Florida Exotic Pest Plant Council (FLEPPC)
Southeast Exotic Pest Plant Council (SE-EPPC)
A Joint Annual Symposium
www.fleppc.org | www.se-eppc.org

May 21-23, 2013
Edgewater Beach & Golf Resort
Panama City Beach, Florida
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South Carolina
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## PROGRAM SCHEDULE

### Monday, May 20

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>NOON</td>
<td>Registration Begins – GRAND PALM F</td>
</tr>
<tr>
<td>1:00 PM</td>
<td>FLEPPC BOARD MEETING – SAGO 1</td>
</tr>
<tr>
<td>4:00 PM</td>
<td>Registration – GRAND PALM F</td>
</tr>
<tr>
<td>6:00 PM</td>
<td>SE EPPC BOARD MEETING – SAGO 1</td>
</tr>
</tbody>
</table>

### Tuesday, May 21 – GRAND PALM D & E

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>7:30 AM</td>
<td>Registration – GRAND PALM F</td>
</tr>
<tr>
<td>9:00 AM</td>
<td>Chair's Welcome Address and Announcements. <em>Dennis Giardina, Brian Arnold</em></td>
</tr>
<tr>
<td>9:30 AM</td>
<td>Keynote Speaker – <em>Damon E. Waitt, Ph.D.</em>, Senior Director Lady Bird Johnson Wildflower Center: <em>The Phantom Menace</em></td>
</tr>
<tr>
<td>10:15 AM</td>
<td>SE-EPPC Chapter Updates</td>
</tr>
<tr>
<td>10:40 AM</td>
<td>Break – GRAND PALM B</td>
</tr>
<tr>
<td>11:00 AM</td>
<td><strong>SESSION I</strong> GRAND PALM D &amp; E</td>
</tr>
<tr>
<td>10:55 AM</td>
<td>SE-EPPC Update on EPPC Invasive Plant Listing Methods, CWMA's and use of EDDMapS. <em>Brian Arnold</em></td>
</tr>
<tr>
<td>11:20 AM</td>
<td>Introduction to EDDMaps. <em>David Moorhead</em></td>
</tr>
<tr>
<td>11:30 AM</td>
<td>Lunch on your own</td>
</tr>
<tr>
<td>11:35 AM</td>
<td><strong>SESSION II</strong> GRAND PALM D &amp; E</td>
</tr>
<tr>
<td>1:15 PM</td>
<td>Apalachicola Regional Stewardship Alliance-CISMA: Benefits of Public-Private Cooperative Weed Management. <em>Brian Pelc</em></td>
</tr>
<tr>
<td>1:40 PM</td>
<td>Doing Things Differently: Tracking Invasive Exotic Plants in the Florida Park Service. <em>Gregg Walker</em></td>
</tr>
<tr>
<td>2:05 PM</td>
<td>The Florida Invasive Species Partnership – Working Together to Achieve Success. <em>Erin Myers, Kristina Serbesoff-King</em></td>
</tr>
<tr>
<td>2:30 PM</td>
<td>Billions and Billions of Dead Weeds – Florida’s Upland Invasive Exotic Plant Management Program. <em>Ruark Cleary</em></td>
</tr>
<tr>
<td>2:55 PM</td>
<td>Break – GRAND PALM B</td>
</tr>
</tbody>
</table>
### SESSION III  GRAND PALM D & E

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:10 PM</td>
<td>Six Rivers Cooperative Invasive Species Management Area (CISMA).</td>
<td>Brooke Saari</td>
</tr>
<tr>
<td>3:35 PM</td>
<td>Seven Years of Cooperation on Everglades Invasive Species Management, the ECISMA Experience.</td>
<td>Tony Pernas, LeRoy Rodgers</td>
</tr>
<tr>
<td>4:00 PM</td>
<td>IPC Web Solutions- Web Based Tools for Invasive Species Management.</td>
<td>Steven Manning</td>
</tr>
<tr>
<td>6:00 PM</td>
<td>WELCOME SOCIAL/POSTER SESSION/FISHING TOURNAMENT – GRAND PALM B</td>
<td></td>
</tr>
</tbody>
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**Wednesday, May 22**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Presenter</th>
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</thead>
<tbody>
<tr>
<td>7:30 AM</td>
<td>Registration – GRAND PALM F</td>
<td></td>
</tr>
<tr>
<td>8:00 AM</td>
<td>Addressing a Growing Risk: Minimizing the Potential for Bioenergy Feedstocks to Become Invasive.</td>
<td>Aviva Glaser</td>
</tr>
<tr>
<td>8:25 AM</td>
<td>Monitoring Private Contractors on Public Lands.</td>
<td>Linda King</td>
</tr>
<tr>
<td>8:50 AM</td>
<td>Taking the Lowcountry Back – the Story of Oak Grove and Chinese Tallow: Using Story in Mini-documentary to Educate Stakeholders about Invasive Plants.</td>
<td>Robin (Buz) Kloot, Sudie Daves Thomas</td>
</tr>
<tr>
<td>9:15 AM</td>
<td>Fifty Years after the Old World Climbing Fern Invasion.</td>
<td>Ken Langeland, Jeffrey Hutchinson, Melissa Smith, LeRoy Rodgers, Steve Smith</td>
</tr>
<tr>
<td>9:40 AM</td>
<td>2013 Update on the Florida Advocacy Group, Invasive Plant Management Association (IPMA).</td>
<td>Todd Olson</td>
</tr>
<tr>
<td>10:05 AM</td>
<td>Break – GRAND PALM B</td>
<td></td>
</tr>
<tr>
<td>SESSION VI</td>
<td>GRAND PALM D &amp; E</td>
<td>GRAND PALM A</td>
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<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>10:20 AM</td>
<td>Why we think EPPCs Should Include Invasive Exotic Animals in their Mission.</td>
<td>10:20am – 12pm:</td>
</tr>
<tr>
<td></td>
<td>Cheryl Millett, Erin Myers, LeRoy Rodgers, Sherry Williams</td>
<td>Invasive Plant Management Association (IPMA) Meeting</td>
</tr>
<tr>
<td>10:45 AM</td>
<td>Potential <em>Eucalyptus</em> Invasiveness in Florida’s Native and Modified Plant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Communities. <em>Kimberly A. Lorentz, Patrick J. Minogue</em></td>
<td></td>
</tr>
<tr>
<td>11:10 AM</td>
<td>EDDMaps Training</td>
<td></td>
</tr>
<tr>
<td>NOON</td>
<td>Field Trips (lunch provided for field trip attendees only)</td>
<td></td>
</tr>
<tr>
<td>6:00 PM</td>
<td>BANQUET – BIMINI BEACH (ocean-side)</td>
<td></td>
</tr>
</tbody>
</table>

Thursday, May 23

<p>| 7:30 AM       | Registration – GRAND PALM F                                                      |                                                                               |
|---------------|-----------------------------------------------------------------------------------|                                                                               |
| SESSION VII:  | Use of Prescribed Fire, Glyphosate and Seeding in Cogongrass Infested Longleaf    | Detection of Biotic Resistance to <em>Mikania micrantha</em> in Florida. Rodrigo Diaz,|
| – GRAND PALM A| <em>Stephen F. Enloe, Nancy J. Loewenstein, David Held, Lori Eckhardt, Dwight Lauer</em> |                                                                               |
| 8:00 AM       | Molecular Characterization of the Noxious Introduced Weed Species, <em>Imperata      | The Central Florida Lygodium Strategy: How Successful are we at Stopping the   |
|               | cylindrica</em> (L.) Beauv. (cogongrass), Using High-throughput Sequencing Technology  | Northern Spread of Old World Climbing Fern? <em>Cheryl Millett, Kris Serbesoff-King</em> |
|               | to Identify International Regions for Host-specific Biological Control Exploration  |                                                                               |
|               | and Development. <em>Millie Burrell, Allen Pepper, Patricia Klein</em>                    |                                                                               |
| 8:25 AM       |                                                                                   |                                                                               |</p>
<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speakers</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:50 AM</td>
<td>Use of Prescribed Fire, Glyphosate and Seeding in Cogongrass Infested Longleaf Pine Stands: Impacts on Species Relative Dominance.</td>
<td>Nancy J. Loewenstein, Stephen F. Enloe, Lori Eckhardt, David Held, Dwight Lauer</td>
</tr>
<tr>
<td></td>
<td>Effects of Climate Change on Florida Plant Communities – et tu, Invasive Species?</td>
<td>Chris Lockhart</td>
</tr>
<tr>
<td>9:15 AM</td>
<td>Cogongrass Invasion in Florida: What Does Genetic Data Reveal About Population Variation and Hybridization?</td>
<td>Rima D. Lucardi, Gary N. Ervin</td>
</tr>
<tr>
<td></td>
<td>Biological Control of Chinese Tallow; Results from Foreign Exploration and Host Testing.</td>
<td>Greg Wheeler, Sedonia Steininger, Chi Nguyen, Susan Wright, Ding Jianqing</td>
</tr>
<tr>
<td>9:40 AM</td>
<td>Current Status and Review of Cogongrass (Imperata cylindrica) Management in Florida.</td>
<td>Greg MacDonald</td>
</tr>
<tr>
<td></td>
<td>GRAND PALM D &amp; E FLEPPC Members Meeting – All Welcome</td>
<td></td>
</tr>
<tr>
<td>10:05 AM</td>
<td>Break – GRAND PALM B</td>
<td></td>
</tr>
<tr>
<td>10:45 AM</td>
<td>Prospects for biological control of cogongrass.</td>
<td>William A. Overholt, James P. Cuda</td>
</tr>
<tr>
<td>11:00 AM</td>
<td>Weed War II: AmeriCorps Attacks Invasive Plants in Florida State Parks.</td>
<td>Emily Schwerin, Andi Christman, Heather Grames</td>
</tr>
<tr>
<td>11:35 AM</td>
<td>Update From The IFAS Assessment of Non-Native Plants in Florida’s Natural Areas.</td>
<td>Deah Lieurance, Aimee Cooper, S. Luke Flory</td>
</tr>
<tr>
<td>NOON</td>
<td>Lunch on your own</td>
<td></td>
</tr>
<tr>
<td>1:15 PM</td>
<td>Effects of Defoliation on Growth and Reproduction of Brazilian Peppertree (Schinus terebinthifolius).</td>
<td>James P. Cuda, Lucinda Treadwell, William A. Overholt</td>
</tr>
<tr>
<td>1:40 PM</td>
<td>Lakeville from Florida to Georgia.</td>
<td>Karan A. Rawlins, Susan Reinhardt, Charles T. Bargeron, Kitty Lane</td>
</tr>
<tr>
<td>2:05 PM</td>
<td>Spatial Invasives Infestation and Prioritization Analysis (SIIPA) GIS Model.</td>
<td>Debi Stone</td>
</tr>
<tr>
<td>2:30 PM</td>
<td>Is West Indian Marsh Grass (Hymenachne amplexicaulis) Poised to take over Freshwater Wetlands of the Southeast?</td>
<td>Paula Benshoff, Jean Huffman</td>
</tr>
<tr>
<td>2:55 PM</td>
<td>Closing Remarks</td>
<td></td>
</tr>
</tbody>
</table>
FIELD TRIPS

Please choose one field trip. All field trips cost $25 and include a boxed lunch. Estimated time frame for all trips is noon to 5:00 PM, Wednesday, May 22nd. All field trips qualify for CEUs. We will carpool from the hotel for all trips. Restrooms are available at all sites.

**Recommended for all trips:**
- water
- sunscreen
- insect repellant
- hat
- boots or field shoes
- long-sleeved shirt
- long pants
- binoculars
- camera

**Note:** Field trip #2 will include a 45-minute demonstration on backpack and spot treatment calibration. Attendees will learn straightforward field methods to rapidly determine the effective per acre rate when doing spot and broadcast treatments in natural areas.

DESCRIPTIONS

**Point Washington State Forest**

*driving time: 35 minutes*

Point Washington State Forest is located in the southernmost portion of Walton County. The forest is approximately 9 miles south of Freeport on U.S. Highway 98. The forest is comprised of several natural communities that have very unique characteristics. The majority of the area consists of sandhills, basin swamps/Titi drains, wet flatwoods, wet prairie and cypress swamps.

Several plants and animals listed as threatened, endangered or species of special concern exist at Point Washington State Forest. Some of these rare species include American kestrel (*Falco sparverius*), gopher tortoise, flatwoods salamander, white-topped pitcher plant (*Sarracenia leucophylla*) and the world’s largest population of Curtiss’ sandgrass (*Calamovilfa curtissii*).

Some consider titi to be a “native invasive” species when it comes to land management issues. A biomass timber sale was initiated to help alleviate titi encroachment problems in various areas. A large population of cogon grass exists in a relatively unmanaged area along the spoil bank of the Intracoastal Waterway. Treatments have had little success.

**Topsail Hill Preserve State Park**

*driving time: 40 minutes*

Topsail Hill Preserve State Park is a 1600 acre coastal preserve located in Walton County between Destin and Panama City. It has the largest stretch of unbroken coastal scrub and dune habitat in the area. This makes it an ideal habitat for the endangered Choctawhatchee beach mouse as well as nesting shorebirds. The preserve also has a nice mixture of forested habitats, pine flatwoods, wet prairies, cypress dome swamps, scrub, and two globally imperiled coastal dune lakes. South Walton County has 15 of these unique lakes and Topsail is the only place where the lakes are wholly surrounded by conservation land. Miles of hiking trails afford park visitors the opportunity to pass through and experience all of the natural communities in the park and provide wonderful viewing opportunities of the dune field and lakes.
The largest exotics problem occurs in the campground which was privately held until 1998. The previous owners landscaped with a variety of non-native species. Our trip will commence with a tour of the campground. Our next biggest challenge is torpedo grass, and there are two areas in particular that are of greatest concern. We will visit these sites and discuss management challenges. We will also visit two areas where tallow and cogon grass are present but not in large numbers or areas. This will give participants a good overview of the park, its communities, and our ongoing exotic plant control program.

In addition, the FLEPPC Control & Evaluation Committee will provide a 45-minute demonstration on backpack and spot treatment calibration. Attendees will learn straightforward field methods to rapidly determine the effective per acre rate when doing spot and broadcast treatments in natural areas. This important but often neglected step is critical to ensure the labeled maximum rate per acre is not exceeded. The trip should last 2 to 3 hours depending on discussions.

Ponce de Leon Springs State Park
driving time: 50 minutes

Perhaps the “fountain of youth” associated with Ponce de Leon is the springs found in this 443-acre park located in Holmes and Walton counties. The main spring in the park produces more than 14 million gallons of water daily with a constant temperature of 68 degrees. The park property was acquired in 1970 but has been used for social gatherings of all sorts since the mid-1920s. The terrain is mostly upland pine, mixed hardwoods, flood plain forest, and swamp which follow the basic patterns of Sandy Creek, Mill Creek and Blue Creek.

The property has several exotic invasive plants such as Japanese climbing fern, Chinese tallow, Chinese privet, kudzu, cogon grass and crotalaria. The field trip will discuss different methods used to treat these species, effects of treatments, and efforts to refine the accuracy and delineation of natural plant communities.

Tyndall Air Force Base
driving time: 20 minutes

Tyndall Air Force Base is a 30,000 acre peninsula just south of Panama City. Tyndall AFB has 18 miles of undeveloped gulf beach barrier islands and hundreds of miles of shoreline along numerous bays and bayous. Native Florida habitats include mesic slash pine flatwoods, scrub, hardwood and maritime hammocks, longleaf pine restoration forests and abundant wetlands. The primary mission at Tyndall AFB is to train and operate F-22 fighter jets. However, the Air Force is a good steward of the land and their Natural Resources Branch conducts restoration of native habitats and protection for 50 threatened and endangered plants and animals, such as gopher tortoise, sea turtles, and shorebirds.

Invasive species are found on the installation, and an active identification and control program is in place. Exotic plants include cogon grass, Japanese climbing fern, air potato, Chinese tallow, mimosa, camphor, and Chinaberry trees. The field trip will visit several infested areas, particularly those with military mission impacts and highlight treatment programs and partnerships to combat exotics.
Those of us who care deeply about native plants, animals and habitats understand how important they are to our sense of place. But even as we are working to protect our natural heritage from land development and other pressures, that heritage is facing a less obvious but equally dark threat from the phantom menace of invasive species.

Invasive species endanger the survival of native plants and animals, interfere with ecosystem functions, impact the U.S. economy to the tune of 135 billion dollars each year and are a significant threat to almost half of the native species currently listed as federally endangered.

In a galaxy far, far away (called Texas), we fight back with a multi-pronged approach that combines advocacy, public outreach, research, monitoring, and the appropriate control of invasive species. The Invaders of Texas Citizen Science program, the Texas Invasive Plant and Pest Council and TexasInvasives.org reaches 150,000 Texans each year through workshops, conferences and website visitation. These Texas-sized programs work together to increase the availability and accessibility of information on invasive species and simplify reporting, motivate the public to take steps to minimize the introduction and spread of invasive species, offer volunteer programs to support federal and state pest detection and surveillance activities, and expand the use of learning and training vehicles to increase knowledge of pest identification.

Meetings like this one offer a new hope that someday there will be an alliance between federal efforts like NISC and ISAC, regional efforts like SE-EPPC, MIPN and EDDMapS, state efforts like Texas and the other EPPCs and IPCs, all the way down to the local level of CWMAs, CISMAs and PRISMs. Such an alliance could facilitate strategic planning at the local, state and regional level to ensure that on-the-ground projects fit a larger landscape-level strategy, be backed by a national mapping system that identifies outlier and leading edge populations, and create consensus on a universal assessment system that documents and helps regulate the impact of invasive species. Ideally, resources would flow through the alliance from the federation to the local level to help the EPPCs strike back.

Dr. Damon Waitt is the founding and past president of the Texas Invasive Plant and Pest Council (TIPPC). He holds a Ph.D. in Botany from the University of Texas in Austin where he studied the evolutionary ecology and population genetics of Phlox. He is Senior Director and Botanist at the Ladybird Johnson Wildflower Center, former chair of the National Association of Exotic Pest Plant Councils and serves on the Invasive Species Advisory Council (ISAC) of the National Invasive Species Council.

Dr. Damon Waitt, Lady Bird Johnson Wildflower Center at the University of Texas at Austin, 4801 La Crosse Ave., Austin, Texas 78739-1702, (512) 232-0110, dwaitt@wildflower.org
ABSTRACTS: ORAL PRESENTATIONS

PAULA BENSOFF, CHAIR
JEAN HUFFMAN
SUNCOAST CISMA
SARASOTA, FL 34240
941-322-1008 | MYAKKA12@HOTMAIL.COM

IS WEST INDIAN MARSH GRASS (Hymenachne amplexicaulis) POISED TO TAKE OVER FRESHWATER WETLANDS OF THE SOUTHEAST?

West Indian Marsh Grass (Hymenachne amplexicaulis) (WIMG) is a highly invasive wetland grass that displaces native vegetation and forms monotypic stands that alter wetlands structure and function. WIMG, native to the West Indies and Central and South America, was brought to northern Australia as a forage grass in the 1970s. Now this landscape-altering grass has spread across large parts of Australia and is classified a Weed of National Significance, with fines of up to $44,000 for failure to attempt to control it. Despite serious attempts to control WIMG in Australia it is still spreading at an average rate of 700 ha annually. WIMG was introduced into Florida in 1977. It has already invaded a large part of peninsular Florida and is spreading into North Florida. However, landowners and natural areas managers seldom identify it or distinguish it from native grasses and there are currently no national, state, or local initiatives for its eradication. At Myakka River State Park in southwest Florida the story of the establishment and spread of WIMG illustrates aspects of its natural history and control challenges.

MILLIE BURRELL, RESEARCH SCIENTIST
ALLEN PEPPER, PATRICIA KLEIN
TEXAS A&M UNIVERSITY
INSTITUTE FOR PLANT GENOMICS AND BIOTECHNOLOGY, DEPT. OF HORTICULTURAL SCIENCES
COLLEGE STATION, TX 77843-2123
979-862-4802 | MILLIEB@TAMU.EDU

MOLECULAR CHARACTERIZATION OF THE NOXIOUS INTRODUCED WEED SPECIES, Imperata cylindrica (L.) BEAUV. (COGONGRASS), USING HIGH-THROUGHPUT SEQUENCING TECHNOLOGY TO IDENTIFY INTERNATIONAL REGIONS FOR HOST-SPECIFIC BIOLOGICAL CONTROL EXPLORATION AND DEVELOPMENT

Imperata cylindrica (cogongrass), a noxious weed in at least 73 countries, has invaded over 1.5 million acres in the southern United States. Current control measures of herbicide application and tillage are too costly for the largely economically-depressed, rural southern U.S. Moreover, these control measures do not adequately control cogongrass, which demonstrates extraordinary adaptability to a range of soil types, rainfall regimes, and temperature conditions. Furthermore, cogongrass has been identified as an alternate host for Rice Yellow Mottle Virus and for Imperata Yellow Mottle Virus, a maize pathogen, and thus constitutes a significant threat to domestic and global food security. Cogongrass is a compelling example of a species for which biological controls should be developed. The overarching objective of this project is to produce a population-genetic profile with sufficient resolution to correlate U.S. cogongrass genotypes to genotypes from the native range(s) in order to identify and genetically characterize potential host-specific biological controls for this noxious pest plant species. Cogongrass samples were acquired through collaboration with state forestry commissions, whose forestry professionals surveyed, collected and provided GIS data for over 500 accessions of cogongrass from affected counties across the southeastern U.S. DNA was extracted from field-collected samples for Digital Genotyping (DG), a reduced representation genotyping-by-sequencing technology developed for C4 grasses using the Illumina short-read sequencing platform. DNAs were digested by a methylation-sensitive enzyme, individually bar-coded and multiplexed for high-throughput DG analysis. Imperata cylindrica lacks a fully
sequenced reference genome. Therefore, we employed the *Sorghum bicolor* genome as a proxy reference genome to facilitate single nucleotide polymorphism (SNP) identification. Through comparative genomics, we have produced a high-resolution phylogeny in addition to conducting Bayesian population structure analysis with 2383 informative, sequence-based SNP markers, conserved across the sorghum genome. Our data indicate the presence of three different populations within the southeastern U.S. and that each ecotype is largely clonal with minimal levels of admixture both within and among the populations. Using the same sequencing technology, we have matched genotypes from international populations to U.S. genotypes, enabling identification of ranges in which to explore for potential host-specific biological controls.

**BILLIONS AND BILLIONS OF DEAD WEEDS—FLORIDA’S UPLAND INVASIVE EXOTIC PLANT MANAGEMENT PROGRAM**

Approximately 10 million acres are set aside as public conservation land in Florida. An estimated 1.5 million acres are infested with invasive plants. To address this serious and widespread problem, the Upland Invasive Exotic Plant Management Program was implemented in 1997 by the Invasive Plant Management Section with the assistance of over 500 local, state, and federal public conservation land managers, non-governmental organizations, and private citizens. These cooperators, organized into eleven regional working groups, provide direction for the annual funding of upland weed control projects that address all Florida Exotic Pest Plant Council Category I and II species. The program incorporates the concept of placed-based management, which allows for regionally diverse interests and concerns to implement flexible, innovative strategies, while maintaining statewide consistency and accountability. To date, the “Uplands Program” has expended $110 million of state funds, matched with $40 million in cooperator cost-share, to conduct control operations on 1.8 million acres of invasive plants on 600 public conservation areas.

**EFFECTS OF DEFOILATION ON GROWTH AND REPRODUCTION OF BRAZILIAN PEPPERTREE (*Schinus terebinthifolius*)**

The exotic Brazilian peppertree is a serious invader of both disturbed and natural areas in central and south Florida, forming fast-growing, impenetrable thickets that dominate entire ecosystems. Brazilian peppertree has been targeted for biocontrol, and several defoliating insect species may eventually be released. This study was done to consider the possible effectiveness of defoliating biocontrol agents. The research investigated the effects of different frequencies of defoliation on height, crown diameter, and berry production of young Brazilian peppertrees. All the foliage was manually clipped from 36 trees in field plots once or twice per year for ≥ 1 yr. The effect on berry production of clipping 100 of the leaves from scattered individual branches of one large Brazilian peppertree was also examined. Trees that were completely defoliated five times at 6-mo intervals were significantly smaller and produced significantly fewer fruits than undamaged controls. Plants defoliated one time only, two times in 1 yr, and two times in each of 2 yr were comparable to the undamaged controls. From this simulated herbivory study, we infer that multiple defoliations by insect defoliators have the potential to significantly suppress the growth and fruit production of Brazilian peppertree in Florida.
DETECTION OF BIOTIC RESISTANCE TO *Mikania micrantha* IN FLORIDA

Studies were conducted to gain insight into the potential of *Mikania micrantha* to become a serious invasive plant in Florida. We examined biotic resistance to *M. micrantha* invasion. Biotic resistance can be defined as the ability of resident species in a community to reduce the success of exotic invasions. The specific objectives of this project were: 1) to determine the diversity of insect herbivores and plant pathogens associated with exotic and native *Mikania* spp. and 2) to determine the seasonal dynamics of *Mikania* spp. and their natural enemies in south Florida. We found a large diversity of arthropod herbivores and diseases using the native *Mikania scandens* but not the exotic *M. micrantha*. There were differences in the impact of natural enemies on *M. micrantha* and *M. scandens*. Damage scores by arthropods were low on *M. micrantha* (<40% of foliage) during the sampling period. Mite damage was higher on *M. micrantha* than on *M. scandens*. Stem galls were only observed on *M. scandens* while aphid damage was more common on *M. micrantha*. Damage by foliar diseases did not decrease during the winter months and in general was higher than the damage by arthropods. This study demonstrated that *M. micrantha* is a host not only to native insects but also to pests of agricultural and ornamental crops. We did not identify any monophagous herbivores on *M. micrantha*, but did find specialists feeding on the native *Mikania* spp. Results of this study revealed that *M. micrantha* is under a relatively low level of biotic pressure in Florida.

USE OF PRESCRIBED FIRE, GLYPHOSATE AND SEEDING IN COGONGRASS-INFESTED LONGLEAF PINE STANDS: IMPACTS ON COGONGRASS, SPECIES RICHNESS AND SPECIES DIVERSITY

Cogongrass (*Imperata cylindrica*) is a warm-season, rhizomatous grass native to southeast Asia that has invaded thousands of hectares in the southeastern United States. Its negative impacts on pine forests have been well documented and aggressive control is widely recommended. While repeated herbicide treatments are effective for suppression, integrated strategies of prescribed burning coupled with herbicide treatment and revegetation are lacking in pine systems. In particular, longleaf pine forests, which are typically open, fire dependent communities, are highly susceptible to cogongrass, which is a pyrogenic species. To better address management goals for cogongrass control and herbaceous restoration in longleaf pine forests, field studies were conducted in southwestern Alabama from 2010 to 2012. Two longleaf pine forests with near monotypic stands of cogongrass in the understory were selected for study. Treatments included combinations of winter prescribed fire, spring and fall glyphosate herbicide treatments, and seeding a mix of native, herbaceous species. Data was collected for three growing seasons following study initiation and included seasonal herbaceous species cover and final cogongrass shoot and rhizome biomass. Species richness and diversity were calculated and analyzed to ascertain treatment effects over the duration of the study. Burning slightly improved cogongrass control with glyphosate but had no effect on total cover, species richness, or species diversity. Glyphosate treatment reduced total vegetative cover and nearly eliminated cogongrass cover, shoot, and rhizome biomass. Glyphosate and glyphosate plus seeding also increased herbaceous species richness and diversity. However, above ground productivity in treated plots was significantly lower than productivity in the untreated control which was almost exclusively cogongrass. These studies
indicate that glyphosate and integrated strategies utilizing glyphosate and seeding are very useful for cogongrass management and increasing herbaceous species richness and diversity in longleaf pine.

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EXPERIMENTAL EVIDENCE FOR INDIRECT FACILITATION AMONG INVASIVE PLANTS

Facilitation among species may promote non-native species invasions, but the role of non-trophic indirect facilitation in invasions is largely unknown. Here, we used a long-term field experiment to test for indirect facilitation by invasions of *Microstegium vimineum* (stiltgrass) on a secondary invasion of *Alliaria petiolata* (garlic mustard). *Alliaria* more readily colonized control plots without *Microstegium* but produced over seven times more biomass and nearly five times more fruit per plant in *Microstegium*-invaded plots. Improved performance of *Alliaria* in *Microstegium*-invaded plots compared to control plots overwhelmed differences in total number of plants such that, on average, invaded plots contained 316 greater total *Alliaria* biomass and 214 more total fruits compared to control plots. We attribute the greater performance of *Alliaria* in *Microstegium*-invaded plots to the reduced biomass of resident species caused by the initial invasion of *Microstegium*. Furthermore, differences in the phenologies of *Microstegium* and *Alliaria* enabled them to avoid direct competition for available resources. Thus, *Microstegium* suppressed shared competitors and increased resource availability, indirectly facilitating *Alliaria*. Such positive interactions among species with similar habitat requirements, but offset phenologies, may exacerbate invasions and their impacts on native ecosystems.

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ADDRESSING A GROWING RISK: MINIMIZING THE POTENTIAL FOR BIOENERGY FEEDSTOCKS TO BECOME INVASIVE BIOFUEL/INVASIVES

The recent rapid expansion of biofuels and bioenergy production, fueled in part by federal incentives, has generated considerable interest in the use of novel, non-native and genetically modified biomass feedstocks that have the potential to become high yielding sources of biomass. However, widespread cultivation of exotic species could pose significant risks to native ecosystems and possibly even to commercial agriculture. Magnifying this risk is the fact that some of the very characteristics that make a plant ideal as a source of biomass (high above-ground biomass production, tolerance, and competitiveness, to name a few) are the very same characteristics that make a plant potentially highly invasive. Examples of potentially invasive plants that are currently being cultivated as bioenergy feedstocks in test plots and/or commercial-scale plots in the southeastern United States include giant reed (*Arundo donax*), napier grass (*Pennisetum purpureum*), and seeded giant miscanthus (*Miscanthus x giganteus*). Should these bioenergy feedstocks escape and become established in nearby natural areas, the results could be devastating for native ecosystems. Given these risks, key safeguards are needed to prevent the spread of invasive species through bioenergy cultivation, yet currently, federal and state laws largely fall short. Relevant state and federal policy issues will be discussed, and policy recommendations that could minimize or mitigate this risk will be presented. Recommendations include prohibiting the use of known invasive species as dedicated bioenergy feedstocks, assigning liability to feedstock producers for damages, and promoting the use of ecologically beneficial biomass feedstocks such as native.
plants, sustainably collected forest residues, and utilization of existing invasives through ecosystem restoration. Rigorous screening protocols and use of the precautionary principle should be integrated as a key component of future efforts to expand bioenergy.

**MONITORING PRIVATE CONTRACTORS ON PUBLIC LAND**

An estimated 1.5 million acres of Florida conservation land are infested with invasive plants. To address this serious and widespread problem, the Upland Invasive Exotic Plant Management Program was implemented in 1997. Since the beginning, the “Uplands Program” has primarily used private contractors to conduct plant control operations. The use of contractors can be a cost-effective tool, especially with the reduced staff and funding afforded most resource management agencies these days. However, optimizing, planning and overseeing private contracts can be overwhelming—not only because of bureaucratic “red tape”, but also due to the necessary on-the-ground monitoring of private work crews. The use of GIS/GPS technology can increase efficiency and manageability and reduce workload. GPS units containing treatment area boundaries can help to eliminate confusion in the field. Downloaded GPS tracks display contractor progress and indicate locations to monitor contractor efficacy. This process not only helps the site manager ensure contractor effectiveness, but also aids contractors to determine if field operations are systematic and complete.

**TAKING THE LOWCOUNTRY BACK – THE STORY OF OAK GROVE AND CHINESE TALLOW: USING STORY IN MINI-DOCUMENTARY TO EDUCATE STAKEHOLDERS ABOUT INVASIVE PLANTS**

In this project, we wanted to address one of the more pervasive problems we saw with respect to invasive species, namely public and landowner ignorance. In South Carolina’s Lowcountry, as with many other low lying areas of the Southeastern United states, Chinese tallow (*Triadica sebifera*) is an example of a pernicious yet beautiful invasive. While on the one hand, federal, state and local agencies are spending millions to eradicate the species, this very plant is on sale at multiple outlets in the state including one of the major hardware retail outlets. In this mini-documentary, *Taking the Lowcountry Back – the Story of Oak Grove Plantation and Chinese Tallow*, we chose to use story rather than a conventional educational-style approach. Once funded for this project, we quickly identified Oak Grove Plantation in Beaufort County as a “poster child” site because it was badly infested with tallow, the landowner understood the importance of this infestation on his property, and there was a high likelihood that he would receive some cost share funding for an eradication project with the Natural Resources Conservation Service. Any good story will have a number of attributes, a protagonist, a goal, a villain, jeopardy and finally a resolution. In Oak Grove, we found the classic story with the landowner (Chris Campbell) as the protagonist, Chinese tallow the villain, the goal being to restore the estate to the maritime forest it once was and the jeopardy being the inexorable growth of tallow. Resolution begins to take shape in the form of Billy McCord, a biologist who demonstrates the simple hack and squirt method to Chris; they treat about 20 trees and resolve to return in the spring. The next scene (six months later) it is quite apparent that the hack and squirt method has worked on the trees. Resolution plays out in Chris’ looking forward to the upcoming eradication project and talking about a
big picture idea of leaving the estate a better place for the next generation. The beauty of this format is that facts about the Chinese tallow, its history, life cycle and eradication, can be “hung” on the narrative arc; this can be done deliberately by the producer, but is often inadvertent. Based on our previous mini-documentary productions on soils the documentary will appeal to landowners, conservationists, and to a broader audience, especially educators and their students. The video can be found at: https://vimeo.com/59610808

FIFTY YEARS AFTER THE OLD WORLD CLIMBING FERN INVASION

By the time management efforts against Old World climbing fern (OWCF) began, there were already thousands of acres of dense infestations, cryptic, burgeoning populations, and little knowledge to apply toward management. State and federal agencies, along with industry, began research, including herbicide testing in 1991 and large-scale herbicide applications in 1999. Now, in 2013, fifty-three years since it was first found in the wild and twenty-two years after management efforts began, research and practice have provided useful information about biology and management of this insidious weed in our natural areas. However, a long-term sustainable integrated management plan remains to be fully developed.

UPDATE FROM THE IFAS ASSESSMENT OF NON-NATIVE PLANTS IN FLORIDA’S NATURAL AREAS

Detrimental effects of non-native invasive plants, including reduced biodiversity, ecosystem function, and alteration of fire regimes, are especially evident in the natural areas of Florida. Detection, monitoring, and management of invasions cost the state millions of dollars per year. Thus, preventing high-risk species from being released into natural areas and managing invasive species early in the invasion process can reduce ecological and economic impacts. To identify species most likely to invade and cause damage in Florida’s natural areas, The IFAS Assessment of Non-Native Plants in Florida’s Natural Areas (hereafter IFAS Assessment) was created by the University of Florida’s Institute of Food and Agricultural Sciences (IFAS). The purpose of the IFAS Assessment was to provide UF faculty and staff a common basis for descriptions of non-native plant species in Florida and recommendations for their use and management. The IFAS Assessment is composed of three components: the Status Assessment to evaluate resident species already present in the state of Florida, the Predictive Tool to evaluate species new to the state or proposed for a new purpose (e.g., biofuels), and the Infraspecific Taxon Protocol (ITP) to evaluate cultivars, varieties, and subspecies independently from resident species. To date, over 770 species have been evaluated with at least one of the IFAS Assessment components. Over the last two years 9 new species were assessed after detection in natural areas and status reassessments resulted in the amendment of conclusions for 104 species. Additionally, the Department of Agriculture and Consumer Services (DACS) uses the Assessment for evaluation of potential bioenergy crops as a part of their biomass-planting rule. There were 17 species evaluated as potential bioenergy crops using the Predictive Tool including Eucalyptus species, Crotalaria juncea, and Energycane L 79-1002 Sugarcane. Of these, 6 passed the assessment, 5 require further evaluation, and 6 were predicted to be invasive. The Infraspecific Taxon Protocol has been used to assess 4 Lantana and 4 Ruellia cultivars that were developed as an alternative to
problematic resident species. All *Lantana* and 3 of the *Ruellia* cultivars passed the assessment. The success of the IFAS Assessment is largely dependent on information that is queried from the land management and scientific communities who are willing to donate their time to assist in the evaluation process. In return, we hope that the synthesis of our efforts can benefit the natural areas of Florida and assist in prioritization of management efforts.

**EFFECTS OF CLIMATE CHANGE ON FLORIDA PLANT COMMUNITIES – ET TU, INVASIVE SPECIES?**

As sea levels rise, there are two likely sources of change in vegetation, particularly in coastal areas: beach erosion and salt water intrusion. In addition, climate scientists predict that hurricanes will be stronger as the climate changes. This presentation shares observations of beach erosion after Hurricane Sandy swept the SE coast of Florida, including exposed invasive plants used in private landscapes along the dunes. Along the Florida Gulf Coast, salt marsh vegetation has begun to move inland in the Big Bend area and the lower Keys, providing a peek into what the future may hold as sea levels continue to rise. As flora and fauna respond to environmental changes, there are stresses that can impair their ability to adapt. Working groups in FWC’s 2007 *Wildlife: On the Front Line of Climate Change Summit* identified invasive plants as a stressor that can impede adaptations to climatic changes and rising sea levels. Efforts to reduce invasive species populations, especially in coastal plant communities, will help to lay the foundation for more resilient coastlines.

**USE OF PRESCRIBED FIRE, GLYPHOSATE AND SEEDING IN COGONGRASS-INFESTED LONGLEAF PINE STANDS: IMPACTS ON SPECIES RELATIVE DOMINANCE**

Cogongrass is a serious threat to southeastern pine ecosystems. While numerous control studies have been conducted, information is still lacking for cogongrass management and native species restoration in longleaf pine. With longleaf pine, many land managers want to recreate mixed pine/open savannah conditions with a species rich herbaceous understory. However, cogongrass is a significant obstacle to that goal as it forms near monotypic stands beneath longleaf pine that are of little value. To address this problem, we tested multiple integrated methods including prescribed burning, glyphosate treatment, and seeding native herbaceous species. Glyphosate treatment following prescribed burning provided a minor but significant increase in cogongrass control compared to unburned, glyphosate treated plots. However, the effect was short-lived and not useful when follow-up glyphosate treatments were applied. Burning and seeding without glyphosate treatment was ineffective as cogongrass quickly recovered. Glyphosate treatment combined with seeding native species generally increased species richness, diversity and the relative dominance of native species compared to glyphosate treatment alone but did not influence cogongrass cover. It is not surprising that seeding native species had no effect on cogongrass cover as many perennial herbaceous species are slow to establish and their competitive ability may not be fully realized in the first few years. Relative dominance of seeded species reached approximately 40 on one study site, but less than 20 on the other site. The contribution of natural native recruitment was significant in the glyphosate and glyphosate plus seeding treatments, with
relative dominance of all native species ranging from approximately 75 to 90, respectively. The increase in native species relative dominance was driven primarily by forbs, with very little increase in grass dominance. Natural native recruitment included several common legumes of longleaf ecosystems. However, the majority of natural native recruitment was composed of ruderal species. This may serve as a double edge sword to restoration efforts involving seeding since competition from other natives may deter seeded species success. Recruitment of non-native species was generally low following cogongrass treatment, but did occur. Japanese climbing fern (*Lygodium japonicum*) might have become a problem but nascent infestations were treated with glyphosate during cogongrass re-treatments.

**POTENTIAL EUCALYPTUS INVASIVENESS IN FLORIDA’S NATIVE AND MODIFIED PLANT COMMUNITIES**

As fast growing crops are being evaluated for an emerging bioenergy market in the southeastern U.S., it has become a priority to understand the environmental issues associated with large-scale exotic bioenergy plantings. In particular, the potential for invasiveness has emerged as a critically important issue. Potential invasiveness is a concern for *Eucalyptus* because some species are considered invasive in various regions where they have been introduced. To assess the potential invasiveness of *Eucalyptus* being planted for mulch wood or potential bioenergy crops, field surveys of *Eucalyptus* seedling recruitment were conducted in north and central Florida locations within seed bearing *E. amplifolia* stands and in the proximate plant communities where seed dispersal may occur. Plant communities included non-grazed pasture, intensively site-prepared forestland, abandoned forest road and upland mixed pine hardwood forest. No *Eucalyptus* seedlings were found in any of the 310 1-m² survey plots across the two locations. Second, seed addition studies were conducted to determine the relative potential for seedling emergence and survival among *E. amplifolia*, *E. camaldulensis* and *E. grandis* added into plots at two seed densities, under disturbed and non-disturbed conditions, in the understory of the *Eucalyptus* stands and in each of the aforementioned proximate plant communities. Overall, emergence of added seed was very low (0.0 to 0.32%) and no seedlings survived more than 13 weeks. However, seedling persistence was greater for *E. camaldulensis* seedlings compared to the other species and greater emergence occurred under disturbed conditions and within *Eucalyptus* communities. These data indicate that under specific favorable conditions, *Eucalyptus* seedlings may establish within or proximate to planted stands, but the overall level of invasiveness demonstrated by *E. amplifolia* and *E. grandis* is not overwhelming for north or central Florida. The demonstrated role of disturbance in facilitating *Eucalyptus* seedling recruitment suggests that a stable perennial plant community (grasses) should be established instead of bare soil buffer zones to mitigate spread.

**COGONGRASS INVASION IN FLORIDA: WHAT DOES GENETIC DATA REVEAL ABOUT POPULATION VARIATION AND HYBRIDIZATION**

As one of the most recognizable and costly invasive plants in the Southeast, cogongrass (*Imperata cylindrica*) continues its spread across the region and into new, undesired areas. Cogongrass can be found in almost every county in Florida, with the Sunshine State boasting some of the heaviest known infestations. The distribution of another species within the genus *Imperata* is
also reported in Florida: Brazilian satintail (*Imperata brasiliensis*). Interspecific hybridization between these species has been invoked, where hybridization is thought to have contributed towards successful cogongrass invasion in Florida, and elsewhere. The two species share morphology and ecology, with a single, ephemeral, floral character taxonomically differentiating them. This research utilized an established genetic methodology to examine populations of *Imperata* in Florida, and determine if molecular data support two different species and/or interspecific hybridization having occurred at some point in the past. Population sampling in Florida consisted of individual tillers of invasive cogongrass populations (n=66) from throughout the state and Brazilian satintail (n=63) from isolated, non-expanding populations in Miami-Dade County. Genetic analysis utilized amplified fragment length polymorphism (AFLP) markers (N=129). An analysis of molecular variance (AMOVA) partitioned the majority of detected genetic variation within populations (86%), while only 8% of the variation was partitioned between the two putative species. The observed genetic pattern does not strongly support the presence of two distinct species of *Imperata* in Florida. Furthermore, although population structure was significant, observed patterns of population structure did not support hybridization. Analysis also suggests populations in Florida share genetic material and similar patterns of diversity as has been observed among cogongrass populations sampled across the southeastern United States. Therefore, this research does not support two distinct species hybridizing in Florida as a contributing factor to cogongrass invasion across the region.

**CURRENT STATUS AND REVIEW OF COGONGRASS (*Imperata cylindrica*) MANAGEMENT IN FLORIDA**

Cogongrass continues to be a major problem in many areas of the southeastern U.S. While previously confined to natural areas, minelands and rights of way, this species is now a major threat to pine plantations and improved permanent pastures. Management recommendations for cogongrass have remained fairly static for several years, relying on the herbicides glyphosate and imazapyr for chemical control. Integrated strategies employing burning and disking for mechanical control, when possible, have provided an increase in the level of control with these herbicides, but rarely (<5% in this author’s estimation) has complete control, i.e. eradication, been achieved with a single treatment regime in Florida. Many researchers and entrepreneurs have tried and claimed superior and single application eradication techniques/treatments, but few, if any, have proven replicable by other researchers. These include the use of specialized adjuvants to allow for better control with less herbicide, alternative herbicides to glyphosate or imazapyr that afford selective cogongrass control within native plant communities, herbicide combinations to increase control, native plantings to ward off cogongrass invasion and several others. Studies comparing new technologies and “miracle controls” will be discussed along with current management recommendations for cogongrass.
IPC WEB SOLUTIONS – WEB-BASED TOOLS FOR INVASIVE SPECIES MANAGEMENT

IPC Web Solutions was created as a partnership between the University of Georgia and Invasive Plant Control, Inc. Initially our goal was to develop tracking programs that could be used in the field by invasive species managers. As the effort has progressed many ideas have resulted in valuable web-based tools to assist land managers in the management of invasive species and other land management issues. Four online mobile smart tools will be highlighted during this presentation. IPC Project provides innovative capabilities across the entire lifecycle of a project to help organizations effectively initiate, select, plan and deliver projects on time and within budget. As a web-based tool the user can digitize contractor or in house crews daily site sheets so they can visualize, download and print reports in real time. This tool also allows you to track chemical usage and costs on a daily basis or create maintenance tools on your handheld device to eliminate costly down time while in the field; IPC Plans takes old three ring binder documents and integrates them into your mobile device. You can also include maps and historical references, identification guides, property boundaries or any other pertinent information. This tool allows the applicator to enter control data directly into the plan on the day an infestation was treated. Instead of compiling notes throughout the course of the year this tool allows you to do it at any time using your mobile device. Once submitted, the plan is automatically updated and available for all specified parties; IPC Logic is a decision support tool that, when supplied with specific information about invasive species infestations, will determine the most economical, environmentally sensitive and efficient management strategies customized for your natural area; IPC Inventory can provide species lists, time stamps, photos, maps, individual species points, area polygons, species population area or of the entire survey area, infestation density, and other valuable data. Whether running transects, gathering plot data, or taking photo points, IPC Inventory can capture all the information needed to create a detailed report all in your mobile device. This presentation will highlight some advancements in these technologies and outline how they can benefit land managers whose primary focus is invasive species. During the presentation we will offer live demonstrations of these tools currently being used by not-for-profit land managers, counties, states and federal agencies.

THE CENTRAL FLORIDA LYgodium STRATEGY: HOW SUCCESSFUL ARE WE AT STOPPING THE NORTHERN SPREAD OF OLD WORLD CLIMBING FERN?

The Central Florida Lygodium Strategy (CFLS) is a partnership including The Nature Conservancy (TNC) and other land management conservation groups, federal, state and local governmental agencies, and private landowners. The CFLS was formed to develop and implement a cooperative, comprehensive program of survey, control, and monitoring of climbing fern infestations on public and private lands in central Florida to effectively prevent further northward movement of Lygodium microphyllum or Old World climbing fern (OWCF). Through a coordinated approach involving both public and private land owners and managers, CFLS strives to create a kind of “firebreak” across central Florida – a zone of early detection and rapid response aiming for eradication of OWCF along its northern line of migration. To this end, mapping and assessment, treatment and follow-up of the northern infestations of
OWCF continue to be objectives which require a coordinated, multi-agency, regional approach to be effective. In addition, partners have been monitoring sentinel sites along the northern line to measure success in stopping northward spread. Through CFLS and a private lands initiative, TNC staff and contractors now have surveyed over 15,000 acres and worked 3,320 acres on 40 private properties adjacent to public conservation lands in the northern zone with funding provided by federal and state partners. During 2013, two infestations far north of the northern line (in Duval County) were identified and treated by partners in the First Coast Invasive Working Group. Does this mean this approach has failed, because infestations were found far north of the northern line, or does it mean it has succeeded, because those infestations were quickly detected and treated? Come hear the talk and join the conversation (and become part of the EDRR team).

**WHY WE THINK EPPCS SHOULD INCLUDE INVASIVE EXOTIC ANIMALS IN THEIR MISSION**

In the spring of 2012, the Florida Exotic Pest Plant Council and the Florida Chapter of The Wildlife Society held a joint conference with an Invasive Wildlife session that was well-attended and brought energy to both groups. There have been other joint conferences in the past where the two groups did not mix as well (e.g., FLEPPC and Florida Native Plant Society) and seemed to run along parallel tracks, but this collaboration seemed natural and provided a place for invasive animal information to be shared among people working statewide. This makes sense since those working to treat exotic plants encounter exotic animals and vice versa. During and following the joint conference, some members talked about adding invasive exotic animals to the FLEPPC mission. A survey of members that included that question found that membership was 50/50 for and against. The matter has been tabled for now. We suggest it be reconsidered and, furthermore, we suggest it be considered a joint project of FLEPPC and FL TWS. We will explain why we think adding a focus on invasive exotic animals will benefit both groups and not detract from their other good work but will enhance it. We will address some of the concerns we have heard and hope to continue the discussion that began at last year’s conference. This proposal pertains to Florida but is bigger than Florida. We will also address why we think all EPPCs should consider adding exotic animal talks, concerns and members who may not otherwise participate in EPPCs.

**GEORGIA’S COGONGRASS PROGRAM: AN EARLY DETECTION RAPID RESPONSE SUCCESS**

Georgia’s state-wide cogongrass detection and eradication program showcases the effectiveness of an Early Detection Rapid Response (EDRR) program focused on a single invasive plant. In 2004, a diverse group of government and private agencies and other stakeholders came together to form the Georgia Cogongrass Task Force. Lead by the Georgia Forestry Commission (GFC), with funding from the U.S. Forest Service, direct control actions were taken on known spots/infestations and a comprehensive state-wide education program focused on forest and agricultural landowners, natural resource and right-of-way managers, hunters and the general public on the ID and reporting of cogongrass spots to local GFC and University Extension offices. Following up a report, GFC personnel inspect the site and if cogongrass is found, a herbicide eradication program will be initiated at no expense to the landowner. Treatments continue until cogongrass is eradicated from the site. The GFC
recognizes a spot as eradicated after three consecutive years of finding no cogongrass resprouts. Since the program began in 2004, a total of 693 sites totaling 182.5 acres as of January 7, 2013, have been reported in 52 counties across the state. Most sites are small averaging 1/10 of an acre with very few exceeding several acres. Presently, 220 spots are eradicated, 137 spots have been negative for two years, and 131 spots have been negative for one year while the remaining 205 spots are active. Overall, approximately 70 of all known spots are now negative for cogongrass.

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INVASIVE PLANTS LISTED FOR THE THIRTEEN SOUTHEASTERN STATES

This is a January 2013 compilation of invasive plants currently listed by the Federal Noxious Weed Law and its amendments, state laws, and Exotic/Invasive Plant Councils for the 13 southeastern states. These 13 states comprise the Southern Region of the USDA Forest Service. Invasive plants are grouped by growth form, aquatic plants, and a separate “Watch List” of listed plants that are not known to occur within the Southern States or the Continental United States as recorded in the USDA Natural Resources Conservation Service’s Plants Database (http://plants.usda.gov). Images, descriptions, and maps of known occurrence of these species are available at the Plants Database and the University of Georgia’s EDDMapS (www.eddmaps.org). The objective of this compilation is to aid in the formulation of strategic programs at the regional and state levels to consider recognize invasive plants in adjoining states. This is an update to the May 2004 “Invasive Plants of the Thirteen Southern States” (http://www.invasive.org/south/seweeds.cfm ). The Federal Noxious Weed Law of 2000 (with amended lists) regulate the importation, sale, and inter-state transportation of listed species. The Law also requires all states to adopt the federal list in their individual noxious weed laws, which regulate the importation, intra-state sales, and transportation of listed species. Currently, 10 states within the region have noxious weed laws, while only 5 states have adopted plant species on the federal list. Those states that include federal listed plants are Alabama, Georgia, North Carolina, South Carolina, and Florida. Louisiana, Kentucky, and Virginia do not have noxious weed laws. The general criteria for listing are provided in the header with header links to more complete information. Exotic/Invasive Plant Councils have been formed in 10 southeastern states. These councils formulate invasive plants lists using expert opinion for their state and periodically review and update these lists. These lists have no legal authority while they are often referenced and used in formulating lists for federal agencies within a state and other non-governmental organizations. The Virginia Department of Natural Resources has formulated a list.

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2013 UPDATE ON THE FLORIDA ADVOCACY GROUP, INVASIVE PLANT MANAGEMENT ASSOCIATION (IPMA)

We all know that in easy times we stay relatively quiet, but as times get leaner we tend to speak out. Well, for those of us whose careers have been devoted to and whose livelihood depends on publicly funded vegetation management projects, that time has come. Even as the economy is healing, budgetary battles continue in Florida’s Capitol with public agency vegetation management budgets continuing to face severe scrutiny and conservation/management trust funds remaining vulnerable. Although there
has been very effective lobbying activity in Florida for supporting public
funding of aquatic plant management efforts, until this year (2013) there has
not been a concerted effort by the invasive plant management community as a
whole (both aquatic and upland). In response to the residual financial crisis in
Tallahassee and its potentially negative influence on Florida’s natural
resources and those dependent on managing natural lands and waters, the
not-for-profit 501(c)(6) advocacy organization, Invasive Plant Management
Association (IPMA), was incorporated in Summer 2012. IPMA was organized
with the intent to provide the voice of upland and aquatic invasive plant
management during the 2013 legislative session with the Mission being: “To
foster sustained State funding for invasive plant management measures as an
integral part of managing Florida’s natural lands and waters.” The Strategic
Outlook is to foster an ingrained legislative culture of sustainable state funding
for invasive plant control, exclusive of how the agencies distribute the funds
through procurement (not concerned with influencing the Agencies’ individual
contracting policies). IPMA has retained the lobbying firm Lewis, Longman,
Walker, PA. (LLW) as their advocate in Tallahassee. The first step was the
development of a 2013 Strategic Plan through IPMA’s Legislative Committee
and LLW. This plan centers around Legislator awareness regarding the
necessity and public benefits of invasive plant management in Florida, which
requires a solid public/private infrastructure dependant on sustainable public
funding. Basically, this means putting an economic face on what most
politicians see as only an environmental problem. Specific goals for the 2013
legislative session include: Increased funding for Florida Fish and Wildlife
Conservation Commission (FWC) by seeking support for FWC’s increased
2013/14 budget request and by seeking support for keeping (or even
increasing) the FWC Invasive Plant Management Trust Fund; Initiating
discussions for setting a dedicated funding source for invasive plant
management on other state lands, in lieu of FWC Trust money; and, To
investigate opportunities for other sources of public funding for invasive plant
management.

APALACHICOLA REGIONAL STEWARDSHIP ALLIANCE–CISMA: BENEFITS
OF PUBLIC-PRIVATE COOPERATIVE WEED MANAGEMENT

Apalachicola Regional Stewardship Alliance (ARSA) began nearly a decade ago
as an informal, semi-annual roundtable discussion over buffet lunch and
coffee. The common needs and challenges of managing roughly 1,000,000
acres of conservation land throughout the Apalachicola River watershed has
since resulted in several Memoranda of Understanding between partner
members and, in 2012 alone, over 116,000 acres of “cooperative
management.” ARSA Cooperative Invasive Species Management Area (CISMA)
is one aspect of the alliance that draws on the close working relationships
among the state, federal and private land management partner members.
ARSA CISMA has focused efforts since 2003 on funding invasive species control
projects on private lands adjacent to natural areas. This work capitalizes on
The Nature Conservancy bearing legal responsibility for work off of public
lands, and project vetting, design and implementation directed through the
local expertise of ARSA land manager-members. Recent geographic growth
within the CISMA to include Bay County (where you sit for this conference) has
mirrored organizational development including: a formalized steering
committee, annual goal setting, volunteer and community work days and an
annually updated Early Detection/Rapid Response species list. ARSA, and the
CISMA steering committee, are optimistic that these formalized, cooperative relationships across properties, political boundaries and management bureaus will result in new sources of funding and will continue to bring down the cost of land management through the sharing of staff, equipment, resources and ideas.

SEVEN YEARS OF COOPERATION ON EVERGLADES INVASIVE SPECIES MANAGEMENT, THE ECISMA EXPERIENCE

The Everglades Cooperative Invasive Species Management Area (ECISMA) is a formal partnership of federal, state, tribes, local governments, non-government organizations and private individuals that was established in 2006 through a Memorandum of Understanding. ECISMA since its inception has strived to improve the effectiveness of invasive species management in the Everglades. Through cooperative efforts ECISMA has established an effective framework for inter-agency management initiatives including early detection/rapid response, monitoring, outreach and control. This framework has greatly enhanced regional invasive plant management and has fostered much needed integration of invasive animal management.

LAKEVILLE FROM FLORIDA TO GEORGIA

Lakeville provides classroom ready curriculum to teach students about invasive species and ecosystem functioning in a fun and engaging way. It is a multi-disciplinary unit about ecosystems, natural resource management (i.e., invasive species), sustainability and civic responsibility. The activities can be presented in sequence for flow and reinforcement of subject matter or as stand-alone sessions. Each session is designed to encourage critical thinking while enhancing students’ environmental knowledge. Sessions 1 and 2 provide background information about native, non-native and invasive plants (if needed) and Session 3 brings it all together in a fun game-show style activity that gives students a chance to use their persuasive debate skills and make management decisions about a local freshwater habitat. The goal is to prepare students for their role as future citizens and environmental stewards.

Lakeville was written and produced by Amy Richard, Dan Kahn and Jason Evans at the University of Florida (UF)-IFAS and field tested in area classrooms for three years by Kitty Lane. It has also been demonstrated for teachers at PLANT CAMP, an annual invasive plant workshop for teachers, held each year by UF-IFAS. This summer, Lane will be demonstrating Lakeville for teachers in several school districts in Georgia, thanks to a collaborative effort by the University of Florida-IFAS, the Florida Fish and Wildlife Conservation Commission, the University of Georgia (Tifton), a SE-EPPC matching grant (to GA-EPPC) and with additional funding from the Aquatic Ecosystem Restoration Foundation and the Aquatic Plant Management Society. The workshop is being organized by Susan Reinhardt at the University of Georgia Tifton campus and it represents one of the first endeavors to cross state boundaries with invasive plant curricula for grade school students. We hope it is the first of many.
SIX RIVERS COOPERATIVE INVASIVE SPECIES MANAGEMENT AREAS (CISMA)

The core mission of all the Cooperative Invasive Species Management Areas (CISMA), is to partner across the landscape (both public and private) to address the management and treatment of invasive non-native species. The creation of the Northwest Florida CISMA occurred in October 2009 and was formed based on the successful multi-agency partnership successes of the Gulf Coastal Plain Ecosystem Partnership (GCPEP). The Nature Conservancy utilized funding received from the Department of Defense (DoD) Legacy Program to initiate the creation of the CISMA through this existing partnership. The boundaries, initially only six Florida counties, were expanded to nine counties with the inclusion of three counties in Alabama to form the Six Rivers CISMA. Consistently, representatives from twenty-five public and private agencies regularly attend CISMA meetings. Since its inception, a steering committee and six subcommittees were designated, and a five-year strategic plan was put in place. The efforts of the CISMA partners have allowed for many of the participating agencies to identify invasive species management and removal as a priority goal. This has resulted in successful awareness campaigns, outreach programs, thousands of acres treated, streamlined tracking measures, and the creation of seasonal job positions. Attendees identified a number of benefits as a result of developing a CISMA in the region, including: the ability to assess problems on a landscape scale; allowances for treatment across property boundaries; participation in invasive species treatments; cooperation in leveraging funds; assistance for private landowners in removing invasive species; reduction of the high maintenance costs incurred from invasive species re-infestations; expansion of public awareness regarding invasive species; providing agency invasive species points of contacts information; and sharing of knowledge about agencies services in managing invasive species. This initiative, now in its fourth year, is working through the strategic plan and making great strides in education, outreach and treatment across the nine county area.

WEED WAR II: AMERICORPS ATTACKS INVASIVE PLANTS IN FLORIDA STATE PARKS

AmeriCorps is a national service program created in 1994 through the joint efforts of the federal government and community groups nationwide. The Florida Park Service (FPS) began the Florida State Parks AmeriCorps program in 1996 following a competitive grant application process. Since then, more than 270,000 acres and over 8,000 miles of trails have been improved, and millions of park visitors have benefited from members’ service. For more than a decade the FPS has been fortunate to receive funding and support for our Florida State Parks AmeriCorps program. Beginning in 2012, the program focus was targeted to the critical unmet need of invasive plant management in the state park system. This created Project A.N.T. (AmeriCorps Non-native Plant Terminators). Through Project A.N.T., AmeriCorps members treated over 11,000 gross acres of invasive exotic plants. This is 62 percent of the total gross acres treated by the FPS during 2012. Additionally, AmeriCorps members reached more than 10,000 people through their interpretive programs, and recruited 1,600 new volunteers, contributing 5,966 hours to Florida state parks. In 2013, AmeriCorps Weed War II begins. With approximately $900,000 in grant funding, 47 full-time members will impact over 55 state parks from
Pensacola to Miami. By the end of the year the expectation is to treat 3,150 gross acres of Category I and II invasive exotic plant species, moving at least 788 acres into maintenance condition. Members will recruit, train and manage 1,200 new volunteers to provide 6,000 hours in invasive exotic plant management. At least 800 park visitors and community members will be educated about invasive exotic plants. Additionally, members will conduct invasive exotic plant surveys, and continue habitat restoration efforts through native plant reintroduction. Members also participate in Invasive Exotic Plant Strike Teams, gathering forces to intensify the impact through monthly group projects. Each member commits to completing 1,700 hours of service within 11 months. In addition to training and experience, members earn a monthly stipend and, upon completion of the term of service, an education award valued at around $5,000. A significant number of members go into resource or invasive plant management careers. This program provides a model for cooperative funding and accomplishment in invasive plant management. This model has the potential to be expanded through partnerships with other local, state and private entities. AmeriCorps grant funding is available from Volunteer Florida through an annual grant process each spring.

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SPATIAL INVASIVES INFESTATION AND PRIORITIZATION ANALYSIS (SIIPA) GIS MODEL

The Nature Conservancy’s Site Weed Management Plan Template includes a great tool for prioritizing the risk posed by invasive species. It ranks species based on current extent; current and potential impacts; value of habitats the species infest or could infest; and difficulty of control and establishing native replacement species. This risk assessment was created for Early Detection/Rapid Response species but can also be used for control species. The two GIS models are roughly based on this prioritization system and can be fairly easily adapted and applied to any preserve or area. The first model considers the extent and impacts of the species and produces a grid-based “General Invasion Map” giving each cell a ranking based on the number of populations, the infested acreage and species of each population. The resulting map shows the most invaded areas of a preserve based on the current available data. The “Invasive Priority Analysis” model also considers the quality of the habitat(s) where the invasive population occurs; whether successful control measures have been established for this species and the effort required to follow the measures. The known invasive populations for a preserve will be ranked by the priority score, aiding in prioritization decisions. The map produced by this model is similar in appearance to the first map. Both models have been designed to be very customizable for a variety of situations and needs. These models and their map products provide an excellent opportunity to let the data show where the biggest invasive problems are so that effective control objectives and strategies can be formulated and later evaluated; they can be used to help develop a work plan based on your weed management plan goals; they are great resources for communicating the invasives situation in reports and to stakeholders; it also easily conveys the current invasive situation to new employees, maintaining a certain level of “institutional memory.” The presentation will cover the background and products of the models, and will show how to run and edit the model.
KEYNOTE SPEAKER: THE PHANTOM MENACE

Those of us who care deeply about native plants, animals and habitats understand how important they are to our sense of place. But even as we are working to protect our natural heritage from land development and other pressures, that heritage is facing a less obvious but equally dark threat from the phantom menace of invasive species. Invasive species endanger the survival of native plants and animals, interfere with ecosystem functions, impact the U.S. economy to the tune of 135 billion dollars each year and are a significant threat to almost half of the native species currently listed as federally endangered.

In a galaxy far, far away (called Texas), we fight back with a multi-pronged approach that combines advocacy, public outreach, research, monitoring, and the appropriate control of invasive species. The Invaders of Texas Citizen Science program, the Texas Invasive Plant and Pest Council and TexasInvasives.org reaches 150,000 Texans each year through workshops, conferences and website visitation. These Texas-sized programs work together to increase the availability and accessibility of information on invasive species and simplify reporting, motivate the public to take steps to minimize the introduction and spread of invasive species, offer volunteer programs to support federal and state pest detection and surveillance activities, and expand the use of learning and training vehicles to increase knowledge of pest identification.

Meetings like this one offer a new hope that someday there will be an alliance between federal efforts like NISC and ISAC, regional efforts like SE-EPPC, MIPN and EDDMapS, state efforts like Texas and the other EPPCs and IPCs, all the way down to the local level of CWMAs, CISMAS and PRISMs. Such an alliance could facilitate strategic planning at the local, state and regional level to ensure that on-the-ground projects fit a larger landscape-level strategy, be backed by a national mapping system that identifies outlier and leading edge populations, and create consensus on a universal assessment system that documents and helps regulate the impact of invasive species. Ideally, resources would flow through the alliance from the federation to the local level to help the EPPCs strike back.

DOING THINGS DIFFERENTLY: TRACKING INVASIVE EXOTIC PLANTS IN THE FLORIDA PARK SERVICE

The Florida Park Service (FPS), a Division of the Department of Environmental Protection (FDEP), manages 171 State Parks and Trails encompassing approximately 789,000 acres. A vast majority of this acreage is conservation land being managed for resource-based recreation. Virtually all natural communities (as defined by the Florida Natural Areas Inventory or FNAI) are represented within the state park system. Additionally, 94% of Florida's rarest species and community types are represented on FPS lands. For many years, the state parks in Florida tracked invasive plant treatments using a relatively standardized methodology that included a mix of reporting acres treated and stems treated. However, the FPS could not answer the following questions: – How many acres are infested? – How many acres do we need to treat annually? – Are we making progress? – How much money is needed? In 2009, a statewide team of FPS stakeholders was assembled to determine what the survey needs were in the field in addition to the needs of Division Management as well as considering broader industry survey standards.
Numerous options were considered including privatizing the task, using existing methodologies (WIMS, FLInv, EDDMapS, iMapInvasives), or developing our own system. In the end, it was determined that developing our own system was necessary to meet the Division’s objectives while minimizing field staff-hours and administrative costs (minimal funds were appropriated with this new program). A survey system was developed and implemented in 2010 which is based on the field survey methodology of the FNAI (with some important differences). In subsequent years, a treatment form and treatment goal-setting form were added to round out the FPS requirements for tracking and managing invasive plant species. Currently, a mapping application is being developed in ArcGIS and FDEP’s Mapdirect system. Significant challenges have evolved including database speed over the Division’s network, the limitations of the database platform (Microsoft Access), training database users, providing for data security, the differing needs and desires of hundreds of users (of varying computer skills), and making the program a priority with the field staff. Although the system is perfect for no park or trail, it provides a reasonably acceptable compromise for the large variety of properties and users within the Division.

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BIOLOGICAL CONTROL OF CHINESE TALLOW; RESULTS FROM FOREIGN EXPLORATION AND HOST TESTING

Chinese tallow, *Triadica sebifera*, is among the worst environmental weeds in Florida and other areas of the southeastern U.S. This species occupies diverse habitats causing many environmental problems including decreased biodiversity of the infested areas. Although chemical controls are known and used to control this invasive species, biological control presents an attractive alternative when practiced safely. The native range of this species primarily includes central and southern China. The USDA/ARS Invasive Plant lab and colleagues at the Chinese Academy of Science have been conducting foreign surveys searching for insects that will be safe and effective at controlling Chinese tallow in the U.S. The most promising and advanced species is the flea beetle *Bikasha collaris*. The no-choice testing of adults on 73 plant species indicates that egg deposition, larval, and adult feeding occur only on the target weed and a related plant not found in the U.S. Finally, the impact of larval, adult, and a combination of both larval and adult feeding on tallow saplings indicates a significant decrease in total biomass, especially for the combined damage treatment. Another biological control species, *Gadirtha inexacta* is a defoliating moth that was discovered and tested in China. This species restricts its feeding and development to the target weed and several related species that do not occur in the U.S. Testing of this species began during summer 2012. Another insect, a new species of gall forming fly, forms stem galls on tallow. This species continues to be tested in China.
EFFECTS OF SOIL BIOTA AND RHIZOSPHERE EXTRACT FROM NON-NATIVE Lonicera maackii ON THE NATIVE Impatiens capensis

Invasive plant species, such as Lonicera maackii, are threats to the ecosystems of their invaded ranges. While many plants species are identified as being invasive, little is known about the mechanisms that allow for their success. An area of specific interest is how a non-native invasive species can interact with a native plant species. Allelopathy is a proposed mechanism by which an invasive plant might directly, or indirectly, suppress a competitor by phytochemical products. Though L. maackii has been described as having allelopathic potential, it remains unclear as to the impact that it has on below ground processes. These processes may include nutrient uptake, mycorrhizal infection, soil microbial activities and response to pathogens. In order to explore the potential below ground effects of L. maackii on a native species, Impatiens capensis, we tested the effects of a rhizosphere extract under two soil conditions and measured mycorrhizal infection, through time, with microscopy. The natural fluorescence of the mycorrhizae allowed us to observe changes in the infection of the roots resulting from treatment with L. maackii rhizosphere extract. Our results found that soil sterilization, and soil sterilization with exposure to L. maackii, affect mycorrhizal infection in I. capensis roots. In addition, we found positive effects of soil sterilization on above ground growth measures. Evaluation of our growth measures and mycorrhizal infection revealed different positive correlations between various growth measures in different treatments, but no significant correlations to mycorrhizal infection. The results of this experiment offer supporting evidence of the allelopathic potential of L. maackii, as well as the significant role of the microbial community present in field soils for plant-plant interactions and early growth performance.

ASSESSING THE IMPACTS OF COGONGRASS (Imperata cylindrica (L.) Beauv) ON ROOT-FEEDING BARK BEETLE POPULATIONS ASSOCIATED WITH SOUTHERN PINE DECLINE

The non-native, invasive grass, cogongrass (Imperata cylindrica (L.) Beauv) is an increasing threat to the diversity of native plant species of the southeastern U.S. Another issue facing landowners of southeastern forests is Southern Pine Decline (SPD). The factors associated with SPD include a complex of abiotic and biotic stressors that cause economically significant premature mortality in pine forests. A suite of root-feeding bark beetles associated with SPD could potentially have higher populations in areas containing cogongrass due to additional stresses. Twenty plots were established in a loblolly pine plantation located in southeastern Mississippi (10 with cogongrass/10 without cogongrass). Data show that Hylastes salebrosus is the most abundant species and has consistently higher populations in cogongrass plots. Hylastes porculus, Dentroctonus terebrans, and Hylobius pales show similar trends, but populations are not significantly different between treatments. Ten year annual growth was found to be significantly less in plots containing cogongrass compared to growth of trees in plots not containing cogongrass. Pine fine root weight was found to be significantly less in plots containing I. cylindrica as well. This may indicate that cogongrass is having a negative effect on loblolly pine root growth leading to reduced radial growth and increased stress.
DOES HERBICIDE TRANSLOCATION CORRELATE WITH SEASONAL CARBOHYDRATE BALANCE IN AN EVERGREEN SHRUB *Ardisia crenata*?

Invasion of exotic plants in natural areas has become a growing concern for land managers. One of the most common methods of control has been the use of herbicides. In the state of Florida, mesic hardwood hammocks are invaded by *A. crenata*, a perennial exotic plant with high capacity to resprout. It has often been controlled by mowing and foliar-application of the herbicide triclopyr (3,5,6-trichloro-2-pyridinylxoyacetic acid), however its efficacy is reported to be variable. We conducted two experiments (field and greenhouse) to test whether herbicide efficacy may be improved by selecting the optimal time of application that considers species-specific attributes including plant form, life history, and physiological characteristics. In the field experiment at Gainesville, Florida, we evaluated the efficacy of triclopyr herbicide in relation to the seasonal applications (October, January, April, and July) and the effects of mowing in relation to root carbohydrate dynamics. The second experiment in a greenhouse aimed to quantify the movement of 14C-labeled herbicide within the plant in relation to light availability and carbohydrate dynamics. In the field, adult plants showed lower herbicide efficacy in January and was not influenced by prior mowing. Efficacy on seedling abundance changed over the seasons with a significant effect of mowing, which removed seed sources. The greenhouse experiment showed that large amounts of herbicide remained on the leaf surface, but a high proportion of what entered the plant was translocated to the roots. Triclopyr is an effective herbicide to kill adult *A. crenata* provided adequate time occurs to facilitate herbicide uptake prior to a rainfall event, and removal of seed bearing shoots by mowing or other means are important for preventing rapid recovery of the population.

IMPACTS OF COGONGRASS IN SOUTH ALABAMA: MAPPING THE EXTENT AND UNDERSTANDING PERCEIVED THREATS

Cogongrass (*Imperata cylindrica*) is an invasive species that was introduced to the United States in the 1900s via seed in packing material in shipping containers from South Asia. It spreads by both underground rhizomes and windblown seed. Currently, it is distributed in southeastern U.S., particularly in the states of Alabama, Florida, Mississippi, Georgia, South Carolina, Texas, and Louisiana. Many natural resources are affected by the spread of this invasive species in Alabama. In this research project, remote sensing is utilized as well as a landowner survey instrument to map current cogongrass locations in South Alabama and assess the documented and perceived impact this invasive species has had upon the management of the land. Both a manual and automated process was evaluated for mapping the extent on open agricultural lands and right-of-ways. The manual mapping was chosen as the more accurate method currently for mapping cogongrass with an accuracy of approximately 90.5%. Approximately 10,500 acres were mapped in Mobile and Baldwin Counties and it is estimated that it would cost more than $630,000 dollars to control this much area of cogongrass. Resource managers surveyed for the study believe that there is a strong economic impact primarily in the timber industry and on livestock production. This study involves testing various methods to locate and map this invasive species. Another aspect of this study involved interviewing resource managers in Alabama and surrounding Southeastern states to gain an understanding of their perceptions of
cogongrass as an economic threat. Results of the mapping gave the areas of cogongrass infestation in the pasture and crop lands as well as right-of-ways of Mobile and Baldwin Counties. The outcomes of the survey and interviews provided an estimated cost of controlling cogongrass per acre.

LIFE HISTORY ADAPTATIONS AND DAMAGE OF *Calophya* spp. (HEMIPTERA: CALOPHYIDAE) TO BRAZILIAN PEPPERTREE

Gall forming insects are highly specialized herbivores that often complete development on a single host plant. Because of their specificity and damage to the host, gall formers have been used in several weed biological control programs. As an initial step towards understanding the suitability of leaf galling psyllids as potential biological control agents of Brazilian peppertree, we determined the densities in the native range, and the life history adaptations under quarantine conditions of *Calophya latiforceps* and *C. terebinthifolii*. In the city of Salvador, Bahia State, densities of *C. latiforceps* galls reached as high as 1250 per Brazilian peppertree leaf, and caused severe discoloration. The process of host colonization by *Calophya* spp. begins when the female inserts an egg at the border of the leaflet or along the veins. Eggs hatch 8-9 days after oviposition and the first instar or “crawler” explores the adaxial surface of the leaflet to find a place to settle. A yellow halo is noticeable around nymphs two or three days after they settle. Gall growth increases over time reaching a peak in the 4th and 5th instars. Development from egg to adult takes 44 to 50 days. Observations of the insect colonies maintained at the quarantine of the University of Florida in Fort Pierce, suggest that the *Calophya* spp. galls not only reduced the photosynthetic capacity of Brazilian peppertree, but also resulted in shedding of young leaflets.

NATIVE PLANT COMMUNITY RESPONSE TO DIFFERENT METHODS OF REMOVAL OF EXOTIC INVASIVES

Exotic plant invasions disrupt native ecosystems and reduce the richness, abundance, and health of native plant communities. Curtailing exotic plant invasions and removing them from invaded sites can be difficult and costly, yet may be critical for conservation and restoration efforts. Our study sites were established in 2008 on two forested areas on the campus of University of North Carolina, Asheville. Sampling was conducted in the understory, shrub layer and overstory before the plots were treated for exotic invasive removal either mechanically (by digging and pulling), chemically (foliar application of herbicide), or a combination of mechanical and chemical treatments. Sampling and treatments were repeated annually. All three treatments reduced exotic cover, and community responses to treatment are being investigated. Understory data from 2008-2010 was compiled and analyzed with PC-ORD using non-metric multidimensional scaling (NMMS), which revealed that the understory plant communities on the two study sites are distinct from each other. Further analysis will employ NMMS to determine if the shrub and canopy layers are also unique between the two sites. Next, the native and exotic plants of each site will be analyzed separately to determine if any clusters of species are responding similarly to particular treatments, or if any exotic invasive species are drivers of the plant community response. Identifying exotic species that have the most impact on the overall plant communities and targeting them for removal will help maximize scarce resources and get the most out of restoration projects.
CHINESE TALLOWTREE SEED BANK ECOLOGY, SEEDLING DYNAMICS AND NOVEL HERBICIDES FOR CONTROL

Chinese tallowtree (Triadica sebifera) is an aggressive non-native tree capable of invading a wide variety of habitat types. Explosive increases in local populations are occurring across the Gulf Coast, extending as far north as central Alabama. Tallowtree displaces native species, is potentially toxic to livestock and some wildlife, impacts nutrient cycling, and is having an increasing impact on production forestry. It is difficult to control due to its vigorous re-sprouting and release and/or recruitment of seedlings from an extensive seed bank. Our objectives are to evaluate integrated strategies for Chinese tallowtree control. We are comparing two new herbicides, imazamox (Clearcast) and aminocyclopyrachlor (Streamline) with the commercial standard triclopyr (Garlon 4 or 3A) and an untreated control. We are also evaluating application techniques, the role of tallowtree size in relation to treatment efficacy and the degree of non-target injury to desirable plant species. We are also evaluating advance reproduction in tallowtree stands and will also test methods to control seedling recruitment following initial control efforts, in relation to seedling emergence patterns. These data will assist developing optimal management strategies that address Chinese tallowtree control, from seedlings to mature trees.

A LiDAR EVALUATION OF 3-DIMENSIONAL PATTERNS OF THE INVASIVE OLD WORLD CLIMBING FERN

Old World climbing fern (Lygodium microphyllum) is an invasive plant listed by the Florida Exotic Pest Plant Council (FLEPPC) as a Category I invader with significant ecological and economic impacts that threaten native plant diversity. This plant relies on native vegetation for structural support to ascend into the forest canopy and forms dense vegetation mats that cover tree crowns. It proceeds to alter the 3-dimensional structure of the canopy and subsequently affects the light regime which negatively impacts native plant composition. Airborne LiDAR (Light Detection And Ranging) technology is a form of remote sensing that measures the elevation of surfaces over a site. This study aimed to determine the efficacy of using LiDAR to examine the biophysical changes induced by an invasive plant on its ecological surroundings, such as shading by the invader and changes in canopy openness and biomass, and to quantify the extent to which they alter community structure. The novel implementation of LiDAR analysis would help to reduce the amount of field surveys that land managers are required to undertake and provide a more detailed picture of how canopy structure is altered by invasive climbing vegetation.
THE DEVELOPMENT OF ArcGIS METHODOLOGY ENABLING A DIRECT COMPARISON OF Melaleuca quinquenervia SPATIAL DATA FROM SYSTEM RECONNAISSANCE FLIGHTS AND DIGITAL AERIAL SKETCH MAPPING WITHIN THE EVERGLADES COOPERATIVE INVASIVE SPECIES MANAGEMENT AREA

Melaleuca quinquenervia is an exotic invasive plant species that poses one of the most serious threats to the native biodiversity of South Florida, especially within the Everglades (Serbesoff-King 2003, Dray Jr. et al 2006, Langeland and Burks 1998, Laroche and Ferriter 1992). Once melaleuca infestation occurs, it degrades the integrity of the native flora and fauna’s habitat and rapidly colonizes the area, overtaking up to 95 percent of a one square-mile area within 25 years (Serbesoff-King 2003). Furthermore, the total economic detriment to South Florida was estimated at $2 billion by 2010, notably including tourism, recreation, and control effort costs (Balciunas and Center 1991, Serbesoff-King 2003). Hence, it is imperative to facilitate a meaningful comparison between historic and recent melaleuca spatial data in South Florida, specifically within the Everglades Cooperative Invasive Species Management Area (ECISMA). However, accomplishing this had been virtually impossible between the historic System Reconnaissance Flight (SRF) data and more recent Digital Aerial Sketch Mapping (DASM) data; they featured incompatible data collection methodologies and different data types (point, polygon). I collaborated with scientists from the Land Resource Bureau (LeRoy Rogers) and National Park Service (Tony Pernas, Jed Redwine); they provided historic SRF point data (1995), DASM polygon data (2012), and the ECISMA boundary extent (2013). Consequently, my objective was to simulate the SRF data collection methodology using ArcGIS to generate “SRF samples” of the DASM data lying within the ECISMA boundary. The outcome was a point-based dataset directly comparable to the SRF point data, enabling a trend analysis to be performed, thereby yielding accurate, potentially meaningful data concerning an extremely deleterious invasive.

THE FLORIDA INVASIVE SPECIES PARTNERSHIP – WORKING TOGETHER TO ACHIEVE SUCCESS

The Florida Invasive Species Partnership (FISP) is a collaboration of federal, state and local agencies together with non-government organizations, formed to link efforts in invasive species prevention and management across agency and property boundaries in Florida. Our mission is to foster partnerships as an additional tool in these efforts by increasing communication, coordination and the use of shared resources. FISP builds community awareness, leverages limited resources through cooperation, and may reduce land management costs. The ultimate goal is to conserve wildlife habitat, working agricultural and forest lands, natural communities and biodiversity in Florida.

In the spirit of partnership, FISP will share what has been achieved since the 2011 SE-EPPC meeting, what we have learned, and open a dialogue with EPPC members from other states to gain additional ideas for the future.
LATE SEASON SELECTIVE CONTROL OF WINTER CREEPER (*Euonymus fortunei*)

Winter creeper is a nonnative invasive plant that was introduced from Asia in 1907 as an ornamental plant. It is commonly planted as an ornamental, and because of ornamental planting and bird-dispersed seeds it has become prominent as a ground cover in disturbed forest areas and poorly managed landscapes. Winter creeper is very competitive, in part, because it retains its leaves year round in some environments. Can application of foliar herbicides achieve selective control of winter creeper, after other desirable species have dropped their leaves? This study was initiated in December, 2011 at the University of Kentucky Arboretum to answer the question asked above. Coralberry (*Symphoricarpus orbiculatus*) was the primary desirable species of concern. Herbicide treatments were applied with a single tipped CO2 sprayer until the leaf surface of the entire plot (0.9 m x 0.9 m) was wet. Most treatments were applied on December 17, 2011. Visual data were collected on plots for percent wintercreeper foliar cover (0-100%) at 96 (3/22/2012), 112 (4/7/2012), and 267 (9/9/2012) days after treatment (DAT). The treatments included the following products (active ingredients): Reward (diquat), Finale (glufosinate), and Roundup Pro (glyphosate) plus a non-ionic surfactant at 0.5% v/v. Coralberry was not killed by any of the treatments but there was some damage to the new foliage visible 112 DAT in the glyphosate plots. The best control of wintercreeper 112 DAT was with the glufosinate treatments (7 to 18% foliar cover) and the glyphosate treatments had poor control (35 to 53% foliar cover). However, by 267 DAT the best glufosinate treatments had 12 to 25% foliar cover while the best glyphosate treatments had 5 to 10% foliar cover.

PROSPECTS FOR BIOLOGICAL CONTROL OF COGONGRASS

Cogongrass, *Imperata cylindrica* (L.) Beauv, is an aggressive, rapidly colonizing invasive weed of pine plantations, livestock pastures, roadsides, railways, reclamation areas, and natural communities in the southeastern U.S. Once established, this federal noxious weed quickly displaces native or planted vegetation, often forming dense monocultures that reduce the productivity and biodiversity in the invaded area and creating a fire hazard. Conventional methods of managing cogongrass are expensive, labor intensive and not sustainable due to the regenerative capacity of cogongrass. We examine prospects for identifying host specific natural enemies of cogongrass in its native Old World range.

THE EFFECTS OF HYDROLOGY ON NODULATION AND NITROGEN ALLOCATION IN THE INVASIVE PLANT, CATCLAW MIMOSA (*Mimosa pigra*)

*Mimosa pigra*, a native of South America, is among the most serious invaders of wetlands, grazing ranges, and cultivated areas around the world, including Australia, Indonesia, and southeastern Asia. *Mimosa pigra* has been identified as a Category I Invasive in South Florida (FLEPPC 2009), where it can be found throughout the urbanized coastal area and in natural areas such as the Loxahatchee River Natural Area. In both its native and non-native range *M. pigra* forms a symbiotic relationship with nitrogen-fixing microorganisms in the genus *Burkholderia*. Fixation of atmospheric nitrogen by *Burkholderia* residing in root nodules can potentially give *M. pigra* better access to this essential
plant nutrient than wetland species that do not form root nodules. The ability to fix nitrogen when dissolved nitrates are not available may give *M. pigra* a competitive advantage in seasonally inundated wetlands. Understanding how water regimes affect nodulation in *M. pigra* has important implications for effective management of this invasive plant in natural wetlands and water treatment areas. In this study we examined the effects of different water levels on nodulation and nitrogen allocation. A total of 25 seedlings were grown from *M. pigra* seeds collected at an invaded site in the Loxahatchee River Natural Area in Palm Beach County. When average plant height reached 8-10 cm, stem height of all plants was measured and 5 plants were harvested to determine above-ground and below-ground biomass. Remaining plants were inoculated with 50g of homogenized soil collected from the root zone of a nodulating field plant, and randomly assigned to drained or inundated treatment groups. At 6 weeks and 12 weeks post-treatment, 5 randomly selected plants were harvested from each treatment group. The number, size, and location of root nodules was determined by light microscopy. Results showed significantly greater nodule formation in plants grown in drained conditions. Results from analyses of the relative content of chlorophyll, protein, DNA and RNA in leaf tissue collected from each plant at the time of harvest will also be presented.

**MYCORRHIZAL SYMBIOSIS AND Lygodium microphyllum INVASION IN SOUTH FLORIDA**

*Lygodium microphyllum* (Old World climbing fern) is one of the most problematic weeds in south Florida, invading numerous habitats from mangroves to pine flatwoods natural ecosystems. Much of the research efforts on *L. microphyllum* has been focused on reproductive potential, spore release, growth under different environmental conditions, belowground rhizome dormancy and survival strategies that describes its invasiveness. However, the role of an important mutualistic association with arbuscular mycorrhizal fungi (AMF) in the competitive ability and successful invasion of *L. microphyllum* by enhancing nutrient uptake has not been previously considered. Analysis of field root and soil samples from the ferns introduced and native range as well as a seven-week growth chamber experiment were done to determine the level of mycorrhizal colonization in the roots of *L. microphyllum* and the dependency on mycorrhizal fungi for growth and phosphorus (P) uptake. The field root samples showed that *L. microphyllum* was heavily colonized by AMF in relatively drier conditions, which are commonly found on some Florida sites compared to more common wetter sites where the fern is found in its native Australia. The results from the growth chamber experiment showed that the mycorrhizal treatment plants had significantly higher relative growth rate and biomass compared to the non-mycorrhizal plants. Similarly, *L. microphyllum* was highly dependent on the mycorrhizal fungi for growth and P uptake. Our results suggest that AMF play a significant role in vegetative reproduction and likely enhance the invasiveness of *L. microphyllum* in south Florida natural areas.
THE FIRST COAST INVASIVE WORKING GROUP—FIGHTING BORDER WARS

The First Coast Invasive Working Group (FCIWG) is a Cooperative Invasive Species Management Area (CISMA) that encompasses Baker, Clay, Duval, Nassau and St. Johns counties in northeast Florida. In recent years, FCIWG has experienced biological invasions from the north and south. Salt cedar (*Tamarix canariensis*) and beach vitex (*Vitex rotundifolia*) have been creeping down from Georgia. Brazilian pepper (*Schinus terebinthifolius*) and Old World climbing fern (*Lygodium microphyllum*) have been advancing from the south. Members of the FCIWG were actually responsible for discovering the northernmost populations of Old World climbing fern. There are two populations in the FCIWG area, one in western Duval County and one in northern St. Johns County. The FCIWG has led efforts to control and prevent the spread of these two populations. This talk will highlight those efforts and discuss other valuable services that the FCIWG provides to the northeast Florida area.

INVASIVE PLANTS ARE NO MATCH FOR VOLUNTEERS! THE FWC VOLUNTEER PROGRAM'S INVASIVE AND EXOTIC PLANT CONTROL VOLUNTEER PROJECT

The Florida Fish and Wildlife Conservation Commission (FWC) Volunteer Program promotes citizen science and stewardship opportunities to residents and visitors throughout Florida. Since 2007, more than 18,000 volunteers of all ages, backgrounds, ethnicities and skills from rural, suburban and urban areas have participated in FWC volunteer projects. And, with the demographics of Florida ever-changing, the FWC Volunteer Program provides a means to reach populations that may not normally have access to conservation-based citizen science and stewardship opportunities. The FWC Volunteer Program works to ensure that projects are well-suited for volunteer participation, the volunteer experience is a success, conservation gains are achieved, and volunteers become stewards for Florida’s natural resources. Restoration of fish and wildlife habitat is critical to conserving species diversity and populations of species native to Florida. And stewardship volunteers play a critical part of addressing FWC conservation challenges, as FWC works to maintain a successful balance between people, priority species and habitats. A vibrant volunteer program is a crucial strategy to ensure that the public is involved in meeting FWC’s public trust responsibilities. FWC volunteers engage in pest plant removal as well as projects that restore land to create additional wildlife habitat.

From July 2011 – June 2012 the FWC Volunteer Stewardship program accomplished the following:

Invasive and exotic plant control
- 14 invasive plant removal workdays on state and other conservation lands
- Located non-treated invasive species for quality control of contractor sprays covering over 30 acres on private, FWC and other public lands
- Maintained upland exotic vegetation (~60 acres) at the Babcock/ Webb WMA
- Chemically treated at least 185 Melaluca trees in the Jetport area of Big Cypress WMA.

Restore Native Habitat through Plantings
• Planted approximately 6,000 native plants on state and other conservation lands
• Planted 2,500 wiregrass plants covering approximately 17 acres within the Chassahowitzka WMA and the Chinsegut/Big Pine WEAs.
• Participated in a longleaf pine survival count, covering approximately 300 acres at the Chassahowitzka WMA
• Planted 280 native oak species on approximately 22 acres at the Half Moon WMA to restore native habitat for the Florida Scrub-Jay.

Prescribed Burn Assistance
• A 1,284 acre prescribed burn at the Everglades WMA
• Five prescribed burns (~1500 acres) at the Babcock/Webb WMA.
• A 540 acre and a 558 acre prescribed burn at the Holey Land WMA
• A 25, 35 and 40 acre prescribed burn at the Guana River WMA
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