species — baby's tears  
*Myriophyllum aquaticum* — parrot feather  
*Myriophyllum heterophyllum* — variable-leaf milfoil

*Myriophyllum laxum* — loose watermilfoil  
*Myriophyllum spicatum* — Eurasian water-milfoil  
*Najas guadalupensis* — southern naiad  
*Nelumbo lutea* — American lotus  
*Nitella* species — stoneworts  
*Nuphar advena* — spatterdock  
*Nymphaea mexicana* — yellow water lily  
*Nymphaea odorata* — fragrant water lily  
*Nymphoides aquatica* — banana lily  
*Panicum hemitomon* — maidencane  
*Panicum repens* — torpedograss  
*Paspalum repens* — water paspalum  
*Peltandra virginica* — arrow arum  
*Pennisetum purpureum* — napiergrass  
*Phragmites australis* — common reed  
*Pistia stratiotes* — water lettuce  
*Polygonum* species — knotweed  
*Pontederia cordata* — pickerelweed  
*Potamogeton illinoensis* — Illinois pondweed  
*Potamogeton pectinatus* — sago pondweed  
*Potamogeton perfoliatus* — clasped pondweed  
*Proserpinaca palustris* — mermaid weed  
*Rhynchospora inundata* — inundated beak-rush  
*Rhynchospora nitens* — bald rush  
*Rhynchospora tracyi* — Tracy's beak-rush  
*Sacciolepis striata* — American cupscale grass  
*Sagittaria graminea* — grassy arrowhead  
*Sagittaria kurziana* — strap-leaf sagittaria  
*Sagittaria lancifolia* — duck potato  
*Sagittaria latifolia* — broadleaf or common arrowhead  
*Sagittaria subulata* — awl-leaf arrowhead  
*Salvinia minima* — water fern  
*Sambucus canadensis* — elderberry  
*Saururus cernuus* — lizard's tail  
*Scirpus cubensis* — burhead sedge  
*Scirpus pungens* — common three-square bulrush  
*Scirpus robustus* — salt-marsh bulrush  
*Scirpus validus* — soft-stem bulrush  
*Sparganium americanum* — bur-reed  
*Spartina bakeri* — sand cordgrass  
*Spirodela polyrrhiza* — duckweed (giant)  
*Thalia geniculata* — fireflag  
*Typha* species — cat-tails  
*Urochloa maxima* — Guinea-grass  
*Urochloa mutica* — para grass



*Utricularia gibba* – cone-spur bladderwort  
*Utricularia purpurea* – purple bladderwort  
*Utricularia* species – bladderworts  
*Vallisneria americana* – tape grass  
*Wolffia gladiata* – bog mat  
*Xyris* species – yellow-eyed grasses  
*Zizania aquatica* – wild rice  
*Zizaniopsis miliacea* – giant cutgrass

## Upland Invasive Species in Natural Areas

A new series of identification videos on Florida upland invasive plant species was begun in 2007-2008. Six segments were produced and have been uploaded to the **Plant Information and Images** pages for viewing:

*Ardisia crenata* – coral ardisia  
*Sapium sebiferum* – Chinese tallow  
*Imperata cylindrica* – Cogongrass  
*Lygodium microphyllum* – Old World climbing fern  
*Paederia foetida* – skunk vine  
*Ruellia brittoniana* (syn. *R. tweediana*) – Mexican petunia

## Invasive Species Management Plans

Another important and valuable addition is material from the **Invasive Species Management Plans** for

**Florida** (Circular 1529, 2008) written by Drs. Greg MacDonald, Jay Ferrell, Brent Sellers, Ken Langeland, and others from the University of Florida-IFAS Agronomy Department and Extension Service. The plans were developed jointly through UF/IFAS and the Florida Division of Forestry. These plans also are found on the **Plant Information & Images** pages of the CAIP website. For each species, information is provided on proper identification, impacts and management. There are also sections detailing the herbicides recommended for control, and application techniques required for each species. Additionally, there is a herbicide response table that gives the relative effectiveness of several herbicide treatments on those species included.

To review other information presented at the CAIP website, including the comprehensive **Plant Management in Florida Waters** guide (<http://plants.ifas.ufl.edu/guide>), the ever-expanding **APIRS Data-**

**base** (now with more than 72,000 references), the **Invasive Plant Education Initiative**, the **Osceola County Hydrilla and Hygrophila Demonstration Project**, and more, please visit <http://plants.ifas.ufl.edu>. We think you'll like what you see.

The UF/IFAS CAIP website has been supported since its inception by the Florida Department of Environmental Protection, Bureau of Invasive Species Management, now under the direction of the Florida Fish and Wildlife Conservation Commission, Invasion Plant Management Section. We greatly appreciate their support of all the educational efforts of the CAIP Information Office.

For more information, contact Karen Brown at the UF/IFAS Center for Aquatic and Invasive Plants, 7922 NW 71<sup>st</sup> Street, Gainesville, Florida 32653 – 352/392-1799 – [CAIP-website@ufl.edu](mailto:CAIP-website@ufl.edu)

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## AQUAVINE

### New FAPMS Logo Selected

The FAPMS logo contest has ended. Art work submitted by Ryan Moore was selected to be the new logo by a majority vote at the 32<sup>nd</sup> Annual FAPMS Conference. Ryan received \$500 cash award and recognition for his art work.

Congratulations Ryan! As a side note: less than 3% of the membership voted to keep the existing "head and Erlenmeyer flask" FAPMS logo.



### Hydrilla in Massachusetts

Acting on a tip from a concerned citizen, biologists from the Massachusetts Department of Conservation and Recreation (DCR) Lakes and Ponds Program, recently confirmed that Hobomock Pond in Pembroke, MA is heavily infested with Hydrilla (*Hydrilla verticillata*). To date, hydrilla has been documented to occur at only one other Massachusetts location; in a pond in Barnstable. While the infestation in Hobomock Pond is obviously bad news, the good news is that the discovery is the result of a successful monitoring initiative. The Hydrilla was found by a volunteer who had been trained through DCR's Weed Watchers Program. For more information about Massachusetts's rapid response plan for Hydrilla in the Commonwealth, please visit the website: [www.mass.gov/dcr/water-Supply/lakepond/rapidresponse-plans.htm](http://www.mass.gov/dcr/water-Supply/lakepond/rapidresponse-plans.htm)

Submitted by Karen Brown, UI/IFAS Center for Aquatic and Invasive Plants

### Western Aquatic Plant Management Society 2009 Scholarship Deadline Soon

The Western Aquatic Plant Management Society (WAPMS) is pleased to announce the 2009 Barbra H. Mullin Memorial Scholarship in the amount of \$1,000 to support students in the pursuit of a degree in aquatic sciences. All application materials should be submitted electronically to the WAPMS Scholarship Program Chair, Toni Pennington ([toni.pennington@tetrattech.com](mailto:toni.pennington@tetrattech.com)), by February 20, 2009 at 5:00 (PCT).

To be eligible, applicants must be currently; 1) enrolled as a full-time undergraduate or graduate student in an accredited college or university in the western United States and 2) engaged in course work or research related to the biology, ecology, management, or education of aquatic plants. Please visit the website at: [www.wapms.org](http://www.wapms.org) or contact Toni Pennington, Ph.D., Aquatic Biologist, Surface Water Group. 503.223.5388 ext. 115. Fax: 503.228.8631 email: [Toni.Pennington@tetrattech.com](mailto:Toni.Pennington@tetrattech.com)

## Calendar

### January 19-21, 2009

Northeast Aquatic Plant Management Society 10<sup>th</sup> Annual Conference  
Gideon Putnam Resort, NY  
[www.neapms.net](http://www.neapms.net)

### February 17-19, 2009

29<sup>th</sup> Annual Symposium - FL Chapter of the American Fisheries Society  
4H Camp Ocala, FL  
[www.sdafs.org/flafs/](http://www.sdafs.org/flafs/)

### March 31- April 2, 2009

6<sup>th</sup> Arbovirus Surveillance and Mosquito Control Workshop  
Holiday Inn. St. Augustine, FL  
[www.anastasiamcd.org/education%20nav.htm](http://www.anastasiamcd.org/education%20nav.htm)

### May 26-29, 2009

FLEPPC's 24<sup>th</sup> Annual Symposium  
Delray Beach, FL  
[www.fleppc.org/Symposium/2009/](http://www.fleppc.org/Symposium/2009/)



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