REGIONAL MEETING
OF THE SOUTHEAST EXOTIC PEST PLANT COUNCIL
SEPT. 14-16 - BLUFFTON, S.C.
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>10:00 AM</td>
<td>SE EPPC Board meeting</td>
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<tr>
<td>12:00 PM</td>
<td>Registration</td>
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<tr>
<td>1:00</td>
<td>Presidents Welcome</td>
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<tr>
<td>1:20</td>
<td><strong>Keynote 1 - Christopher Oswalt et al.</strong>: Invasive plant monitoring</td>
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<tr>
<td></td>
<td>and data sharing across the Southern States</td>
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<tr>
<td>2:10</td>
<td><strong>Stephen Enloe</strong>: Are you smarter than a fifth-grader? The cogongrass</td>
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<tr>
<td></td>
<td>quiz every land manager should take.</td>
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<tr>
<td>3:00</td>
<td>Networking break (refreshments provided)</td>
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<tr>
<td>3:30</td>
<td><strong>Candice Prince (Student)</strong>: Spore Reproduction of Japanese Climbing</td>
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<td></td>
<td>Fern in Florida as a Function of Management Timing</td>
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<td>3:50</td>
<td><strong>AfSari Banu (Student)</strong>: Herbicide efficacy on <em>Ludwigia hexapetala</em></td>
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<tr>
<td></td>
<td>and <em>Ludwigia grandiflora</em> types in Florida</td>
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<tr>
<td>4:10</td>
<td><strong>Cody Lastinger (Student)</strong>: Brazilian pepper tree (<em>Schinus terbe</em></td>
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<td>inthifolius*) control in Florida’s mangrove communities</td>
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<td>4:30</td>
<td>SE EPPC Regional Chapter updates</td>
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<tr>
<td>5:00</td>
<td>Session ends</td>
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<tr>
<td>5:30</td>
<td><strong>Social and Poster presentations</strong>: presenters will need to stand</td>
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<td></td>
<td>by their posters for 45 minutes</td>
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<tr>
<td>7:00</td>
<td>Adjourn for the day</td>
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**Thursday, Sept. 15**

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<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8:00 AM</td>
<td>Coffee</td>
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<tr>
<td>8:30</td>
<td><strong>Keynote 2 - Rebekah Danielle Wallace</strong>: UGA Center for Invasive</td>
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<td></td>
<td>Species and Ecosystem Health: Cut the jargon and turn people into</td>
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<tr>
<td></td>
<td>advocates!</td>
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<tr>
<td>9:00</td>
<td><strong>Stephanie Hickel &amp; Steve Compton</strong>: Fighting cogongrass in South</td>
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<td></td>
<td>Carolina</td>
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<tr>
<td>9:20</td>
<td><strong>Steve Compton</strong>: Bengal dayflower: a threat to longleaf forests</td>
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<tr>
<td>9:40</td>
<td><strong>Stephen Enloe</strong>: Selective torpedograss (<em>Panicum repens</em> L.)</td>
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<td></td>
<td>control in aquatic and riparian areas</td>
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<tr>
<td>10:00</td>
<td><strong>Colette Jacono</strong>: Distinction within the <em>Ludwigia uruguayensis</em></td>
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<td></td>
<td>complex in Florida</td>
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<tr>
<td>10:30</td>
<td>Networking break (refreshments provided)</td>
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<tr>
<td>10:50</td>
<td><strong>Nancy Loewenstein et al.</strong>: Phenotypic Diversity among Cogongrass</td>
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<td>Populations and Response to Glyphosate</td>
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<td>11:10</td>
<td><strong>Rima Lucardi et al.</strong>: Barbarians at the gates: The Federal Noxious</td>
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<td></td>
<td>Weed prevention survey at the Port of Savannah</td>
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<tr>
<td>11:30</td>
<td><strong>Carrie R. Adams et al.</strong>: Distribution and management of <em>Phragmites</em></td>
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<td>australis* in the southeastern US: Implications for Florida</td>
</tr>
<tr>
<td>11:50</td>
<td><strong>Scott Frock</strong>: The right Chemical for the right job</td>
</tr>
</tbody>
</table>
12:10 PM Adjourn session
12:30-4:30 Get box lunches and split for field trips

Three options for the afternoon:

1. **Field trip to Spring Island** and how they manage their community (transportation to be announced)
2. **Field trip and workshop to Green’s Shell Ring**, a historical site of a Native American village with a hack-and-squirt demonstration against glossy-leaved privet by **Stephen Enloe** *(transportation on your own)*
3. **Aquatic Plant ID workshop** at the meeting space: **Rob Emens**

5:30-9:00 Meet at Maritime Center for Evening Social: Low Country Boil: Entertainment by The Swamp Rose Family Band
Silent Auction concludes
Awards for Student Presentations

**Friday, Sept. 16**

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>8:00 AM</td>
<td>Coffee</td>
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<tr>
<td>8:40</td>
<td><strong>Janie Marlow</strong>: “Wild Plants on the Rabbit” and reaching the unchurched...</td>
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<tr>
<td>9:00</td>
<td><strong>Rob Emens</strong>: The development, implementation and outcome of a volunteer-based survey for Hydrilla in the Chowan River and Albemarle Sound, North Carolina</td>
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<tr>
<td>9:20</td>
<td><strong>Cindy Hekking</strong>: UMNA The Clemson Meadow Restoration Project</td>
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<td>9:40</td>
<td><strong>Katie Moore</strong>: Junior Invasive Inspector Program</td>
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<tr>
<td>10:00</td>
<td>Networking break (refreshments provided)</td>
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<tr>
<td>10:30</td>
<td><strong>Stephen Enloe</strong>: Herbicide label interpretation in riparian areas</td>
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<tr>
<td>11:30</td>
<td><strong>Bill Steele</strong>: Invasive plants in South Carolina: Identification, reporting and control</td>
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<tr>
<td>11:50</td>
<td><strong>Dehlia Albrecht</strong>: Invasive Plant Education – Invading a Classroom Near You!</td>
</tr>
<tr>
<td>12:10 PM</td>
<td>Conference concludes</td>
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**Sponsors**
The South Carolina Exotic Pest Plant Council and the Southeast Exotic Pest Plant Council would like to thank the businesses and organizations that made this meeting possible!
PRESENTATIONS
WEDNESDAY, SEPT. 14

INVASIVE PLANT MONITORING AND DATA SHARING ACROSS THE SOUTHERN STATES

Presenter
Christopher M. Oswalt (USDA Forest Service); coswalt@fs.fed.us

Co-authors
Theodore R. Ridley (USDA Forest Service); Songlin Fei (Purdue University); Sonja N. Oswalt (USDA Forest Service); Basil V. Ionnone III (Purdue University); Kevin M. Potter (North Carolina State University); Qinfeng Guo (USDA Forest Service); Brian Pijanowski (Purdue University)

Abstract
The Southern Research Station (SRS) Forest Inventory and Analysis (FIA) program began monitoring invasive plant (IP) species in 2001 in response to a growing desire to track potential forest health threats on United States (US) forestland. Invasive plants are threats to US forests through the displacement of native species, the alteration of soil physical and chemical properties, and the disruption of successional pathways among other potential impacts. Because of the environmental and ecological burdens posed by these species, IP inventory and monitoring is considered a priority in many parts of the US. The SRS-FIA IP program has produced significant results and contributed considerably to the understanding of the distribution and spread of IP in the southern U.S. No other program in the United States provides a mechanism for monitoring the spread of common invasive plant species across both public and private lands on a regularly updated basis. The survey of invasive plant species was added to the traditional timber resource surveys that have been underway since the 1930’s. Over the past 3 years, the SRS FIA inventory program has developed new data access tools as part of a push for National consistency in data collection all-the-while providing for significant research discoveries being afforded by compilations of regional data.

ARE YOU SMARTER THAN A FIFTH-GRADER? THE COGONGRASS QUIZ EVERY LAND MANAGER SHOULD TAKE

Presenter
Stephen Enloe, Extension Weed Specialist, Center for Aquatic and Invasive Plants, University of Florida; 7922 NW 71st St. Gainesville, FL 32653; 352.339.1319; sfenloe@ufl.edu

Abstract
Cogongrass (Imperata cylindrica) is a highly invasive warm-season grass from Southeast Asia. Introduced over 100 years ago to Grand Bay, Alabama, cogongrass has since spread across much of the southeastern United States. It is now problematic on roadsides, rights of ways, pine plantations and many natural areas. Land managers commonly struggle to achieve effective cogongrass control. This presentation will be an interactive quiz and use audience participation software to test your knowledge on cogongrass biology, ecology, and management.

Biography
Dr. Enloe earned his Ph.D at UC Davis in Plant Biology, a Master’s degree in weed science from Colorado State University, and an undergraduate degree in Agronomy from NC State. Dr. Enloe has been involved with invasive plant research and extension for the past 19 years. He has worked throughout the western and southeastern United States, including California, Colorado, Wyoming, Alabama, and now Florida. His current focus at the IFAS Center for Aquatic and Invasive Plants as an Extension Specialist includes both upland and aquatic species. Key areas of research have included IPT methods for controlling Chinese privet, Chinese tallowtree, Chinaberry, and a host of other woody invasive plants.
SPORE REPRODUCTION OF JAPANESE CLIMBING FERN IN FLORIDA AS A FUNCTION OF MANAGEMENT TIMING

Presenter
Candice M. Prince, Ph.D. Student. Environmental Horticulture Department, University of Florida, P.O. Box 110675, Gainesville, FL 32611; 321.446.1035, cprince14@ufl.edu

Co-authors
Dr. Gregory E. MacDonald, Professor. Agronomy Department, University of Florida, P.O. Box 110500, Gainesville, FL 32611; 352.294.1594, pineacre@ufl.edu; Dr. Kimberly Bohn, Extension Educator, Forestry and Natural Resources. PennState Extension, Pennsylvania State University, 17129 Rt. 6, Smethport, PA 16749; 814.887.5613, kkb29@psu.edu; Ashlynn Smith, Undergraduate Research Assistant. University of Florida, West Florida Research and Education Center, 5988 Highway 90, Bldg. 4900, Milton, FL 32583; 850.612.2480, ashlynnsmith@ufl.edu; Dr. Mack Thetford, Associate Professor. University of Florida, West Florida Research and Education Center, 5988 Highway 90, Bldg. 4900, Milton, FL 32583; 850.983.7130, thetford@ufl.edu

Abstract
Japanese climbing fern (Lygodium japonicum) is an aggressive perennial vine native to eastern Asia. This species was introduced for ornamental use in the early 1900s, and has since escaped cultivation to become problematic in mesic habitats throughout the southeastern United States. Japanese climbing fern is a prolific spore producer, with the greatest spore production event occurring in the fall through early winter. Here, we evaluated the success of three broadcast herbicide applications in restricting spore development in Japanese climbing fern. Herbicide treatments included: 1) glyphosate at 3 lbs-ai/ac, 2) metsulfuron methyl at 2oz/ac, and 3) a combination of glyphosate and metsulfuron methyl at those same rates. Herbicides were applied at three time intervals from July to September, when plants were at different developmental stages of spore reproduction. Herbicide trials were conducted at two sites in the panhandle and two sites in central Florida. Approximately four weeks after herbicide application, spores were harvested for germination trials. While broadcast applications did result in reduced gametophyte growth from harvested spores, there was no difference in gametophyte development between herbicide treatments. In the panhandle, herbicides resulted in a reduction in gametophyte development in August and September, while in central Florida, gametophyte development was reduced in July and September but not August. These inconsistencies were likely caused by weather conditions (the panhandle experienced an unusually dry July, while in central Florida there was a rain event shortly after herbicide application). Due to these inconsistencies, the experiment is currently being repeated at three sites across the panhandle and central Florida.

Biography
Candice is a graduate student at the University of Florida. She received her undergraduate degree from the University of Florida in 2014, where she majored in Plant Science with a specialization in Restoration Horticulture. She is currently working towards the completion of her Ph.D. in Horticultural Sciences, for which she is studying invasive grass biology and management with her advisor Dr. Greg MacDonald.

HERBICIDES EFFICACY ON LUDWIGIA HEXAPETALA AND LUDWIGIA GRANDIFLORA TYPES IN FLORIDA

Presenter
Afsari Banu, Graduate Assistant, University of Florida, Agronomy Department/Center for Aquatic and Invasive Plants, 7922 NW 71st St., Gainesville, FL 32653 352-777-5011, afsari@ufl.edu

Co-authors
Stephen F. Enloe, Associate Professor, University of Florida Agronomy Department/Center for Aquatic and Invasive
Abstract

*Ludwigia hexapetala* and three taxonomic types of *L. grandiflora* identified in our larger study demonstrate phenotypic differences in growth habit and population structure. Whether taxonomic or phenotypic differences demonstrate differential sensitivity to herbicide management has not been determined. The objective of this study is to evaluate taxonomic types in Florida for their response to aquatic herbicides. Four herbicides were tested on five representative accessions of one month old plants in the greenhouse. Each herbicide was applied at seven different doses and on each accession in replicates of four. Shoot biomass was harvested 30 days after treatment (DAT) and total biomass after 60 to 75 DAT. Nonlinear regression analysis was performed on biomass dry weight by using the drc package in R by using three parameter log-logistic model and ANOVA was conducted to determine whether the regression model was an appropriate fit to data. Preliminary data indicated significant differences in population response to herbicide treatment. Final data will be presented.

Biography

Afsari Banu is a graduate student specializing in weed science in the Department of Agronomy at the University of Florida. In year 2014, Afsari acquired a Master of Science in Agronomy from the University of Agricultural Sciences, Bangalore, India with a focus on chemical weed management in cereal crops. Her current research interests are managing invasive weeds through integrated weed management approach, herbicide screening and investigation of herbicide resistance in invasive plants.

BRAZILIAN PEPPER TREE (SCHINUS TEREBINTHIFOLIUS) CONTROL IN FLORIDA’S MANGROVE COMMUNITIES

Presenter

Cody A. Lastinger, Graduate Assistant, University of Florida, Agronomy Department/Center for Aquatic and Invasive Plants 7922 NW 71st St, Gainesville, FL, 32653; 863.581.5033, clastinger@ufl.edu

Co-author

Stephen F Enloe, Associate Professor, University of Florida

Abstract

Brazilian pepper tree (*Schinus terebinthifolius*) is an invasive species that was brought to Florida from Brazil and Argentina in the late 1800s as an ornamental tree. It has since become an extremely troublesome plant to control and has invaded many ecosystems in Florida, including mangrove communities. Mangroves are vital to Florida’s coastal regions, and they provide both critical habitat for wildlife and soil stabilization along the coast. A major issue that plagues Brazilian pepper tree control in mangrove stands is that no selective treatments have been identified. This has made selective aerial treatment of peppertree infested mangrove islands virtually impossible. Our objective was to test the effects of aquatic herbicides for selective control of Brazilian pepper tree that is invading these mangrove communities. We also tested aquatic labeled herbicides on the four native mangrove species, which are protected, to screen for sensitivity. Past observations from land managers around the state indicated that mangrove species were sensitive to the herbicides commonly used for Brazilian pepper tree control, and it is important to find a truly selective herbicide to protect the delicate mangrove communities in Florida. We also tested three classes of Brazilian pepper tree to test if life stage had any effect on the efficacy of the herbicides. We tested seedlings in the 1 to 2 true leaf stage, juvenile plants that were 40 cm tall, and well established plants that were approximately 75 cm tall at the time of application. Injury and biomass were assessed 90 days after treatment on all size classes and on the four mangrove species. These results indicate limited potential from most of the newer aquatically registered herbicides for Brazilian peppertree control.

Biography

Cody Lastinger was born in Lakeland, Fla., in September of 1990. He graduated from Lakeland Christian School in 2009, and then attended Florida Southern College where he received a bachelor of science degree in citrus production in 2013. Fallowing graduation, Cody proceeded to pursue a master’s degree from the University of Florida, Department of Agronomy with a focus in weed science, which he received in the summer of 2015. Cody started his Ph.D. program at the University of Florida, Center for Aquatic and Invasive Plants in the fall of 2015 working on control of Brazilian pepper tree in Florida’s mangrove communities.
CUT THE JARGON AND TURN PEOPLE INTO ADVOCATES

Presenter
Rebekkah Danielle Wallace, EDDMapS Data Coordinator at the Center for Invasive Species and Ecosystem Health, University of Georgia, bekahwal@uga.edu

Abstract
While we find it fairly easy to talk to people within our field, narrowly in invasive species and within the broader scopes of research, outreach, and management, when talking to the public and especially media, it can be a bit difficult to impress upon them the importance of invasive species. How do we distill down the important points on invasive species? How do we talk to people directly about our individual careers and how the things we do impact them? Finally, how do we turn these encounters with the public into productive conversations and encourage them to become advocates? Most of these conversations are short and casual but there is also the opportunity to turn part-time or seasonal employees and volunteers into long-term advocates with the right conversations. There will be some differences in talking to someone once briefly and being able to talk to someone repeatedly over a longer period of time in working with them, but at the most basic it is best to learn about your audience and find ways to relate invasive species to their interests. Recruiting informed advocates on behalf of those fighting the introduction and spread of invasive species can help to inform the rest of the public, the media, and policy makers of the threat of invasive species.

Biography
Rebekah is the EDDMapS Data Coordinator at the Center for Invasive Species and Ecosystem Health at the University of Georgia. She graduated from Abraham Baldwin Agricultural College in 2005 with an A.S. in Agriculture, the University of Georgia in 2007 with a B.S. in Agriscience and Environmental Systems and in 2009 with a M.S. in Crop and Soil Sciences with an emphasis in Weed Science. Duties at Bugwood include: Identify and integrate state, regional and national invasive species data into EDDMapS, identify gaps in existing distribution data, develop protocols and standards for data included in EDDMapS and work with collaborators to share data between systems, present information and project updates to funding agencies and professional organizations, and participate in project reports, cooperative agreements and grant writing.

FIGHTING COGONGRASS IN SOUTH CAROLINA

Presenter
Steve Compton, Environmental Health Manager, Clemson University, Department of Plant Industry, 511 Westinghouse Rd., Pendleton, SC, scompto@clemson.edu

Abstract
South Carolina is facing an invasive plant species that could be far worse than other rampant exotics like kudzu. The exotic invasive cogongrass is considered to be one of the top ten worst weeds in the world. The pest was first found in South Carolina in 1987 at a site in Hampton County that is still active. Clemson University’s Department of Plant Industry is charged with the eradication of this plant and has treated all reported infestations, but new sites are found each year. Steve Compton will present updated information on identification and eradication efforts in South Carolina.

Biography
Steve Compton is a native of upstate South Carolina and obtained a degree in biology from Presbyterian College. Steve has worked in agriculture, horticulture, and the greenhouse industry for more than 35 years. In 2004, Steve joined
Clemson University's Department of Plant Industry and is currently working to slow the spread of regulated invasive species in South Carolina and surrounding states. Steve spends much of his time educating industry and the private sector in identification and potential pathways of harmful organisms which adversely affect agriculture and trade.

**BENGAL DAYFLOWER: A THREAT TO LONGLEAF FORESTS**

**Presenter**

Steve Compton, Environmental Health Manager, Clemson University, Department of Plant Industry, 511 Westinghouse Rd., Pendleton, SC, scompto@clemson.edu

**Abstract**

Benghal dayflower (BDF) (tropical spiderwort, *Commelina benghalensis*) is designated as both a state and federal noxious weed. BDF is a significant problem in row crops, because it is tolerant to many herbicides. Recent detections in South Carolina were made in peanut fields, soybean fields and natural areas with at least 500 acres confirmed to be infested. This most invasive weed is now reported to be causing problems with the establishment of pine seedlings in Georgia. DPI is currently conducting a delimiting survey of the surrounding area to determine the extent of the infestation. Steve Compton will present updated information on identification and discuss environmental impacts and current control strategies.

**Biography**

Steve Compton is a native of upstate South Carolina and obtained a degree in biology from Presbyterian College. Steve has worked in agriculture, horticulture, and the greenhouse industry for more than 35 years. In 2004, Steve joined Clemson University's Department of Plant Industry and is currently working to slow the spread of regulated invasive species in South Carolina and surrounding states. Steve spends much of his time educating industry and the private sector in identification and potential pathways of harmful organisms which adversely affect agriculture and trade.

**SELECTIVE TORPEDOGRASS (PANICUM REPENS L.) CONTROL IN AQUATIC AND RIPARIAN AREAS**

**Presenter**

Stephen F. Enloe, Extension Weed Specialist, Center for Aquatic and Invasive Plants, University of Florida; 7922 NW 71st St. Gainesville, Fl 32653; 352.339.1319; sfenloe@ufl.edu

**Abstract**

Invasive grasses are a major threat to many aquatic and riparian systems across the southeastern United States. Species such as torpedograss (*Panicum repens*) often form dense monotypic stands that are very difficult to selectively control. Sethoxydim is a grass-selective herbicide that received an experimental use permit for aquatic sites in Florida in 2015. Sethoxydim has considerable promise for controlling many troublesome species with minimal non-target damage. This talk will present the results of several mesocosm and field studies conducted in 2015 and 2016 that examined the effectiveness of sethoxydim applied alone and in combination with other herbicides for control of torpedograss.

**Biography**

Dr. Enloe earned his Ph.D at UC Davis in Plant Biology, a Master's degree in weed science from Colorado State University, and an undergraduate degree in Agronomy from NC State. Dr. Enloe has been involved with invasive plant research and extension for the past 19 years. He has worked throughout the western and southeastern United States, including California, Colorado, Wyoming, Alabama, and now Florida. His current focus at the IFAS Center for Aquatic and Invasive Plants as an Extension Specialist includes both upland and aquatic species. Key areas of research have included IPT methods for controlling Chinese privet, Chinese tallowtree, Chinaberry, and a host of other woody invasive plants.

**DISTINCTION WITHIN THE LUDWIGIA URUGUAYENSIS COMPLEX IN FLORIDA**

**Presenter**

Colette C. Jacono, PhD, Botanist, UF Center for Aquatic and Invasive Plants, 7922 NW 71st St, Gainesville, Florida 32653. Ph: 352.318.2931 Email: colettej@ufl.edu

**Co-authors**

Afsari Banu, Graduate Assistant, University of Florida, Agronomy Department/Center for Aquatic and Invasive Plants, 7922 NW 71st St., Gainesville, FL 32653; 777-5011, afsari@ufl.edu; Stephen F. Enloe, Associate
Abstract

Cytological and morphological analysis of representative accessions of the *Ludwigia uruguayensis* complex demonstrated that *L. hexapetala* and *L. grandiflora* are present and can clearly be separated as distinct species in Florida. Five accessions grown under common garden outdoor environments were assessed using chromosomes counts of digested root tip cells and flow cytometric estimation of leaf tissue nuclear DNA. Two main karyotype groups were delineated (2n=48 and 2n=80). Metrics of ten floral and ten vegetative character traits strongly supported separation of the two species, yet also set apart three distinct, stable types within *L. grandiflora*. One type is small with narrow leaves, two others are large with wide leaves. One of the large, wide leaf types is highly variable, strongly upright, extensively branching and severely invasive in the upper basins of two major rivers in Florida. Details will be presented for field managers to comfortably recognize *L. hexapetala* and *L. grandiflora* as well as other five-petaled *Ludwigia* species in the southeast.

Biography

Dr. Jacono has 20 years’ experience in the study of aquatic, invasive plants. She has managed the US Geological Survey’s national database for tracking nonindigenous aquatic plants, taught an undergraduate course on invasive species, and continues to research practical problems with the UF Center for Aquatic and Invasive Plants and through an appointment with the Florida Museum of Natural History. Dr. Jacono remains an active contributor to the FLEPPC Invasive Plant Listing Committee. Her interests lie in the floristics, taxonomy, and ecology of plants in our unique aquatic ecosystems in hopes to help retain native biodiversity.

PHENOTYPIC DIVERSITY AMONG COGONGRASS POPULATIONS AND RESPONSE TO GLYPHOSATE

Presenter

Nancy J. Loewenstein, Ph.D., Extension Specialist, School of Forestry and Wildlife Sciences and Alabama Cooperative Extension System, 3301 Forestry and Wildlife Sciences Building, Auburn University, AL 36849, 334.844.1061, loewenj@auburn.edu

Co-authors

Stephen F. Enloe, Ph.D., Associate Professor, Agronomy Department/Center for Aquatic and Invasive Plants, 7922 NW 71st St., Gainesville, FL 32653, 352.392.6841, sfenloc@ufl.edu Rima Lucardi, Ph.D., Research Ecologist, RWU 4552-Insects, Diseases, and Invasive Plants, USDA Forest Service, Southern Research Station, 706.559.4278, rlucardi@fs.fed.us; Dwight K. Lauer, Ph.D., Silvics Analytic, 122 Todd Circle, Wingate, NC 28174, 704.324.4129, dklauer.silvics@gmail.com; Afsari Banu, Graduate Research Assistant, Department of Agronomy, University of Florida, 7922 NW 71st St., Gainesville, FL 32653, 352.392.6841, Afsari@ufl.edu

Abstract

Land managers frequently struggle with cogongrass (*Imperata cylindrica*) control and report considerable variation in response to herbicide treatment. The reasons for this are unclear. However, research shows strong morphological differences and genetic variation among cogongrass sampled across Alabama and Mississippi. The objective of this study was to determine if these factors, focusing first on phenotype, contribute to variation in glyphosate efficacy. Cogongrass accessions, collected from over fifty locations across the southeast, were grown for six months in greenhouses at the University of Florida and Auburn
University. Pre-treatment data were then collected for each accession on tiller number, maximum leaf height and width, leaf canopy cover, total leaf area, and above ground and below ground biomass. Plants were then treated with glyphosate at 0, 1.5 or 3 lb a.i. per acre. Post-treatment data were collected on shoot dry weight at 30 days after treatment (DAT) and shoot and root/rhizome dry weight at 60 DAT. Cluster analysis was used to group accessions into morphological groups: 1) all characteristics average, 2) characteristics average with respect to tillers, leaf cover, and root weight but low for leaf height and shoot weight, 3) all characteristics above average and 4) all characteristics below average. We found a significant greenhouse interaction with morphological cluster and glyphosate rate. All cogongrass morphological clusters were effectively controlled by both glyphosate rates in Florida greenhouses. However, there was a slight but significant glyphosate rate response in plants in the average and above average clusters in one of the greenhouses. At Auburn, plants in the above average cluster which were also larger at the time of treatment were not as well controlled by glyphosate. While the majority of the data suggest that variability in glyphosate efficacy may be more environmentally and applicator driven than due to morphological differences, questions remain.

Biography
Nancy Loewenstein is an Extension Specialist with Auburn University School of Forestry and Wildlife Sciences and the Alabama Cooperative Extension System. She received a PhD in Physiological Ecology from the University of Missouri, a MS in Forest Biology from Virginia Tech and a BS in Forest Management from Auburn University. Her Extension efforts focus on invasive plant identification, ecology and control. She also teaches Dendrology (tree identification) for forestry and wildlife students. Nancy is currently serving as the Executive Director of the Alabama Invasive Plant Council and Chair of the National Association of Invasive Plant Councils. She is also serving on a national task group developing an ASTM standard for invasive plant listing.

BARBARIANS AT THE GATES: THE FEDERAL NOXIOUS WEED PREVENTION SURVEY AT THE PORT OF SAVANNAH

Presenter
Rima D. Lucardi, USDA Forest Service, Southern Research Station, 320 Green Street, Athens, GA 30602; 706.559.4278; rlucardi@fs.fed.us

Co-authors
K.S. Burgess, Associate Professor and Curator of the Herbarium, Columbus State University, Dept. of Biology, Lenoir Hall 163A, 4225 University Avenue, Columbus, GA 31907; C.E. Cunard, Post-Doctoral Research Associate, Arkansas State University, Dept. of Biological Sciences, and Arkansas State University Herbarium (STAR), P.O. Box 599, State University, AR 72467; T.D. Marsico, Associate Professor of Botany and Associate Chair, Curator of the Herbarium; J. Reed, Graduate Student, Arkansas State University, Dept. of Biological Sciences, and Arkansas State University Herbarium (STAR), P.O. Box 599, State University, AR 72467; L. Whitehurst Graduate Student, Columbus State University, Dept. of Biology, Lenoir Hall 163A, 4225 University Avenue, Columbus, GA 31907; Worthy, S.J. 2, Graduate Student, Columbus State University, Dept. of Biology, Lenoir Hall 163A, 4225 University Avenue, Columbus, GA 31907

Abstract
Increasing global connectivity and economic demand drives the international movement of goods, with over 90% of all trade conducted via trans-oceanic shipment. Major international seaports are gateways for these goods (or commodities), and include locations such as Shanghai, Los Angeles (LA/Long Beach), New York/New Jersey, Amsterdam, and Savannah. The southern region of the United States is experiencing significant economic growth, such as the recent expansions of the auto industry, heavy-equipment manufacturing, and agricultural imports and exports. Commodity exchange in the region expects to accelerate over the coming decades. The Port of Savannah is a key gatekeeper in the exchange of agriculture commodities, including, but not limited to, timber and timber products, poultry, and produce. Cooperative research among federal and state agencies and regional universities sought to assess rate, diversity, and frequency of hitchhiking propagules of Federally Listed Noxious Weeds during their entry into the United States. We identified one major agricultural commodity for the Port of Savannah requiring a temperature-controlled environment, and require transport utilizing refrigerated shipping containers. These climate-controlled shipping containers each possess its own refrigeration equipment, producing a nexus of moving air, fans, and potential for troublesome wind-blown seeds to be caught up in its coils. We utilize a two-pronged
approach of morphological identification of plants and seeds and DNA barcodes to molecularly catalog accessions. Furthermore, we conducted floristic surveys on Port to assess relative baseline plant invasion. Thus far, we have found 32% of plants collected at the Port of Savannah are non-native, suggesting these gateways, with high-level anthropogenic and continuous disturbances, are hotspots for non-native plant diversity. On-going determination of propagules are underway, and we have discovered substantial variability across the entirety of Season 1 data. These data will be utilized for real-time and measurable propagule pressure of invasive plants at the South’s largest international gateway.

Biography
Rima Lucardi is the Research Ecologist for the US Forest Service research unit Insects, Diseases, and Invasive Plants. She received her Ph.D. in Biological Sciences from Mississippi State University and her B.S. in Biology from the University of Texas at Arlington. Her research has primarily focused on the exotic, highly invasive plant, cogongrass (Imperata cylindrica), utilizing interdisciplinary approaches, including genetics, ecology, and evolutionary biology. The current research program explores invasion and conservation biology of plants, and the occasional insect or pathogen. Dr. Lucardi is an active member of the Southeast Exotic Pest Plant Council and Ecological Society of America, and retired from roller derby in 2012. For more information: http://www.srs.fs.usda.gov/staff/412.

DISTRIBUTION AND MANAGEMENT OF PHRAGMITES AUSTRALIS IN THE SOUTHEASTERN US: IMPLICATIONS FOR FLORIDA

Presenter
Carrie Reinhardt Adams, Associate Professor, Environmental Horticulture, University of Florida, PO Box 110675, Gainesville, FL 32611, rein0050@ufl.edu

Co-authors
Candice M. Prince, PhD Graduate Fellow, Environmental Horticulture, University of Florida, PO Box 110675, Gainesville, FL 3261; Allison Bechtloff, Graduate Student Researcher, Environmental Horticulture, University of Florida, PO Box 110675, Gainesville, FL 32611; Leah C. Lee, PhD Graduate Fellow, Environmental Horticulture, University of Florida, PO Box 110675, Gainesville, FL 3261; Andraya Mendez, Undergraduate Researcher, Environmental Horticulture, University of Florida, PO Box 110675, Gainesville, FL 32611

Abstract
Phragmites australis replaces wetland vegetation in critical habitats throughout the United States, including the southeast (SE-EPPC-listed in all states but FL), where it decreases habitat quality, disrupts biogeochemical cycles, and alters geomorphic processes. While there is a native lineage of Phragmites in North America, several exotic lineages introduced over the past 150 years have become invasive. The invasive Eurasian haplotype M was not detected in Florida as of 2010, but was detected 40 miles to the north and 60 miles to the west in Georgia and Mississippi. In 2013 a small haplotype M patch was identified in Pinellas County, FL. Also, the Gulf Coast haplotype I has become aggressive in certain disturbed Florida wetlands, where it is currently being managed.

Eradiation of Phragmites is uncommon, despite the high cost of control programs; increased control efforts do not improve long-term ecological benefits in many scenarios. Biological control is not feasible, so questions about the most effective cultural and chemical control, as well as post-control revegetation, have heightened relevance. Specifically, how should management proceed in novel environments such as Florida saltmarshes and riparian wetlands? Also, how should control strategy vary with haplotype and wetland type? A competition study found that haplotype M suppressed Florida genotypes of Juncus roemerianus under both submergent and emergent conditions in brackish water, but increasing J. roemerianus density increased Phragmites suppression. From a competition study comparing establishment of both haplotypes within stands of J. roemerianus, haplotype M was shown to better suppress J. roemerianus than haplotype I. Herbicide trials found Phragmites haplotypes show differential susceptibility to herbicide applications, with haplotype I showing less injury for all treatments than haplotype M. Research testing revegetation techniques, including follow-up herbicide control, is the next logical step to develop predictive information for Phragmites management.

Biography
Carrie Reinhardt Adams is an Associate Professor in the Environmental Horticulture Department at the University of Florida in Gainesville. Her work emphasizes invasive species control and the subsequent transition to native
plant community restoration, particularly with problematic perennial species in wetlands across the US. She focuses on collaborative work with practitioners, and has worked in Pennsylvania, Virginia, the upper Midwest US, Ecuador, and now Florida.

THE RIGHT CHEMICAL FOR THE RIGHT JOB

Presenter
Scott Frock, Manager Marshfield Forestry Service Inc, 725 Shiloh Rd, Saluda SC 29138, scottfrock1@gmail.com

Abstract
Herbicides vary in their effectiveness against different plants; some are more destructive than you need and some will not be sufficient for the job required. Scott Frock will present on selecting the right herbicide to get the job done with the least negative impact on the environment.

Biography
Scott Frock has 22 years’ experience with reforestation and weed control, including with Eller and Sons, Frocks Forestry and Farm and for the US Forest Service SRS Red-cockaded Woodpecker habitat improvement, US Forest Service selected hardwood species control and release, chainsaw hardwood release, NNIS control projects on small 1-15 ac old home sites, and large tracts 100’s of acres and up of river flood plain, riparian and adjacent areas. He has treated more than 7,000 acres of privet, kudzu, Chinese tallow, wisteria and others. His current responsibilities include exhaustive responsibility for herbicide selection, application methods, and quality control for all NNIS species.

FIELD TRIPS

HACK-AND-SQUIRT DEMONSTRATION ON GLOSSY-LEAVED PRIVET AT GREEN’S SHELL RING IN HILTON HEAD

Presenter
Stephen F. Enloe, Center for Aquatic and Invasive Plants, University of Florida

About hack and squirt
“Hack and squirt” is a widely used individual plant treatment technique. However, there is tremendous diversity in exactly what is meant and what is done with this technique. We will review different types of hack and squirt treatments, tools, and herbicides used. Field demonstrations will be conducted on multiple woody invasive plants and audience participation and discussion will be strongly encouraged. Comparisons with other IPT methods in terms of efficacy, efficiency, and cost will also be discussed. If you love slasher movies and running madly through the woods with a machete, this field trip is for you!

Location - Green’s Shell Ring, Hilton Head, S.C.
Green’s Shell Enclosure (Department of Natural Resources Heritage Preserve) is a low earthen embankment, two to six feet high, that dates back to the Irene Period of 1300 to 1450 A.D. Covering two acres, this embankment was once a fortified village built by farmers who used shells for everything from tools to objects used for religious rituals. Planning is underway concerning the exotic Ligustrum lucidum that now dominates much of the preserve.

Biography
Dr. Enloe earned his Ph.D at UC Davis in Plant Biology, a Master’s degree in weed science from Colorado State University, and an undergraduate degree in Agronomy from NC State. Dr. Enloe has been involved with invasive plant research and extension for the past 19 years. He has worked throughout the western and southeastern United States, including California, Colorado, Wyoming, Alabama, and now Florida. His current focus at the IFAS Center for Aquatic and Invasive Plants as an Extension Specialist
includes both upland and aquatic species. Key areas of research have included IPT methods for controlling Chinese privet, Chinese tallowtree, Chinaberry, and a host of other woody invasive plants.

**SPRING ISLAND ECOSYSTEM MANAGEMENT TOUR AT SPRING ISLAND COMMUNITY**

**About Spring Island**
Spring Island is a rich amalgamation of habitats, thanks to its unique coastal topography and history of human use. With 19 different kinds of soils ranging from dry sandy ridges to wetlands, the island’s 3,000 acres are home to over 600 species of plants. The longleaf pine here tells of a past when periodic ground fires, created by lightning, once swept through the undergrowth. Today, the Spring Island Trust is working to restore this disappearing habitat by replanting old fields with young longleaf pine and maintaining a first-rate prescribed burn program. At the south end of the island, you’ll find species originating from an ancestral hardwood bottomland swamp that surrounded the island 13,000 years ago. Here, spruce pine, bluff oak and the spectacular mottled trillium occur along bluffs with soils rich in oyster shells discarded by Native Americans thousands of years ago. Other species, normally associated with Piedmont and mountain regions, are just a stone’s throw from the salt marsh. The most species-rich forests stretch around the perimeter of the island, where water-loving trees like tulip poplar and swamp tupelo extend their roots. Rare palms, sedges and ferns reside within the deep shade of these forests.

**AQUATIC PLANT ID WORKSHOP: IN THE HOTEL MEETING SPACE**

**Presenter**
Rob Emens, Manager, NC Aquatic Weed Control Program, NC Division of Water Resources, 1611 MSC, Raleigh, NC 27699-1611; 919.707.9012, Rob.emens@ncdenr.gov

**Biography**
Rob has managed the Aquatic Weed Control Program for the state of North Carolina since 2003. The State-funded program provides assistance to agencies, local governments, public utilities, and citizens who are dealing with noxious/invasive aquatic vegetation infestations. Rob has become a primary person to contact for all aquatic invasive species (AIS). He represents the State of NC on regional panels of the Aquatic Nuisance Species Taskforce, has held officer and/or board of director positions for the NC Invasive Plant Council, SC Aquatic Plant Management Society, and serves as chairperson for the NC Aquatic Weed Control Council.

Rob received B.S. degrees in Aquaculture and Marine Biology from the Florida Institute of Technology. Shortly after graduating he served as an observer for NMFS working on commercial fishing boats in Alaska then returned to Florida where his career in lake and pond management/restoration began. He has been working in the lake management industry now for ~15 years and is currently one of North Carolina’s top experts in aquatic weed management.
PRESENTATIONS
FRIDAY, SEPT. 16

UTILIZATION OF UN-MANNED AERIAL SYSTEMS (UAS) FOR VEGETATION MAPPING AND RESTORATION

Presenter
Jon Morton, Biologist, Invasive Species Management Branch, US Army Corps of Engineers, Jacksonville District, Restoration Program Office, 1400 Centrepark Blvd, Suite 750, West Palm Beach, FL 33401; 904.233.0852, Jon.m.morton@usace.army.mil

Abstract
The Jacksonville District of the USACE has been exploring the use of Unmanned Air Systems (UAS) since 2005 to gain spatially accurate, very high-resolution imagery (~3cm) for the detection and monitoring of select invasive species and to support ecosystem restoration efforts. Now that the imagery acquisition part of the UAS program is fully operational, the focus is on assessing and quantifying the data within the images for a variety of different invasive species and vegetative community mapping projects. This presentation will give a background of the Corps’ use of UAS and some of the current technologies and challenges associated with image acquisition, processing, and analysis.

Biography
B.S. Wildlife Science, Mississippi State University; Worked for the Invasive Species Management Branch of USACE since 2005; Interests with UAS include mapping and analysis of natural area communities; invasive species detection and monitoring; and exploring emerging technologies in automatic classification of high resolution imagery.

“WILD PLANTS ON THE RABBIT” AND REACHING THE UNCHURCHED...

Presenter
Jane K. Marlow, 17 Ashley Ct, Travelers Rest, SC 29690; 864.420.4309, webmaster@namethatplant.net

Abstract
Preaching to the choir? Not this time. When pondering how to broaden the public’s awareness of native plants and invasive species, the SC Native Plant Society (with the help of supporters like SC-EPPC) decided to take advantage of the Upstate’s popular Swamp Rabbit Trail. This trail extends almost 20 miles, passing through the center of downtown Greenville along the way, and is used by thousands of people—walking, pushing a stroller, pushing a walker, cycling, running, skateboarding, even a few riding unicycles. It’s a wonderfully diverse audience, all right here and already outside, face-to-face with whatever plants are growing wild on the trail. The Swamp Rabbit Trail snakes along the route of an old railroad and, for much of its distance, parallels the Reedy River, providing glimpses of exuberant native wildflowers and exposing heretofore hidden (and ignored) infestations of invasive plants. Enter “Wild Plants on the Rabbit”, a guide to the Trail’s wildflowers, trees, shrubs, vines and grasses—but not just any guide, a guide designed to encourage Trail users to pay attention to the identity of the plants taking over our green spaces. Come see what makes this guide special, and how you can do something similar for a greenway near you.

Biography
Janie Marlow is a member of the SC Native Plant Society and creator of the web resource www.NameThatPlant.net, an approachable storehouse of information about native and naturalized plants of the Carolinas and Georgia. Inspired by Jacques-Yves Cousteau’s assertion: “People only protect what they love, but they can only love what they know”, the website strives to make knowledge of our local flora accessible to a broad spectrum of viewers.
DEVELOPMENT, IMPLEMENTATION AND OUTCOME OF A VOlUNTEER-BASED SURVEY FOR HYDRILLA IN THE CHOWAN RIVER AND ALBEMARLE SOUND, NORTH CAROLINA

**Presenter**
Rob Emens, Manager, NC Aquatic Weed Control Program, NC Division of Water Resources
1611 MSC, Raleigh, NC 27699-1611; 919.707.9012, Rob.emens@ncdenr.gov

**Abstract**
This presentation will be a review of how volunteers are being utilized to survey a geographically large-scale project. In 2010, hydrilla, an invasive aquatic plant, started to impact the recreational use of man-made canals along the Chowan River and Albemarle Sound. The presence of hydrilla in this part of North Carolina had not been well documented prior to that time and was generally assumed to not be present within the Chowan River or Albemarle Sound. A delimiting survey was a necessary first step to gain an understanding of the magnitude of the infestation. Due to the vast area that required presence/absence sampling, local watermen and recreational boaters were recruited to help gather data. Local training workshops were organized to provide volunteers with basic SAV identification and sampling skills. Equipment was purchased, including SAV sampling rakes and tablets loaded with an application that was custom designed to log data in the field. This project is an example of how volunteers (similar to the citizen scientist model) can be effectively trained to gather specific field data. Local training workshops were organized to provide volunteers with basic SAV identification and sampling skills. Equipment was purchased, including SAV sampling rakes and tablets loaded with an application that was custom designed to log data in the field. This project is an example of how volunteers (similar to the citizen scientist model) can be effectively trained to gather specific field data; specifically, in this case volunteers closed the gap that existed due to agency resource limitations. The exercise provided significant man-hours, important data and facilitated public awareness of the emerging hydrilla issue in the area.

**Biography**
Rob has managed the Aquatic Weed Control Program for the state of North Carolina since 2003. The State-funded program provides assistance to agencies, local governments, public utilities, and citizens who are dealing with noxious/invasive aquatic vegetation infestations. Rob has become a primary person to contact for all aquatic invasive species (AIS). He represents the State of NC on regional panels of the Aquatic Nuisance Species Taskforce, has held officer and/or board of director positions for the NC Invasive Plant Council, SC Aquatic Plant Management Society, and serves as chairperson for the NC Aquatic Weed Control Council.

Rob received B.S. degrees in Aquaculture and Marine Biology from the Florida Institute of Technology. Shortly after graduating he served as an observer for NMFS working on commercial fishing boats in Alaska then returned to Florida where his career in lake and pond management/restoration began. He has been working in the lake management industry now for ~15 years and is currently one of North Carolina’s top experts in aquatic weed management.

THE UPSTATE MASTER NATURALIST CLEMSON MEADOW RESTORATION PROJECT

**Presenter**
Cindy Hekking, 151 Vallee Dr., Central, SC 29630; 864.639.4677, cyndieneman@att.net

**Co-author**
Ric Barnett, 366 S Buckhorn Rd, Greenville, SC 29609; 864.77.8225, RichardB153@gmail.com

**Abstract**
The Clemson Meadow project came into existence back in 2008 when some newly minted graduates of the Upstate Master Naturalist Program, in search of a worthwhile object for fulfilling their volunteer hour requirements, hit upon the plan of restoring an overgrown, invasive filled, 17 acre patch of the Clemson Forest back to the type meadow ecosystem. There were many non-native and, in some cases, rampantly invasive species that occupied large patches of the Clemson Meadow and considerable amounts of old forestry debris. The graduates of the UMNA have put many hundreds of hours into the removal of trash and invasive plants.

The change that has already taken place is dramatic. In addition to ongoing invasive plant removal, a series of informational signs are being installed. In progress are a kiosk teaching folks about the importance of meadow ecosystems and an invasive plant educational walk. Through the work of a small army of master naturalists and other volunteers, a solid vision and plan is in place to achieve what could be; a beautiful, fully functioning meadow ecosystem and a teaching tool to help folks
better understand and care for meadow habitat across the Upstate.

**Biography**
Graduate of Clemson University with a BS in Aquaculture, Fisheries and Wildlife Management. 2014 Graduate of the Upstate Master Naturalist Program and the current Clemson Meadow Restoration Project Coordinator.

**JUNIOR INVASIVE INSPECTOR PROGRAM**

**Presenter**
Katie Moore, Program Coordinator, Clemson Regulatory Services, 511 Westinghouse Rd., Pendleton, SC 29670, 803.417.5198, kcrouch@clemson.edu

**Abstract**
The Junior Invasive Inspector Program engages middle and high school youth in a citizen science survey program. The program teaches youth groups about invasive pests and provides them with the training and tools to design and conduct pest detection surveys in their own communities. Enlisting the help of youth provides valuable volunteer survey manpower that regulatory agencies desperately need to combat invasive species. Local citizens are critical to detecting and preventing the spread of invasive insects and diseases. Alert and informed community members are often the first to report new detections and infestations in the US. All citizens are important in preventing the spread of invasive species, but young teens can play an especially important role. By engaging them in inquiry-based learning, they will be poised to carry that information and curiosity into adulthood. Providing youth with the tools and knowledge to become involved in invasive pest activities benefits the plant pest regulatory agencies by providing much needed volunteer surveyors to inspect and report. Additionally, the youth will become more involved in the conservation of the natural world thereby encouraging lifelong stewardship of the environment. The program is an interactive and hands-on learning project. The students get survey backpacks and go out into the forests to survey for pests. The leader or teacher is given the curriculum to teach the youth and is also given a leader backpack with necessary supplies. Junior Invasive Inspector Program is made possible through a Farm Bill grant. There are now a couple of other states that want to do this project in their own states and we are willing to help them any way possible.

**Biography**
Katie Moore is a Program Coordinator for Clemson University Regulatory Services. Katie received her bachelors and Masters in Agricultural Education through Clemson University. She was an agriculture teacher for five years before coming to Regulatory. Katie has been with Regulatory just over a year and now oversees a couple of grants and does special projects for the Director.

**HERBICIDE LABEL INTERPRETATION IN RIPARIAN AREAS**

**Presenter**
Stephen Enloe, Extension Weed Specialist, Center for Aquatic and Invasive Plants, University of Florida; 7922 NW 71st St. Gainesville, Fl 32653; 352.339.1319; sfenloe@ufl.edu

**Abstract**
A strong knowledge and understanding of herbicide labels is paramount to effective weed control in riparian and aquatic areas. Over the last decade, several new herbicides have been registered for use in these sites. However, there is still considerable uncertainty in herbicide label interpretations for many products, especially when treating upland vegetation near water and when treating emergent, marginal weeds in water. This talk will focus on several herbicide label issues and will test audience knowledge through an interactive quiz format. It is of utmost importance that applicators stay current on herbicide labels and understand the key issues that may greatly benefit weed management programs in aquatic and riparian areas.

**Biography**
Dr. Enloe earned his Ph.D at UC Davis in Plant Biology, a Master’s degree in weed science from Colorado State University, and an undergraduate degree in Agronomy from NC State. Dr. Enloe has been involved with invasive plant research and extension for the past 19 years. He has worked throughout the western and southeastern United States, including California, Colorado, Wyoming, Alabama, and now Florida. His current focus at the IFAS Center for Aquatic and Invasive Plants as an Extension Specialist includes both upland and aquatic species. Key areas of research have included IPT methods for controlling
Chinese privet, Chinese tallowtree, Chinaberry, and a host of other woody invasive plants.

INVASIVE PLANTS IN SOUTH CAROLINA: IDENTIFICATION, REPORTING AND CONTROL

Presenter
Bill Steele, President of the SC EPPC and Facility and Resource Manager of the Anne Springs Close Greenway in Fort Mill, SC, billsteele@ascgreenway.org

Abstract
An overview of the invasive plants in our state with literature to assist in identification, reporting and control. The plants will be categorized as severe, significant, or emerging threats. Comparison will be made of the native black walnut and invasive tree-of-heaven. A description of the Early Detection and Rapid Response and the Early Detection and Distribution Mapping systems will be presented. A synopsis of control efforts at the Anne Springs Close Greenway will be given.

Biography
Bill Steele is the Facility and Resource Manager of the Anne Springs Close Greenway in Fort Mill, SC. Bill is a native of Lancaster, S.C. He earned a Bachelor’s degree and Masters of Science in Forest Management from Clemson University. He has held positions with Clemson University as Research Specialist, and with the NC Forest Service and SC Forestry Commission as Land Owner Assistance Forester and Water Quality Forester. Bill is President of the SC Exotic Pest Plant Council, Past President of the SC Horsemen’s Council and Chair of the Old Hickory Chapter of the Society of American Foresters. He is a Registered Forester in North and South Carolina, Certified Prescribed Fire Manager, Fort Mill Rotarian, Master Pond Manager and serves on the technical advisor committee of the Nation Ford Land Trust and York County Clemson Extension Advisory Board. Bill is married with a son and daughter and enjoys fly fishing, hunting, and spending time with his family. He is an active member of Forest Hill Church in Fort Mill.

INVASIVE PLANT EDUCATION – INVADING A CLASSROOM NEAR YOU!

Presenter
Dehlia Albrecht, Education Initiative Coordinator,

University of Florida/IFAS Center for Aquatic and Invasive Plants, PO Box 110610, Gainesville, FL 32611

Abstract
For the past 11 years, the University of Florida/IFAS Center for Aquatic and Invasive Plants (CAIP) has been collaborating with teachers to develop educational curricula for grades 2 through 12 on the topic of invasive plants and plant management. Two key components of these outreach efforts are a 5-day teacher training workshop, Plant Camp, and on-site classroom demonstrations of Lakeville – A Natural Resource Management Activity. These activities were developed with the goal of motivating educators and outreach specialists to learn more about invasive species and then bring their new knowledge back to classrooms, workshops, associations, or other venues serving current and future citizens. This presentation will provide an overview on CAIP, Plant Camp and Lakeville, and present key findings from our pre- and post-test results and evaluations from both Plant Camp and Lakeville.

Biography
Dehlia works for the UF/IFAS Center for Aquatic and Invasive Plants, where she coordinates the Florida Invasive Plant Education Initiative, including the organization and preparation for an annual 5-day teacher workshop, and the preparation and dissemination of Education Initiative curricula about invasive plants for grades 2-12. She also assists with other outreach efforts for the Center. Dehlia earned a Bachelor’s degree in Biology from Aurora University and a Master’s degree in Entomology and Nematology from University of Florida. She has had experience in curriculum development and assessment, teaching in formal and informal educational settings, public outreach, evaluating program outcomes, and in conducting biological field and laboratory research.

RESPONSE OF PHRAGMITES AUSTRALIS (COMMON REED) HAPLOTYPES TO HERBICIDE TREATMENT

Presenter
Candice M. Prince, Ph.D. Student. Environmental Horticulture Department, University of Florida, P.O. Box 110675, Gainesville, FL 32611; 321.446.1035 cprince14@ufl.edu
Co-authors
Dr. Stephen F. Enloe, Associate Professor. Agronomy Department, University of Florida, Center for Aquatic and Invasive Plants, 7922 NW 71st St., Gainesville, FL 32653; 352.392.6841 sfenloe@ufl.edu; Dr. Gregory E. MacDonald, Professor. Agronomy Department, University of Florida, P.O. Box 110500, Gainesville, FL 32611; 352.294.1594 pineacre@ufl.edu; Dr. Carrie Reinhardt Adams, Associate Professor. Environmental Horticulture Department, University of Florida, P.O. Box 110675, Gainesville, FL 32611; 352.273.4502, rein0050@ufl.edu

Abstract
*Phragmites australis* (common reed) has replaced acres of wetland plant communities throughout North America, altering important ecosystem services and wildlife habitat. This species is divided into haplotypes, with both native and exotic haplotypes present in the United States. Two haplotypes have recently presented management concerns in Florida: Haplotype M, an aggressive invader from Eurasia that was first identified in the state in 2013, and haplotype I, which has unclear origins but has recently become aggressive in disturbed freshwater wetlands throughout the state. We conducted a preliminary herbicide trial to evaluate the response of both haplotypes to three foliar herbicide treatments (1 lb-a.i./acre imazapyr, 0.5 lb-a.i./acre imazamox, and 0.47 lb-a.i./acre sethoxydim) under greenhouse conditions. The haplotypes exhibited differential response to herbicide treatment, with haplotype M showing significantly greater response to all three treatments than haplotype I at 60 days after treatment. Imazapyr treatments had a significantly greater effect on haplotype M in a visual evaluation than on haplotype I (91.5% versus 38.75%, respectively). The same significant relationship was also found with imazamox treatments (96.5% for haplotype M compared to 9% for haplotype I), and sethoxydim treatments (85% for haplotype M compared to 24.25% for haplotype I). All three herbicide treatments resulted in a significant difference from the untreated control for haplotype M (0.75% damage), while for haplotype I only imazapyr and sethoxydim treatments resulted in a significant difference from the control (6.25%). Differences in haplotype response to treatment may be due to morphological differences; plants of haplotype I were taller, and with fewer leaves and lateral stems, than those of haplotype M at the time of treatment. These results suggest that different management strategies may be required for each haplotype, and that further research under field conditions is merited.

Biography
Candice is a graduate student at the University of Florida. She received her undergraduate degree from the University of Florida in 2014, where she majored in Plant Science with a specialization in Restoration Horticulture. She is currently working towards the completion of her Ph.D. in Horticultural Sciences, for which she is studying invasive grass biology and management with her advisor Dr. Greg MacDonald.

GOATS REMOVING INVASIVE PLANTS – EFFECTIVE, EDUCATIONAL, OR BOTH?

Presenter
Julia Riley, Undergraduate Student, Wildlife and Fisheries Biology Program, Department of Forestry and Environmental Conservation, Clemson University; (865)-318-1819, jgriley@g.clemson.edu

Co-authors
Alicia Mcalhaney, graduate research assistant, School of Renewable Natural Resources, Louisiana State University; (803)-942-3722, amcalh1@lsu.edu; Carolyn Lanza, Biological technician (invasive plants), Malheur National Forest; 313.969.7318, clanza@clemson.edu; Dr. Donald Hagan, Assistant Professor of Forest Ecology, Forestry and Environmental Conservation Department, Clemson University; 864.656.7333, dhagan@clemson.edu; Jeremy Pike, Aquatic Scientist, Forestry and Environmental
Conservation Department, Clemson University; 864.656.306, pike@clemson.edu; Dr. Calvin Sawyer, Associate Professor, Department of Agricultural and Environmental Sciences, Clemson University; 864.656.4072, calvins@clemson.edu

Abstract
The Hunnicutt Creek Restoration Project is an ongoing student/faculty research effort started in 2013 with the goal of re-establishing natural functions and conditions of a degraded watershed on Clemson University’s main campus. Monitoring and removal of invasive species, primarily Chinese privet and silverthorn, within the upper reaches of the watershed is an important step toward restoring the ecosystem. We established thirty 5x5 meter plots, using the Carolina Vegetative Survey protocol, to measure the effectiveness of various removal techniques (chemical, mechanical, mechanical & chemical, and prescribed grazing). Five plots were randomly assigned to each of these treatments in addition to five control plots. Results indicate that the chemical & mechanical treatment was the most effective at consistently reducing cover and stem count of invasive species, followed by the chemical treatment. The goats were effective in temporarily opening up the landscape, but we observed vigorous regrowth in the year following goat deployment. As an independent treatment, goats were not effective within our 18mo study; however, the goats could create a larger impact if combined with chemical or mechanical & chemical treatments. Despite the goats’ limited reduction of invasive species within our study, their presence brought positive attention to the invasive species removal project and provided more opportunities to educate the university community on invasive plants within urban watersheds.

Biography
Julia Riley is an upcoming junior wildlife biology and fisheries science student at Clemson University, SC. During her time there, she has participated in an ongoing restoration and invasive plant research group, and is currently in the process of publishing a paper pertaining to that work. Julia is looking to continue her education with a master’s degree or more, but is considering the Peace Corps before beginning graduate school.

ON THE BEATEN PATH: TRAILS AND ROADS FACILITATE PLANT INVASION IN MULTI-USE FOREST

Presenter
Preston Durham, Graduate Student, College of Agriculture, Forestry and Life Sciences, Clemson University, Clemson, SC, wpdurha@g.clemson.edu

Co-authors
Natalie Bock, College of Agriculture, Forestry and Life Sciences, Clemson University, Clemson, SC; 704.910.9138, nbock@clemson.edu; William Durham, College of Agriculture, Forestry and Life Sciences, Clemson University, Clemson, SC; 864.404.9079, wpdurha@clemson.edu; Shay D. Sayers, College of Agriculture, Forestry and Life Sciences, Clemson University, Clemson, SC; 864.640.1267, ssayers@clemson.edu; Alison H. Rehfus, College of Agriculture, Forestry and Life Sciences, Clemson University, Clemson, SC; 864.656.0191, tmstame@clemson.edu; Dr. Donald Hagan (corresponding author) Department of Forestry and Environmental Conservation, Clemson University, 212 Lehotsky Hall, Clemson, SC 29634; 864.656.7333, dhagan@clemson.edu; Dr. Luke Flory, Department of Agronomy, University of Florida, flory@ufl.edu

Abstract
The spread of exotic invasive plant species is major issue in multiple use forests throughout the United States. In the Clemson Experimental Forest, invasive plant species are commonly found near trailheads and alongside roads and trails. However, the ecological mechanisms that explain these patterns of invasion are not well understood. We conducted a study to determine if anthropogenic activity on trails and roads resulted in increasing the spread of these invasive species. Our results indicate that most exotic invasive species decreased in cover with increasing distance from trails and roads, and this was especially true of Japanese stiltgrass (Microstegium vimineum). In order to research the patterns of Japanese stiltgrass invasion further, we conducted an experimental addition study to determine which trail users’ disturbance (hikers, bikers and horseback riders) might be contributing to its establishment. An improved understanding of exotic invasive species in multiple use forests will allow forest managers to predict where the invasive species are most likely to establish, thereby enabling them to more efficiently respond to this growing issue.

Biography
Preston Durham is a senior Forest Resource Management
Salt Marsh Restoration - Planting Juncus Roemerianus for Phragmites Invasion Resistance

Presenter
Allison Bechtloff - Graduate Researcher - University of Florida – Environmental Horticulture Department, 511 NW 54th Terrace, Gainesville, FL 32607  Ph: 386-405-3377  email: abechtloff@ufl.edu

Co-authors
Carrie Reinhardt Adams, PhD. – Associate Professor – University of Florida – Environmental Horticulture Department – Restoration and Plant Ecology Lab P.O. Box 110670, Gainesville, FL 32611-0670  Ph: 352-273-4502  email: rein0050@ufl.edu; Candice Prince – Graduate Researcher – University of Florida – Environmental Horticulture Department, P.O. Box 110500, Gainesville, FL 32611-0500  Ph: 321-446-1035  email: cprince14@ufl.edu; Leah Cobb Lee – Graduate Researcher – University of Florida – Environmental Horticulture Department, P.O. Box 110670, Gainesville, FL 32611-0670  Ph: 850-512-3259  email: leahcobblee@ufl.edu

Abstract
Coastal salt marshes, with their unique plant communities, facilitate critical ecosystem services such as wildlife habitat and protection during stormwater surges. Many of these services have been threatened by stressors associated with urbanization and climate change in recent years, including invasive species. Phragmites australis is common in wetlands across North America, with both native and invasive haplotypes present in the United States. Haplotype M from Eurasia is a major invader of coastal salt marshes, where it excludes native plants, altering hydrology, and otherwise making the system uninhabitable for other species. Haplotype M has yet to invade Florida, but has been found nearby in coastal Georgia and Mississippi. The threat of invasion into Florida marshes from these locations may be exacerbated by climate change and sea level rise (SLR) scenarios unique to Florida coasts. A greenhouse competition experiment tested the resistance of new plantings of a native marsh species, Juncus roemerianus (two planting densities), to combinations of Phragmites invasion and (SLR) (two water levels). Phragmites exhibited the highest shoot density when planted alone, and was suppressed when planted with J. roemerianus. Phragmites was most suppressed at the deeper water level. Juncus roemerianus grew similarly across all treatments but outcompeted Phragmites in the deeper water level. These results suggest that revegetating newly restored wetlands with high densities of J. roemerianus may confer resistance to Phragmites invasions. Further research is merited to determine the relationship of native and invasive plants under conditions of SLR.

Biography
Allison was brought to research after spending much time in the Florida landscape while growing up in Ormond Beach, Fla. There, she found fewer and fewer native plants and pollinators which was very troubling. When she came to the University of Florida and the Restoration & Plant Ecology Lab, she became absorbed with the idea of planting native plants in order to maintain diversity in ecosystems. She feels that research facilitated in a university setting is capable of changing the decline in native plants and to help give them a fighting chance in a changing climate. Allison is currently working on her Master’s degree under Dr. Tom Yeager and will be focusing on courses to help prepare her to be a better communicator and teacher for her career in the extension service.