Aquatics

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Say Cheese! One man's weed is another man's art supplies… Deer head mount made from waterhyacinth (*Eichhornia crassipes*). Photo courtesy Lyn Gettys, UF/IFAS

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The mission of FAPMS is "To Preserve Florida's Aquatic Heritage." FAPMS was formed in 1976 and provides a forum for those interested in aquatic plant management to meet, discuss and exchange ideas and information.

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6 Simple Rules for Discussing Herbicide Efficacy

by Stephen Enloe

I was at a meeting the other day and I came upon a conversation between three folks – two seasoned professionals and a newcomer to the field of aquatic plant management. I would like to share a little bit of the conversation here, as I believe it will help get my message across. I have changed the names of the people, weeds, and herbicides to protect the guilty parties. It went something like this:

Joe: "Hey, did you hear about triclomazafluroquat? That stuff is fantastic on Gettysweed!"

Bob: "Really? We tried it on Hallerweed but it didn't work. Nothing kills that stuff."

Newbie: "Triclomazafluro-what?"

Joe: "We doused a big patch of it down on the lake. Nuked it good."

Bob: "Good to hear it works on Gettysweed. That weed has been giving us trouble for about three years now."

Newbie: "Hey, what rate of tricloquat did you guys…"

Joe: "We threw some of that new surfac-

Figure 1. Looking for triclopyr? With several product names and formulations available, it is critical to get the correct one for the job.

tant in there and that really heated it up too."

Bob: "Yeah, that stuff is awesome. We add it to almost every treatment now."

Newbie: "Surfactant? Wait, which one did you…"

Joe: "We loaded up the bird and rained it down like fire across that patch. We had some airboats getting after it in the coves. That was tough going getting back in there."

Newbie: "Huh? How did the airboats do the treat…"

Joe: "That stuff works best if you let the weed really get cranking. But you can't wait too long or you will never get to it all."

Newbie: "Wait! Do you mean with the airboat or the bird?"

Bob: "Especially back in the coves along the cypress heads, where it goes gangbusters, right?"

Joe: "You got it."

Newbie: "Cypress? You aerially sprayed across the cypress? I am confused!"

Joe: "I went out last week and that stuff was just gone. I couldn't find it anywhere. The fishermen were happy with the treatment. Triclomazafluroquat is definitely in our future work!"

Bob: "Yep."

Newbie: "Triclomazafluro-what?"

<end of conversation>

This conversation and many variants of it have played out innumerable times over my career. A lot of the details of herbicide efficacy often go unmentioned in water cooler conversations. This often works for the veterans who know how each other operate, but for the new kid, this is a nightmare. With that in mind, professionalism is of utmost importance when discussing herbicide efficacy. We are moving into an unprecedented era as baby boomers retire and lesser experienced folks take the reins. When talking herbicide efficacy, you don't need to pretend you are at a starch-collared, coat-and-tie weed science conference. But if you follow these six simple rules, you can greatly improve the conversation, especially for the inexperienced.

RULE #1. Provide the herbicide product name. In a world where product names are getting more and more bizarre and common herbicide names are now routinely used as generic trade names, it is more important than ever to clearly communicate what product you are using. This includes the formulation and manufacturer too. Why? Here is the reason: go and Google "Triclopyr products". You will find no less than a dozen triclopyr products and formulations, many of which will NOT be the one you need. If you think that's a lot, try glyphosate or 2,4-D. The bottom line is this: the product name leads you directly to the herbicide label, which is the legally binding document that you must follow. The formulation is important too. If you are discussing a granular 2,4-D product, make sure to mention that is indeed a granular formulation.

Now, this is coming from a university guy, and you might be wondering why so many university researchers only speak in common or chemical names… That's a good question, and here is the answer. Historically, many products came and went and herbicide active ingredients often got a new name or were added into new premixes. Universities have generally shied away from recommending product names due to the perceived conflict of interest of recommending one company's products over another. Land grant universities strive to provide unbiased, science-based recommendations and the common herbicide name was the easiest way to do that. Now that common herbicide names are routinely used for generic products, many universities have relaxed on this issue and provide a disclaimer in the fine print at the bottom of the page.

Rule #2. Specify the herbicide rate or concentration applied. This is an absolutely critical piece of information, as herbicide efficacy and selectivity are often highly rate specific. This entails specifying the amount of product applied per area for broadcast treatments, the percent solution applied for spot treatments (do not forget to include the application volume), and the herbicide concentration for submersed aquatic vegetation (SAV) treatments. One confusing aspect of herbicide rate and concentration is that they are often expressed on a product basis in some cases and on an active ingredient or acid equivalent basis in others. Triclopyr again is a great example of an herbicide active ingredient where product and active ingredient rates are commonly discussed. For ground or aerial broadcast treatments, triclopyr products are discussed as the volume of product applied per acre. For upland individual plant treatments or floating or emergent spot treatments, triclopyr products are expressed as the volume of product added to the spray tank on a percent volume to volume basis. For submersed treatments, triclopyr products are discussed on a concentration basis in parts per million or parts per billion of triclopyr acid equivalent. Again, these calculations are not rocket science, but if you do not clarify rate or concentration, NO ONE can really know what you applied. And if you can't tell people how much you applied, you might be in the wrong business.

RULE #3. Disclose any adjuvants added. Adjuvants fall under several categories and have very specific roles. These include surfactants, wetting agents, stickers, spreaders, buffering agents, acidifiers, anti-foaming agents and more. Not all adjuvants are labeled for use on all sites. This is especially true between adjuvants for terrestrial and aquatic applications. Many herbicides require adjuvants for maximum effectiveness and certain herbicides perform very poorly when no adju-

vants are used. A classic example of this is aquatic glyphosate products (several trade names), which may fail when no adjuvants are added.

RULE #4. State the method of application. This may seem like a given in most cases, but don't assume that it is. Many professionals now routinely do a mix of submersed, floating, emergent, and terrestrial invasive plant control. A high-volume handgun foliar application is not the equivalent of a low-volume backpack foliar application, and both are a far cry from an aerial application. This confusion is compounded for herbicides used across sites with different application techniques. Again, triclopyr is a perfect example of an

Figure 2. Not all application methods are created equal. Make sure the application method is clear when discussing herbicide efficacy!

herbicide active ingredient that is labeled for use in ALL of these settings, but the specific products and application methods can vary greatly. Many new applicators still frequently confuse the triclopyr amine and ester formulations and the application techniques. One works well for basal bark treatment (ester) and the other (amine) does not. Another triclopyr formulation (acid) is actually labeled for both. Failing to provide this information at the water cooler has led many applicators to triclopyr failure, simply because they were using the wrong product.

Figure 3. The abundance and growth stage of the target can greatly affect treatment outcomes. Mosquitofern is relatively easy to control, but heavy infestations almost always require follow-up treatment. Failure to convey this information can lead to the wrong expectations and poor results.

Figure 4. This patch of cogongrass was treated 11 months prior to the photo. Although the dead shoots look great, a little digging will quickly show how good control really is (or isn't!)

RULE #5. Explain the target weed's growth stage and abundance. Across aquatic and terrestrial invasive plants, most species exhibit strong seasonality in growth. Seasonality of growth can strongly impact herbicide efficacy through changes in biomass abundance and shoot density or physiological changes such as altered resource allocation to shoots or roots. For example, a fluridone (Sonar) treatment applied to topped-out, very dense hydrilla in midsummer may result in poor control, while the same treatment applied in late winter when hydrilla growth is limited may be very effective. Or, conversely, a cut stump, hack and squirt or foliar treatment of imazamox (Clearcast) on Chinese tallowtree in early spring may perform poorly, while the same treatment in fall is extremely effective. In early spring, tallowtree mobilizes stored energy for new leaf production, so this is a bad time to try to get herbicides down to the roots. In Florida, professional applicators treat many weed problems twelve months a year out of necessity, despite these seasonal differences. This mandates a good understanding of the target weed's biology and growth patterns, especially in relation to the herbicide applied. Failure to communicate this biological information can lead to applicators experiencing very variable control with products whose efficacy can be season-specific.

RULE #6. Provide the criteria for evaluation after treatment. Herbicide efficacy, also called herbicide effectiveness, is the single most important factor most applicators use when selecting a product from the suite of available choices. It has to work, or why bother applying it? Efficacy, however, has a temporal component often ignored when discussing treatments and it is frequently system- and herbicide-specific. For example, contact herbicide treatments such as diquat that are used for free-floating plants are generally effective in just a few days. Thus, short-term evaluations are very appropriate and long-term evaluations may actually be misleading. Apply the same material to torpedograss and the short-term evaluation will be the one that is misleading. Furthermore, short-term efficacy evaluations of systemic, slow-acting herbicides are also of limited value. Torpedograss and many woody species may not show any symptoms after imazapyr treatments for several weeks or months. This may result in perceived treatment failure and the applicator may erroneously feel the need to retreat quickly, when all that is needed is a little patience.

Conclusions. Not every conversation I run into is as bad as what I recounted at the beginning of this story and most applicators do communicate this information well. But many are lacking in at least some of these fundamentals, by which we properly judge herbicide efficacy. So, the next time you see Joe and Bob at the water cooler, make sure you pry a little more information out of them. You never know who else might be listening!

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Working in the Public Eye

by Stephen Montgomery

It's never easy to do a job with someone watching over your shoulder. Someone is always interrupting your train of thought, asking questions, and criticizing what you're doing. As an aquatic applicator, if this hasn't happened to you, you're probably a "newbie" and it's a matter of time before you're in this position. Therefore, this is more a question of: *How do I handle this when it happens?* rather than: *What do I do if it happens?* This is partly because the waterways where we work are an integral – and visible – part of everyday life in Florida. The focus on aquatic recreation, the abundance of waterfront homes and the importance placed on our stormwater management needs puts aquatic applicators in the public eye on a daily basis.

"How do I handle this when it happens?"

One would think our industry would benefit from the increase in public concern for the environment. We are, after all, maintaining our aquatic resources to promote their function, sustainability and aesthetics. Unfortunately, the "green movement", combined with a lack of public knowledge about aquatic weed management, can accidentally create an adversarial attitude toward applicators and the work we do. This issue is compounded by a steady flow of misrepresented information through the media and internet. For example, generalizations about the "evils of chemicals in the environment" has translated to a mistrust of anyone using them, regardless of the situation.

It's not likely that a spontaneous, widespread change in peoples' understanding will happen any time soon. We need to be prepared to deal with individuals that may voice disapproval with our work, and take an active role in educating them. Over the years I've learned some basic guidelines and tactics to follow when speaking to the public while on the job. These include:

- ***Be polite*** – This should be common sense, but that's easier said than done when you're halfway through a long day in the middle of August. Before you get too involved in any conversation, take a second to compose yourself. Being argumentative will not help a situation and does not present you as an experienced professional. You should be confident in your answers but not condescending to the person you're speaking with.

- ***Understand their point of view*** – Sometimes people are just curious about what you're doing. Most people don't have the familiarity with your job that others in our field do. For example, you see PPE as an uncomfortable but necessary part of your job, but when citizens see you wearing PPE, they become concerned about their safety. Keep in mind that the average person's knowledge about aquatic herbicides is probably confined to something they read on Facebook last week. Remember you are working near where they and their families live and play. People tend to fear what they don't understand. Take that into consideration when approached by concerned residents.

- ***Choose your words*** – Correct terminology can help to clear up public misconceptions about our job. Words like "chemical" and "killed" are ambiguous and create a sense of fear. Explaining that we only use herbicides approved for use in the water, and that specific weeds are targeted for treatment, helps to convey a better image. It's important to show the public that aquatic vegetation management is very careful and deliberate, and does not include reckless use of random chemicals. Our choice of words when communicating with the people we come into contact with is a big part of that process.

- ***Establish a connection*** – Most residents and homeowners don't realize how important aquatic vegetation management is here in Florida. Establishing a connection between what we do and the benefits to their lives demonstrates that applicators are working on their behalf. Explaining how successful vegetation management programs maintain flood control systems

and recreational waters, while improving aesthetics of communities, shows them they have a vested interest in what we do.

• ***Make the weeds the bad guy*** – The years and years of hard work and environmental success go unnoticed, but the rare mistake gets instant attention. Applicators often get swept up in the fervor to "save the environment" and assign blame to careless offenders. In the rush to put a face to environmental damage, it's often overlooked that **the weeds are the bad guys here**. The amount of habitat and income lost due to exotic plant species rarely makes the headline news. The invasive nature of weeds is often not apparent to residents because our efforts are focused on keeping invasions at bay (usually without their knowledge). Educating residents on the plants we target and the damage they're capable of inflicting can improve public support for our work.

> ***"We work hard to ensure that the job gets done right and Florida's waterways are protected. Don't be afraid to let people know it."***

• ***Know when to leave*** – Despite your best efforts, some people are just not interested in having their minds changed. Some folks are going to cling to their preconceived notions tighter than a drowning person clings to a life preserver. Being polite and professional doesn't mean you have to stand there being berated by a belligerent individual. If their mind is made up, then trying to convince them to see another viewpoint will probably only aggravate them more. That's why it's important to recognize when a situation won't be resolved in the moment and politely make your exit. Let them know that their concerns are heard and understood and give them the contact information for a supervisor or customer service department. Business cards and printed informational materials can often help make a transition to exiting a conflict. When you return to your office, be sure to follow up with the appropriate people so that they know to expect a call and what the situation is so they aren't blindsided.

As aquatic resource managers in Florida, we sometimes have to be our own public relations department. Avoiding confrontation at any cost only perpetuates the misconception that we're doing something wrong. A little explanation can go long way toward fostering a broader understanding of our job and its necessity. It's important that we don't take criticism of what we do personally, particularly since it is often misinformed. We make an effort to get licensed and stay trained. We work hard to ensure that the job gets done right and Florida's waterways are protected. Don't be afraid to let people know it.

Stephen "Monty" Montgomery (smontgomery@allstatemanagement.com) is a Senior Biologist with Allstate Resource Management in Davie, Florida.

"Invasives in Action" Swamp Tour

Figure 1. Gator in the swamp... Photo courtesy Tina Martinez, UF/IFAS.

by Lyn A Gettys

Ah, to be in a Louisiana swamp in the summertime… hot, humid, and a heck of a lot of fun!!! That's where we were on the morning of August 6, where we led an "Invasives in Action" swamp tour for a select group of folks attending the American Society for Horticultural Science (ASHS) annual meeting in New Orleans. The tour was hosted by the ASHS Invasive Plants Research Working Group and was sponsored by the Aquatic Ecosystem Restoration Foundation (AERF), a non-profit foundation that is committed to sustainable water resources through the science of aquatic ecosystem management in collaboration with industry, academia, government and other stakeholders.

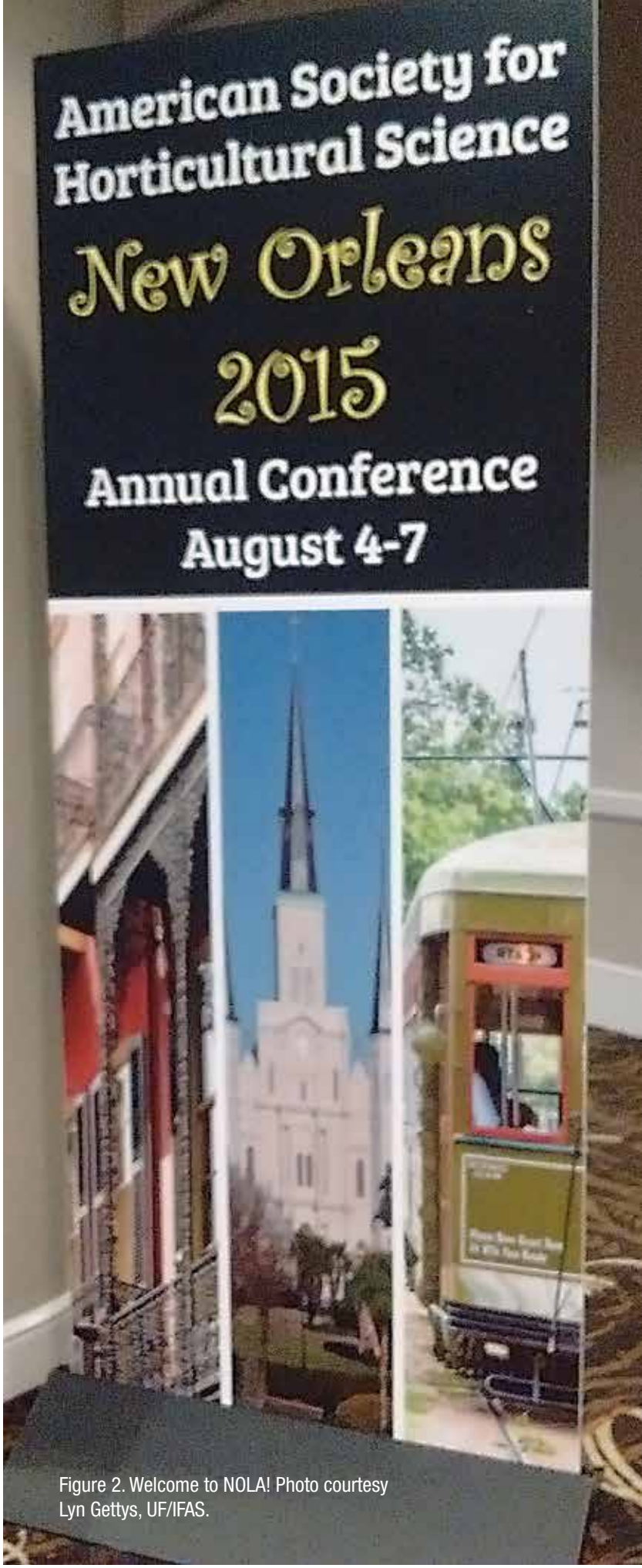

Figure 2. Welcome to NOLA! Photo courtesy Lyn Gettys, UF/IFAS.

Figure 3. Tour attendees pontoon-boating into the swamp. Photo courtesy Lyn Gettys, UF/IFAS.

The tour was operated by the Louisiana Tour Company, which picked us up on Canal Street in downtown New Orleans and transported us to the Jean Lafitte National Historical Park and Preserve in Marrero, LA. We were met by our tour captain Reggie, who got all 42 of us loaded onto a private pontoon boat. We made our way through the Barataria Swamps, the Crown Jewel of the Louisiana Purchase, and saw all sorts of interesting things. The tour was co-guided by Dr. Lyn Gettys (University of Florida) and by a Cajun "mystery man" who is well-known in the aquatics world but has asked to remain anonymous, who provided fun facts and trivia along the way. Reggie told us about growing up Cajun and spending time in Barataria over the years.

We saw lots of wildlife, including turtles, fish and gators (of course!). They were entertaining, but our primary mission was to check out the invasive aquatic plants in the swamps. So why go all the way to Louisiana to see the same weeds we have in Florida?!?!? Because, dear readers, the goal of this expedition was education! Most of our invasive plants have been intentionally introduced as ornamentals, aquarium plants, or for other purposes such as forage. As aquatic resource managers, you know that, but our tour attendees were horticulturists – the very group that historically has been responsible for importing many of our weeds. There has long been a battle between the "hort people" and the "weed people"; the horticulture folks promote new, unusual, exotic plants, while the weed folks protest that these imported species are invasive and will take over the ecosystem. In fact,

Figure 4. Tour guide Lyn Gettys and Captain Reggie. Photo courtesy Lyn Gettys, UF/IFAS.

Figure 5. Giant salvinia (left) and waterhyacinth (right). Photos courtesy Lyn Gettys, UF/IFAS.

Figure 6. Native marsh mallow. Photo courtesy Lyn Gettys, UF/IFAS.

this conflict is responsible for the creation of the University of Florida's Assessment of Non-Native Plants in Florida's Natural Areas (known affectionately as "the IFAS Assessment" – see the Spring 2015 issue of *Aquatics* for more information). Our objective during this tour was to let the horticulturists see first-hand how seemingly desirable introduced plants can escape into the wild and completely change the habitat. Some of the invasive plants we saw in the Barataria Swamp included giant and common salvinia (*Salvinia molesta* and *S. minima*; introduced as aquarium and water garden plants), hydrilla (*Hydrilla verticillata*; introduced as an oxygenator for aquariums), waterhyacinth (*Eichhornia crassipes*; introduced as a water garden ornamental), wild taro (*Colocasia esculenta*; introduced as a food crop and as an ornamental) and Chinese tallowtree (*Triadica sebifera*; introduced for tallow, soap and candle-making). In addition to the bad actors, we were able to show attendees native plants as well, including southern naiad (*Najas guadalupensis*), eelgrass (*Vallisneria americana*), marsh mallow (*Hibiscus grandiflorus*) and coontail (*Ceratophyllum demersum*). By the time we made it back to the dock, it was clear that our mission was accomplished – our tour-goers now had a better appreciation of how plants that seem fine as ornamentals can do very, very bad things to the ecosystem if they escape cultivation. As we boarded the wonderfully air-conditioned buses and headed back to New Orleans, all attendees were given a copy of the 3rd edition of "*Biology and Control of Aquatic Plants: A Best Management Practices Handbook*", known commonly as "the AERF BMP". We are grateful to the AERF for sponsoring this tour – thanks to their support, a new crop of horticulturists has seen the light and will be able to spread the word about not spreading introduced plants.

AERF
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Dr. Lyn Gettys (lgettys@ufl.edu) is an Assistant Professor of Agronomy at the University of Florida's Fort Lauderdale Research and Education Center.

USGS
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Nonindigenous Aquatic Species (NAS) Database Update

by Ian Pfingsten and Dan Thayer

The USGS Nonindigenous Aquatic Species (NAS) database for plants is currently being updated and is back on-line at nas.er.usgs.gov. We provide interactive distribution maps, fact sheets, a reference database, and alert system. Aquatic plant botanists Dan Thayer and Ian Pfingsten have recently joined the NAS Program to bring the plant side of the NAS database back. In addition to updating the distribution data and fact sheets for these species, they are contacting each of the states and provincial governments to create a contact list to ensure we have the most up-to-date information. We are ready to accept any non-native aquatic plant occurrences you are willing to share with us. Single reports can be sent via our reporting system at usgs.gov/stopANS, and larger datasets can be e-mailed to us at ipfingsten@usgs.gov.

Dan and Ian are working their way through the list of priority species based on feedback from federal, state, and local agencies (results are available at surveymonkey.com/results/SM-JK3HNY9D/). Four species are now available on the web site: hydrilla (separated by biotypes, as requested), Eurasian watermilfoil, starry stonewort, and water chestnut. These species have been reviewed, but please let us know if we are missing data or if you find any errors. Waterhyacinth (*Eichhornia crassipes*) and Brazilian waterweed (*Egeria densa*) are the next two species on our list. As distribution data are collected and validated for the other 184 nonindigenous aquatic plant species in the database, they will also be made available.

Ian Pfingsten (352-264-3517; email ipfingsten@usgs.gov) and Dan Thayer (352-264-3522; email dthayer@usgs.gov) are Botanists with the United States Geological Survey in Gainesville, FL.

The Aquatic Plant Management Society Recognizes Achievements at 2015 Annual Meeting

by Jeffrey D. Schardt, APMS Secretary

Delegates and guests of the Aquatic Plant Management Society (APMS) met for the 55th Annual Meeting, in conjunction with the South Carolina Chapter of APMS (SCAPMS), in Myrtle Beach, South Carolina from July 12-15, 2015. About 220 members from 28 states and the District of Columbia shared new research findings and operational experiences via 26 exhibitors, 50 oral presentations and 11 poster presentations at the 2015 meeting.

The APMS was formed in 1961 to provide a forum to exchange ideas and develop strategies to control nuisance aquatic plants. In keeping with the Society's original intent, the Annual Meeting not only offers formal presentations, but also provides opportunities to interact throughout the week during continental breakfasts, extended breaks, focus group luncheons, evening receptions and an Awards Banquet to honor members' outstanding achievements.

A critical core function of the APMS is promoting educational and student-related activities. Both APMS and SCAPMS sponsored fund-raising activities during the week, including a golf tournament prior to the meeting, silent auction, prize raffle, and a Duck Race and reception before the Awards Banquet. These events generated more than $8,000 for the two Society's student initiatives.

Student Awards

The Awards Banquet was held on Tuesday evening to recognize Member accomplishments. SCAPMS led off the Awards ceremonies by presenting Shannon Auell of Clemson University with the $3,000 Phillip M. Fields Scholarship Award. Dr. Brett Hartis of the Tennessee Valley Authority received the SCAPMS Member of the Year Award.

The APMS Student Presentation awards followed. Students are encouraged to report at the Annual Meeting on current research via oral or poster presentations. Judges evaluate students on their Abstract submission, project design, data organization and interpretation, on-time delivery, and professionalism in responding to questions. Cash prizes are offered for first ($300) through third ($100) place finishers.

Figure 2. Student Affairs Committee Chair Rebecca Haynie (back) introduces student presentation competitors.

Figure 1. Ken Manuel presents Shannon Auell with the SCAPMS Phillip M. Fields Scholarship Award.

13 students representing **6** universities entered **2015** competitions.

Thirteen students representing six universities entered this year's competitions. Evan Calloway of North Carolina State University placed second in the Poster Competition while Tyler D. Geer of Clemson University placed first for his poster

Figure 3. APMS President Cody Gray congratulates Student Poster Presentation Award winner, Tyler Geer (left) and Student Oral Presentation winner Erika Haug (right). Each received a $300 award.

entitled *Sediment Copper Concentrations, in situ Benthic Abundance, and Sediment Toxicity: Comparison of Coves Treated with Copper-Based Algaecides and Untreated Coves in a Southern Reservoir.*

Amanda West of Colorado State University and Alyssa Calomeni of Clemson University tied for third place in the oral presentations, with Kallie Kessler of Colorado State coming in second. Erika J. Haug of North Carolina State University placed first with her oral presentation entitled *Modes of Reproduction in Crested Floating Heart (Nymphoides cristata)*.

APMS also funds lodging and a textbook of the student's choice for student competition presenters, a luncheon during the conference for all students to interact and share ideas, and a post-conference field trip to a local area of aquatic plant management interest. Students elect a representative to serve a one-year term as Student Director on the APMS Board of Directors. Kallie Kessler of Colorado State University was elected by her peers as the 2015-2016 APMS Student Director.

The Aquatic Plant Management Society's marquis education initiative is a two-year, $40,000 Graduate Student Research Grant. Half of the funding for the Grant is from the collective contributions of the seven Regional Chapters. With sufficient funding available in the APMS Treasury, the Board elected to solicit proposals for an additional Grant for 2016-2018 funded entirely by APMS. Judges, consisting of a PhD representative from each of the Regional Chapters, selected Dr. Robert Richardson of North Carolina State University as recipient of the APMS Graduate Student Research Grant for 2016-2018

Figure 4. Vice President John Madsen (right) announces Dr. Rob Richardson of NCSU (left) as the recipient of the 2016-2018 APMS Graduate Student Research Grant.

Figure 5. Dr. David Spencer, recipient of the 2015 APMS Honorary Membership Award.

Figure 6. Greg MacDonald (left) and Linda Nelson (right) receive congratulations and the APMS President's Award from President Cody Gray for their long-time service to aquatic plant management.

for his proposal entitled: *Aspects of Monoecious Hydrilla Physiology and Response to Herbicide Combination Treatments.*

APMS Standing Awards

APMS presents several awards each year to members and others who have contributed to the Society or to the general field of aquatic plant management.

Honorary Membership

Honorary Membership is bestowed upon a person with at least ten years of membership in the Aquatic Plant Management Society, and who has retired after a distinguished career in aquatic plant management. At least 10 members in good standing with the Society must petition for the Honorary Membership and there must be a majority vote of approval from the Board of Directors. Honorary Membership was awarded in 2015 to Dr. David Spencer, who recently retired from USDA-ARS, for his many years as a Research Ecologist and for prolific publication in the field of aquatic plant ecology and management. David has been a Member of APMS since 1984, served on the Board, and was President of APMS in 1998-1999.

President's Award

Two President's Awards were presented in 2015, each for extended years in aquatic plant management research and publication. Dr. Greg MacDonald is a Professor

Figure 7. Steve Hoyle (center) receives the 2015 Max McCowen Friendship Award from Rob Richardson (left) and Cody Gray (right).

of Weed Science and Agronomy at the University of Florida, has been an APMS Member since 1990, and served as APMS President in 2009-2010. He has authored or co-authored over 450 refereed journal articles, abstracts, and non-refereed papers and articles. Greg MacDonald served on the board of directors for the Southern Weed Science Society, the Florida Weed Science Society and Florida Exotic Pest Plant Council. He also executed two terms as the APMS representative to the Weed Science Society from 2001-2007 and on the board of directors from 2004-2007.

Dr. Linda Nelson is the Assistant Technical Director for Civil Works Environmental Engineering and Sciences at the U.S. Army Engineer Research and Development Center (ERDC) Environmental Laboratory. She joined APMS in 1991, chaired the Student Affairs Committee, served as APMS Secretary and Newsletter Editor (2001-2007), and as President in 2010-2011. She has authored and co-authored 20 scientific papers in peer-reviewed journals and more than 25 ERDC reports on aquatic and wetland invasive plant management.

Max McCowen Friendship Award

The Max McCowen Friendship Award is presented to a member of the Society whose demeanor and actions display sincerity and friendship as an ambassador of the APMS. The recipient of this award in 2015, Steve Hoyle of North Carolina State University, has been a positive representative of the Society since joining in 1997 and is also a long-time member and President of the SCAPMS. In addition to 30+ years of technical contributions, Steve has conducted innumerable outreach and extension activities, including graduate student training, guest lecturing, and service to APMS and SCAPMS as well as other regional societies and groups, all with a positive approach and friendly disposition.

Outstanding Graduate Student Award

Erika Haug of North Carolina State University was recognized as the APMS Outstanding Graduate Student for 2015. Erika joined APMS as a student in 2014 and was elected by fellow students as the 2014-2015 APMS Student Director. She also won the APMS Student Oral Presentation competition in 2015.

Outstanding Journal of Aquatic Plant Management (JAPM) Article Award

This award is judged by the APMS Editor and Associate Editors, particularly for project design, content, and relevance from the articles published in the JAPM during the previous year. Dr. Mike Netherland and LeeAnn Glomski won the Outstanding JAPM Article Award for their 2014 contribution: Mesocosm evaluation of triclopyr

Figure 8. Erika Haug receives the Outstanding Graduate Student Award from major professor Rob Richardson and President Cody Gray.

Figure 9. Mike Netherland accepts the Outstanding JAPM Article Award.

Figure 10. John Rodgers receives the Outstanding Research and Technical Contribution Award from Cody Gray.

on Eurasian watermilfoil and three native submersed species: The role of treatment timing and herbicide exposure.

Outstanding Research and Technical Contribution

Dr. John Rodgers of Clemson University received the Outstanding Research and Technical Contribution Award for 2015, honoring nearly 40 years of research and numerous publications with three different universities. Dr. Rodgers is a pioneer in the management of harmful algal blooms and has mentored more than 90 graduate students. Dr. Rodgers has been a Member of APMS since 1999, has overseen two five-year APMS strategic planning sessions, and was elected as APMS Vice President for 2015-2016.

T. Wayne Miller Distinguished Service Award

The T. Wayne Miller Distinguished Service Award was presented to Jeffrey Schardt for his 39-year career organizing and promoting aquatic plant management in Florida public waters. Jeff joined APMS in 1996 and has served on the Board since 2003 as Director, President (2005-2006) and as Secretary since 2009. He represented aquatic plant management interests during two three-year terms on the Invasive Species Advisory Committee and was active is shaping state and federal implementation of NPDES aquatic pesticide use regulations. Jeff Schardt was also influential in developing and distributing educational and outreach materials related to aquatic plants and their management for the state of Florida and for APMS.

Outgoing Board of Directors Members

The APMS recognized three members from the Board of Directors reaching the ends of their terms. Drs. Michael Masser of Texas A & M and Joe Vassios from UPI each served three years as Directors, and Erika Haug of the North Carolina State University (NCSU) finished her one-year term as the APMS Student Director. Finally, incoming President Dr. Rob Richardson, also of NCSU, accepted the gavel from outgoing President Dr. Cody Gray of UPI. Cody will serve one more year on the APMS Board as the Immediate Past President.

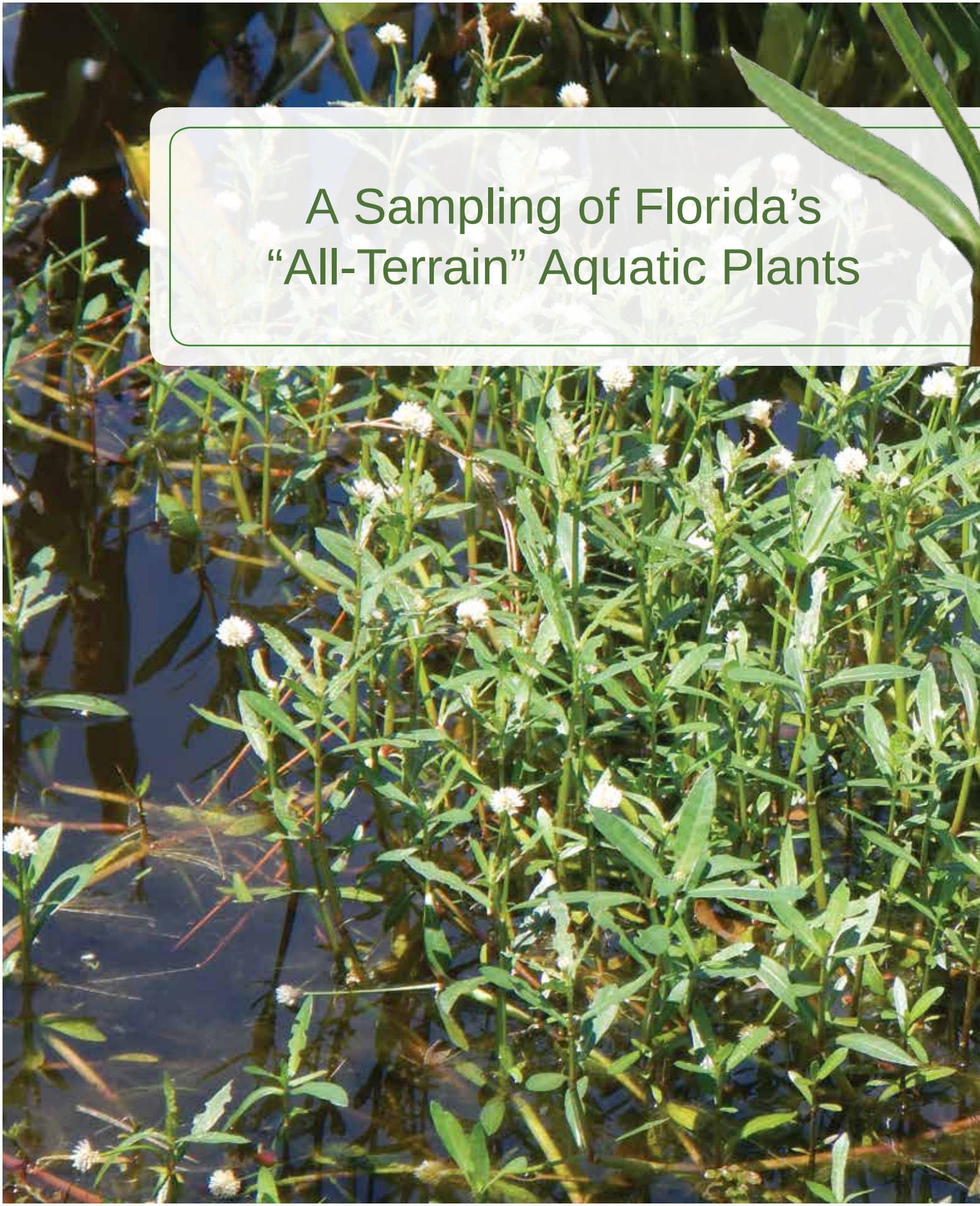
Please visit the Aquatic Plant Management Society website at www.apms.org to learn more and to become a member of APMS.

Jeff Schardt (jeff.schardt@gmail.com) recently retired from the Florida Fish and Wildlife Conservation Commission and is now the APMS Secretary.

Figure 11. Jeff Schardt receives the T. Wayne Miller Distinguished Service Award from Vice President John Madsen and President Cody Gray.

www.apms.org

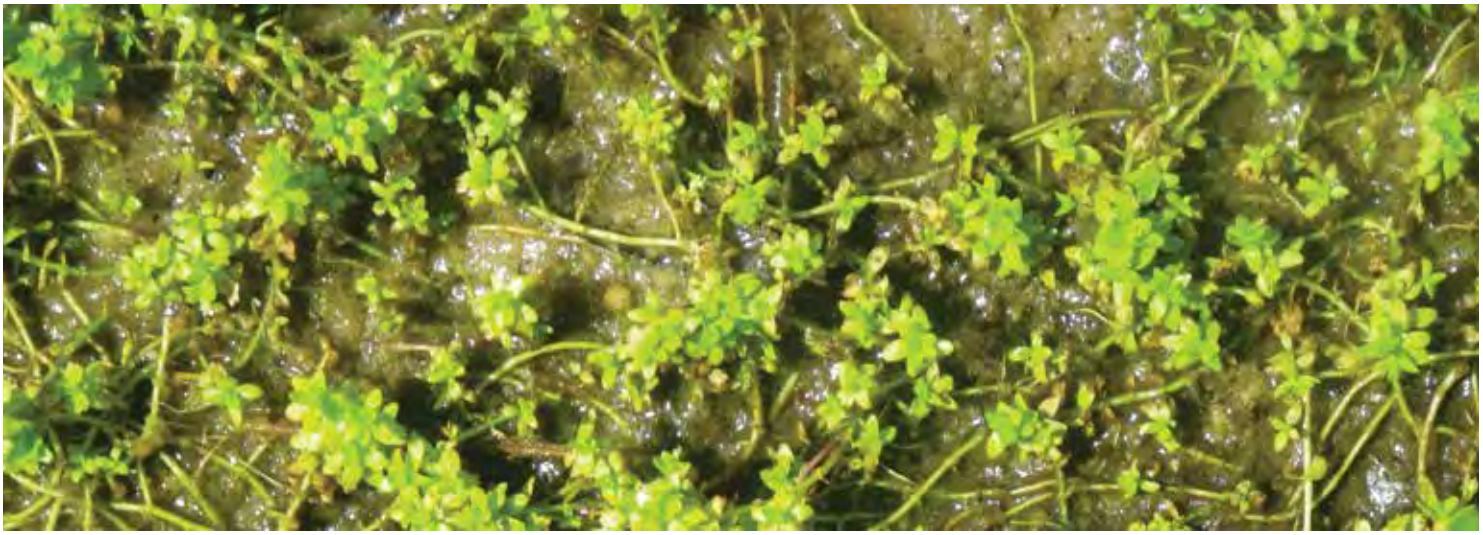
A Sampling of Florida's "All-Terrain" Aquatic Plants



ALLIGATORWEED

By Lyn A Gettys

Alligatorweed (*Alternanthera philoxeroides*) is an introduced invasive aquatic species. It is listed as a prohibited aquatic plant by the Florida Department of Agriculture and Consumer Services (FDACS), meaning that it is illegal to collect, possess, transport, cultivate, or import the species. It is thought that alligatorweed was introduced to Florida via ballast water in the late 1800s. There is some debate surrounding this explanation because almost all ballast water was discharged from seafaring ships, which used seawater for ballast, but alligatorweed is not salt-tolerant. Alligatorweed grows under both submersed and emergent conditions and is often found growing along the shorelines of lakes, canals, reservoirs and other bodies of water. The leaves of alligatorweed range from lanceolate (sword-shaped) to nearly linear (with parallel sides) and attached to the stem in an opposite arrangement (borne in pairs across from each other). The inflorescence is a papery white cluster and is very characteristic of the species. A number of herbicides can be used to manage alligatorweed, including glyphosate and imazapyr. The alligatorweed flea beetle (*Agasicles hygrophila*), a native of Brazil and Argentina, was introduced to the country by the United States Department of Agriculture (USDA) in the 1960s as a biological control agent for alligatorweed because it feeds exclusively on this noxious weed. The alligatorweed flea beetle has successfully become established throughout Florida and causes substantial damage to many populations of alligatorweed; in fact, feeding damage by the beetles on alligatorweed has eliminated the need for herbicide applications in many areas.



BABYTEARS

There are two species of **babytears** (*Micranthemum* sp.) in Florida and both are native to the state. *M. umbrosum* is found throughout the southeastern US and is present as far north as Virginia and west to Texas, while *M. glomeratum* is found only in Florida. Like alligatorweed, babytears grows under both submersed and emergent conditions and is often found growing along the shorelines of lakes, canals, reservoirs and other bodies of water. Emergent plants creep along the ground and usually remain low-growing, but dense populations may be up to 5" in height. Submersed populations can grow in water that is several feet deep and can easily be mistaken for a number of other species, including waterhyssop (*Bacopa monnieri*), elodea (*Elodea canadensis*), hydrilla (*Hydrilla verticillata*) and rotala (*Rotala rotundifolia*). The leaves of babytears are bright green, small and smooth-textured; emergent leaves tend to be round or nearly so, while submersed leaves tend to be longer and thinner. Leaves are attached to the thin, green stem in groups of three or four at each node. Flowering is rare in both species.

PARROTFEATHER

Parrotfeather (*Myriophyllum aquaticum*) is an introduced invasive aquatic species. This South American native was introduced to the United States as an aquarium plant in the late 1800s; it escaped cultivation and has become an aquatic weed in many parts of the country. Although it is not listed as a prohibited aquatic plant by FDACS, parrotfeather it is a close relative of Eurasian watermilfoil (*M. spicatum*), which is listed as prohibited by FDACS. Parrotfeather is banned, prohibited or classified as a noxious weed in a number of states, including Alabama, Connecticut, Maine, Vermont and Washington. The IFAS Assessment of Non-Native Plants in Natural Areas (http://assessment.ifas.ufl.edu/) has rated parrotfeather as a "caution" species in all part of Florida, meaning it may be recommended for planting but should be managed to prevent escape (although the assessment of this species is listed as incomplete). As with alligatorweed and babytears, parrotfeather grows under both submersed and emergent conditions and is common along the shorelines of lakes, canals, reservoirs and other bodies of water. The leaves of parrotfeather are highly dissected and are attached to the stem in a verticillate arrangement, with many leaves attached in a whorl around the stem at each node. Submersed growth is fine with threadlike leaves, which is characteristic of species in the *Myriophyllum* genus. Emergent growth occurs in "wet feet" areas along banks and forms surface mats from topped-out growth of submersed populations. Leaves of the emergent form of parrotfeather are light green and waxy due to a think cuticle on the surface of the leaves, and stem tips are usually tipped up above the surface of the water. The waxy coating keeps water out of emergent leaves; the next time you encounter a population of emergent parrotfeather in the field, pull the tip of the plant below the water, hold it for a few seconds, then release it. If you watch closely, you'll notice that when the tip is pulled under water, an air bubble will form around it. When you release the tip, it will spring back above the surface of the water and it will be completely dry. While this phenomenon can be a great source of entertainment when you need a break in the field, it also makes chemical control of parrotfeather more difficult because herbicides cannot penetrate the waxy cuticle. A number of herbicides can be used to manage alligatorweed, including diquat, triclopyr and 2,4-D, but the use of a surfactant is critical to aid herbicide penetration through the waxy coating on parrotfeather leaves.

Dr. Lyn Gettys (lgettys@ufl.edu) is an Assistant Professor of Agronomy at the University of Florida IFAS Fort Lauderdale Research and Education Center.

Aquavine

AERF – What Is It Wednesday!?!?

Are you a social media junkie? Need to add to your wardrobe? Good with aquatic plant ID? Well, we have the game for you! Next time you are perusing your timeline on a Wednesday, stop by the Aquatic Ecosystem Restoration Foundation's Facebook page and test your identification skills. Each and every Wednesday, AERF posts a photo of something aquatic-related. The first person to guess correctly will receive a FREE AERF t-shirt. Answers will be announced each Thursday, so the next time you are bored on a Wednesday, stop by and play!

Florida APMS Student Scholarships

The Florida Aquatic Plant Management Society offers two types of scholarships. **The William L. Maier Jr. Memorial Scholarship** (application deadline August 1) is available to U.S. citizens who are enrolled in an accredited graduate program at a Florida university or college and are majoring in a field of study directly related to the management of freshwater aquatic vegetation for the ecological benefit of aquatic or freshwater environments. **The Paul C. Myers Applicator Dependent Scholarship** (application deadline June 1) is open to deserving dependents of FAPMS members who are (or will be) enrolled in college. Both scholarships are competitive. For more information and application materials, go to fapms.org and click on the "Scholarships" tab at the top of the page.

Northeast APMS Student Scholarship

The Northeast Aquatic Plant Management Society provides scholarship funds designed to encourage and involve exceptional graduate students in the field of aquatic plant management. Awards may be used as a stipend, for research budget expenses (travel, supplies, etc.), to defer fees, to defray living expenses for summer research, or any combination of these items. Applicants should be enrolled in a Master's or Doctoral level research program with a college or university in the northeast region of the United States, with a research focus in the area of aquatic plant management. There are no deadlines for application. Applications that are received by the Scholarship Committee will be held until the next scheduled Board of Directors meeting for review. NEAPMS will review applications twice annually, once in September and once in January, and make awards based on candidate qualifications and funding availability. For more information, visit www.neapms.org/graduate-student-scholarship-award/

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Aquavine

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APMS Graduate Student Scholarship

A graduate student research grant in the area of aquatic plant management and ecology is being offered by the Aquatic Plant Management Society's research and education initiative. Co-sponsors of this academic award include regional APMS chapters: Florida, MidSouth, Midwest, Northeast, South Carolina, Texas, and Western. This competitive grant will be awarded to a full-time graduate student to conduct research in an area involving aquatic plant management techniques (used alone or integrated with other management approaches) or in aquatic ecology related to the biology or management of regionally or nationally recognized nuisance aquatic vegetation. This solicitation for proposals is open to any full-time faculty member and/or graduate student of an accredited U.S. academic institution. A faculty sponsor must be identified if the application is submitted by a graduate student. Proposals are due by April 15; more information is available at apms.org/wp/wp-content/uploads/2012/09/Graduate-Student-Research-Grant-Announcement-and-RFP-2016-FINAL.pdf

Call for Papers – Florida Lake Management Society

The Florida Lake Management Society is accepting abstracts for their 2016 Technical Symposium, which will take place June 7-10 at The Shores Resort and Spa in Daytona Beach Shores, FL. Abstract titles are due February 15 and full abstracts are due April 15; both should be emailed to FLMShome@aol.com. For more information, visit the FLMS webpage at www.flms.net.

Call for Papers – Aquatic Plant Management Society

The Aquatic Plant Management Society is accepting abstracts for their 2016 Annual Meeting, which will take place July 17-20 in Grand Rapids, MI. Abstracts are due April 29 and should be submitted online through the WSSA Title and Abstract Submission website at wssaabstracts.com/. More information about abstract submission can be found in the Call for Papers at apms.org/wp/wp-content/uploads/2014/09/APMS-2016-First-Call-for-Papers.pdf. More information about the meeting is located on the 2016 meeting website at apms.org/annual-meeting/2016-annual-meeting/

Calendar of Events 2016

January 12-14
Northeast Aquatic Plant Management Society (www.neapms.org); Saratoga Springs, NY

January 25-29
Florida Mosquito Control Association Dodd Short Course (www.dodd.floridamosquito.org/Dodd/); Altamonte Springs, FL

February 8-11
Weed Science Society of America (www.wssa.net); San Juan, Puerto Rico

February 29-March 1
Florida Weed Science Society (www.sites.google.com/site/floridaweedsciencesociety); Haines City, FL

March 6-9
Midwest Aquatic Plant Management Society (www.mapms.org); Grand Rapids, MI

March 21-23
Western Aquatic Plant Management Society (www.wapms.org); San Diego – Del Mar, CA

April 10-14
19th International Conference on Aquatic Invasive Species (www.icais.org); Winnipeg, Manitoba, Canada

April 13-15
Florida Vegetation Management Association Annual Conference and Trade Show (myfvma.org); Daytona Beach, FL

May 2-5
UF/IFAS Aquatic Weed Control Short Course (www.conference.ifas.ufl.edu/aw); Coral Springs, FL

June 7-10
Florida Lake Management Society (www.flms.net); Daytona Beach Shores, FL

June 19-25
7th International Weed Science Congress (www.iwss.info); Prague, Czech Republic

July 17-20
Aquatic Plant Management Society (www.apms.org); Grand Rapids, MI

Paul C. Myers Applicator Dependent Scholarship

The Florida Aquatic Plant Management Society Scholarship and Research Foundation, Inc. is pleased to announce the availability of the *Paul C. Myers Applicator Dependent Scholarship*, which provides up to $1,500 to deserving dependents of FAPMS members. The scholarship is based on:

1. The applicant's parent or guardian having been a FAPMS member in good standing for at least three consecutive years

2. Financial need, which will be determined based on need and the expected family contribution amount indicated on the processing results of a Student Aid Report (OMB No. 1845-0008). This report is available by completing a Free Application for Federal Student Aid Federal Form available online at fafsa.ed.gov

3. The applicant being a high school senior entering college the next academic year, attending community college, or being a college undergraduate

4. An evaluation of the quality of the application and required essay by the Scholarship Selection Committee, which is composed of three FAPMS members and four FAPMS Scholarship and Research Foundation members

5. Submission of a completed application by June

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More information and the application packet are online at www.fapms.org/myers_scholar.html or contact Keshav Setaram at 407-891-3562