Winds of Change
Adaptive Management Under Changing Conditions

April 4-6, 2018
CROWNE PLAZA OCEANFRONT
MELBOURNE, FLORIDA
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FLEPPC 2018 CONFERENCE AGENDA

WEDNESDAY, APRIL 4th OVERVIEW

8:00 – 5:00  Registration – Foyer
8:00 – 5:00  Vendor Set-Up, Poster Set-Up, Silent Auction Set-Up – St Lucia/St Martin Rooms
9:00 – 12:00  FISP/CISMA SESSION – Aruba Room
12:00 – 1:00  Lunch on your own
1:00 – 5:00  Keynote and Plenary Session – Aruba Room
5:00 – 6:30  Poster Session and Welcome Social – St Lucia/St Martin Rooms

SESSION I – WELCOME, KEYNOTE AND PLENARY SPEAKERS – ARUBA ROOM – CEU SESSION ID: 25108
Moderator: Christen Mason

1:00 – 1:10  Welcome and Announcements – Christen Mason, FLEPPC Chair
1:10 – 2:00  Keynote Speaker – Dr. Bethany Bradley, UMass Amherst – Implications of Climate Change for Invasive Species
2:00 – 2:25  Plenary Speaker – Dr. C. Ross Hinkle, UCF – Carbon Dynamics of Selected Ecosystems on Managed Conservation Areas in the Northern Everglades Watershed
2:25 – 2:50  Plenary Speakers – Dr. Alan Franck, USF – The Dynamism of the Florida Flora: Native and Non-Native Range Extensions

2:50 – 3:20  NETWORKING BREAK IN VENDOR ROOM (St Lucia/St Martin Rooms)

SESSION I (CONTINUED) – PLENARY SESSION AND PANEL DISCUSSION – CEU SESSION ID: 25108
Moderator: LeRoy Rodgers

3:20 – 3:30  Review of Keynote/Plenary Session – LeRoy Rodgers
3:30 – 4:20  Keynote and Plenary Speakers Panel Discussion – Moderator: LeRoy Rodgers
4:20 – 4:45  The ABCs of Invasive Species Organizations – Chuck Bargeron

5:00 – 6:30  POSTER SESSION AND WELCOME SOCIAL IN VENDOR ROOM (St Lucia/St Martin Rooms)

THURSDAY, APRIL 5th OVERVIEW

8:00 – 12:00  Registration – Foyer
8:00 – 5:00  Vendor Exhibits, Poster Display, Silent Auction Display – St Lucia/St Martin Rooms
8:00 – 12:15  Oral Presentations – Aruba Room
12:15 – 1:30  Lunch on your own
1:30 – 4:30  Interactive Presentations
4:30 – 6:00  Beach Games Fundraiser
6:00 – 7:00  Banquet – Ocean Deck Pavilion
7:00 – 8:00  Awards, Silent Auction Ends – Vendor Room (St Lucia/St Martin Rooms)

SESSION II – ORAL STUDENT PRESENTATIONS – ARUBA ROOM – CEU SESSION ID: 25109
Moderator: Karen Brown

8:00 – 8:05  Vendor Update – Katharine Murray [Environmental Quality, Inc.]
8:05 – 8:10  Vendor Update – Jeff Clark [EarthBalance]
8:10 – 8:35  Patricia Prade (UF) – Cold Tolerance of Calophya latiforceps and Calophya terebinthifolii Adults, Potential Biological Control Agents of Brazilian Peppertree
8:35 – 9:00  Candice Prince (UF) – Chemical Control of Two Grass Species under Different Salinity Regimes
9:00 – 9:25  Emily Gaskin (UF) – The Air Potato Leaf Beetle: Poster Child for Biological Control Outreach
9:25 – 9:50  Alex Onisko (UF) – Identification and Management of Two New Scleria Species in Florida Wetlands
9:50 – 10:15  NETWORKING BREAK IN VENDOR ROOM (St Lucia/St Martin Rooms)
SESSION III – ORAL PRESENTATIONS – ARUBA ROOM – CEU SESSION ID: 25110
Moderator: Jimmy Lange
10:35 – 11:00 – Hillary Cooley – Invasive Plant Operations Summary for the 2017 Everglades Cooperative Invasive Species Management Area (ECISMA) Summit
11:00 – 11:25 – Jennifer Possley – Optimizing Chemical Control for Burma Reed (Neyraudia reynaudiana) in Miami-Dade County Pine Rocklands
11:25 – 11:50 – Greg Wheeler – Predicting Parasitoid Attack of Potential Brazilian Peppertree Biological Control Agents
12:15 – 1:30 – Lunch on your own

SESSION IV – 1:30 – 3:00 – Stephen Enloe & Greg MacDonald – Interactive Herbicide Presentation – Location TBA – CEU SESSION ID: 25111
3:00 – 3:15 – NETWORKING BREAK IN VENDOR ROOM (St Lucia/St Martin Rooms)

4:30 – 6:00 – BEACH GAMES FUNDRAISER
6:00 – 7:00 – BANQUET – OCEAN DECK PAVILION
7:00 – 8:00 – AWARDS; SILENT AUCTION ENDS IN VENDOR ROOM (St Lucia/St Martin Rooms)

FRIDAY, APRIL 6th OVERVIEW
8:00 – 12:10 – Oral Presentations – Aruba Room
12:20 – Conference Concludes

SESSION VI – ORAL PRESENTATIONS – FAPMS (AQUATICS) SESSION – CEU SESSION ID: 25113
Moderator: Kelli Gladding
8:00 – 8:05 – Vendor Update – Todd Olson [Aquatic Vegetation Control]
8:05 – 8:10 – Vendor Update – Kelli Gladding [SePro]
8:10 – 8:20 – Keith Mangus and Kelli Gladding – The Florida Aquatic Plant Management Society (FAPMS) Update
8:20 – 8:45 – Lyn Gettys – Reproductive Potential of Crested Floatingheart (Nymphoides cristata)
8:45 – 9:10 – Fred Fishel – Water: The Smallest Factor That Makes the Greatest Difference
9:10 – 9:35 – Ashley O’Neal – Temporal and Regional Patterns in Target FLEPPC Taxa – Presence and Abundance in Florida Lakes
9:35–10:00 – Michael Sowinski – Red Root Floater (Phyllanthus fluitans) Update
10:00 – 10:20 – NETWORKING BREAK IN VENDOR ROOM (St Lucia/St Martin Rooms)

SESSION VII – ORAL PRESENTATIONS – ARUBA ROOM – CEU SESSION ID: 25114
Moderator: Greg MacDonald
10:20 – 10:30 – Vendor Update – Dan Mixson (Bayer)
10:30 – 10:55 – Ernie Franke – Communities Come Together to Remove Invasive Trees
10:55 – 11:10 – FLEPPC BUSINESS MEETING (Prize drawing mid-meeting)
11:10 – 11:35 – Greg MacDonald – Invasive Plant Management in Natural Areas – Maintenance Interval Plans
11:35 – 12:00 – Chuck Bargeron – Spatial Invasive Infestation and Priority Analysis (SIIPA) Tool in EDDMapS
12:00 – 12:25 – Dale Halbritter – Expected Impact and Mass Production of the Thrips Biological Control Agent of Brazilian Peppertree
12:10 – 12:20 – Christen Mason/Jimmy Lange – CONFERENCE CONCLUSION REMARKS
ABSTRACTS – ORAL PRESENTATIONS

(in order by program agenda)

WEDNESDAY, APRIL 4, SESSION I – KEYNOTE AND PLENARY SPEAKERS
Moderator: LeRoy Rogers

IMPLICATIONS OF CLIMATE CHANGE FOR INVASIVE SPECIES

Bethany A. Bradley, Department of Environmental Conservation, University of Massachusetts, Amherst, MA, (413) 545-1764, bbradley@eco.umass.edu

BIO: Dr. Bethany Bradley is an Associate Professor of biogeography and spatial ecology. She is interested in how the geographical locations of species across landscapes and regions can inform ecological understanding of species distributions, invasion risk assessments, and conservation planning. Her research has a strong focus on terrestrial plant invasions, with a goal of understanding how invasion risk varies spatially in the context of anthropogenic disturbance and climate change.

ABSTRACT: Invasive species and climate change are two of the most prominent forms of anthropogenic global change identified by the Millennium Ecosystem Assessment. Invasive species have pronounced negative impacts on native species and ecosystem function, and there is ongoing concern that these impacts will be exacerbated with climate change. But, for most invasive species and invaded ecosystems, the outcomes of this interaction remain unknown. Therefore, this presentation aims to review the current state of knowledge about how climate change is likely to influence invasive species. The presentation covers the following topics: Effects of rising temperature, potential range shifts, novel disturbance regimes, and plant response to rising CO₂. 1. Rising temperature could benefit invasive species directly by increasing growth rates relative to native species, and by expanding the growing season to create more opportunities in time for invasive species to establish and thrive. 2. Warming and altered precipitation are already causing the ranges of species to shift, including invasive species. But, many invasives are already widely introduced and will have a head start relative to native. 3. Climate change is likely to lead to a ‘peakier’ precipitation cycle, increasing both drought and flood events. Invasive species tend to thrive under these conditions with higher disturbance. 4. Finally, although rising CO₂ provides a resource for all plants, invasive plants consistently outperform native plants with elevated CO₂ and are more resistant to herbicides. Collectively, these findings suggest that we should be on the lookout for invasive species expanding into new landscapes, emerging earlier in the growing season, and becoming even more competitive.

CARBON DYNAMICS OF SELECTED ECOSYSTEMS ON MANAGED CONSERVATION AREAS IN THE NORTHERN EVERGLADES WATERSHED

C. Ross Hinkle, Professor of Biology, Department of Biology, University of Central Florida, 4110 Libra Dr., Orlando, FL 32816, rhinkle@ucf.edu

BIO: Dr. Hinkle’s primary research interests are in plant ecology, landscape ecology, and applied conservation biology. From 1994 through 2007 he served as Co-Principal Investigator of a multidisciplinary team of scientists who experimentally evaluated ecosystem responses to double ambient atmospheric CO₂ including ecosystem carbon dynamics, above and below ground biomass production, ecosystem water dynamics, ecosystem response to fire, nutrient cycling, and ecosystem structural components. He continues that research at UCF where he directs the Ecosystem Processes and Services Laboratory that is investigating carbon, energy, and water dynamics in native and urban ecosystems in Central Florida. Other research interest areas include fire ecology and landscape management, invasive species management, restoration ecology of degraded habitat, and the establishment of long term ecological monitoring and research of conservation areas. He represents UCF on a national team of scientists who are implementing the National Ecological Observatory Network (NEON) with the National Science Foundation to address national priorities for ecological research. He works with The Nature Conservancy to coordinate a NEON site at Disney Wilderness Preserve. He has been an active member of the Brevard County...
Environmentally Endangered Lands Selection and Management Committee since 1990, a program that has selected and purchased over 24,000 acres of native Florida habitat for management as conservation sanctuaries. Dr. Hinkle has authored or co-authored over 80 scientific papers.

**ABSTRACT:** Disney Wilderness Preserve (DWP), Kissimmee, Florida has been restored to native ecosystems from a former cattle ranch. It is a significant landscape in the Greater Everglades Watershed that is managed as a conservation area. There was extensive wetland reclamation and restoration on the site as well as a reintroduction of fire to manage the native pine flatwoods. Measurements of atmospheric C flux have been made in a longleaf pine flatwoods and wetlands ecosystems at DWP since January 2010. The period of these measurements has spanned two fire return intervals at the flatwoods site and several hydrological cycles in the wetlands. C stock measurements of aboveground biomass have also been made at the pine flatwoods site immediately before, immediately after, and one year after a prescribed fire that occurred during the measurement period. We found these ecosystems typically serve as a net sink of C; however, the system becomes a net source of C immediately following a fire event, recovering to a net sink of C within @6 weeks of fire. Methane emissions from the wetlands site offset some of the gains attributed to carbon sequestration. In addition to the influence of fire regimes, it was found that hydrologic conditions play an important role in the magnitude of C storage in this landscape. Despite the variability of rainfall between years, the study found this ecosystem provides the service of C sequestration even in the context of frequent prescribed fire management.

**THE DYNAMISM OF THE FLORIDA FLORA: NATIVE AND NON-NATIVE RANGE EXTENSIONS**

**ABSTRACT:** The flora of Florida is markedly dynamic, with continual range expansions at the county, state, and national level. In many cases, it is difficult to ascertain if the expansions were due to human-aided dispersal or other natural vectors (e.g. birds). Some notable examples are discussed. Two natives, *Cissus verticillata* and the commonly cultivated *Myrcianthes fragrans*, have been documented further up the west coast. *Roystonea regia*, also commonly cultivated, is recently documented in Martin County. Populations of *Azolla pinnata*, *Oeceoclades maculata*, *Phyllanthus fluitans*, and *Praxelis clematidea* continue to expand. Three species of Cyperaceae (*Eleocharis elegans*, *Scleria eggersiana*, and *Scleria microcarpa*) known from the Neotropics were found established in marshes and swamps. Old World species recently showing up include *Causonis trifolia*, *Cissus quadrangularis*, and *Phyllanthus debilis*. A few species have been reported without herbarium documentation: *Crepis capillaris*, *Eulophia andamenensis*, and *Philydrum lanuginosum*.

**THE ABCs OF INVASIVE SPECIES ORGANIZATIONS**

**BIO:** Chuck Bargeron is the Associate Director of Invasive Species and Information Technology at the Center for Invasive Species & Ecosystem Health (Bugwood) and has a Public Service Faculty appointment split between the Warnell School of Forestry and Natural Resources and the Department of Entomology at the University of Georgia. He has been with the University of Georgia since 1999 where he has developed web applications, smartphone applications, interactive CD-ROMs, databases and outreach publications. Websites that Chuck has designed for the University of Georgia have been featured twice in Science Magazine, received regional awards for content and design, and have received over 1 billion hits in the last 10 years.
ABSTRACT: Sometimes invasive species organizations can be as confusing as the invasive species they are trying to protect us from and educate us about. This presentation will give an overview of the major national organizations and what their individual focus is. It will highlight their scope, membership and the taxa on which they concentrate.

THURSDAY, APRIL 5, SESSION II – STUDENT ORAL PRESENTATIONS
Moderator: Karen Brown

COLD TOLERANCE OF CALOPHYA LATIFORCEPS AND CALOPHYA TEREBINTHIFOLII ADULTS, POTENTIAL BIOLOGICAL CONTROL AGENTS OF BRAZILIAN PEPPERTREE (STUDENT PRESENTATION)

Patricia Prade¹, Carey R. Minteer¹, Emily Gaskin¹, and James P. Cuda².
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² Department of Entomology & Nematology, University of Florida, Gainesville, 352-273-3921, jcuda@ufl.edu

BIO: Patricia Prade is a PhD student in the Entomology Department at the University of Florida. Her research is focused on the biological control of Brazilian peppertree in Florida.

ABSTRACT: Cold temperatures can be lethal to insects and understanding the cold tolerance of potential biological control agents is important to evaluate the suitability of the insect to the new environment. Brazilian peppertree – BP (Schinus terebinthifolia) is one of the most serious invasive plants in Florida. Two leaf gall-inducing insects, Calophya latiforceps and C. terebinthifoli was discovered feeding on BP from different climatic regions in Brazil. The objectives of this study were to determine the influence of cold temperature on adult survival and predict the potential distribution of adults in Florida. Twenty newly emerged adults were released in a vial with a flush of BP. Adults were acclimated at intervals of 5°C in growth chambers set at 15, 10 or 5°C for 24 h. Adults were exposed to 5°C for 0 (control), 2, 4, 8, 16 and 32 days, to 0°C for 0 (control), 1, 2, 3, 6, 12 and 24 days; and to -5°C for 0 (control), 0.5, 1, 2, 4, and 8 hours in growth chambers. After the exposure time, vials with adults were placed at room temperature, and survival evaluated after 24h. At -5°C, C. terebinthifolii had an LT₅₀ of 2.5 hours and LT₉₉ of 11 hours; C. latiforceps LT₅₀ was 15 min and LT₉₉ of 8 hours. At 0°C, C. terebinthifolii had an LT₅₀ of 7 days and LT₉₉ of 13 days and C. latiforceps had an LT₅₀ of 1 day and LT₉₉ of 6 days. At 5°C, the LT₅₀ and LT₉₉ for C. latiforceps were 4 days the and 10 days, respectively. The results showed that C. terebinthifolii was the most cold tolerant for all temperatures. However, based on climate history of Florida and the current distribution of Brazilian peppertree, both C. latiforceps and C. terebinthifolii could establish in the areas where BP is present.

CHEMICAL CONTROL OF TWO GRASS SPECIES UNDER DIFFERENT SALINITY REGIMES (STUDENT PRESENTATION)

Candice M. Prince¹ and Greg E. MacDonald²
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BIO: Candice Prince is a doctoral candidate in the Environmental Horticulture Department at the University of Florida. Her research focuses on the response of invasive grasses to environmental change, and how these responses impact management. Candice also received her Bachelors of Science from the University of Florida in 2014, majoring in Plant Science with an emphasis on Restoration Horticulture.

ABSTRACT: Environmental conditions (salinity, flooding, drought, etc.) have an effect on morphological and physiological features of plants, including leaf traits, biomass allocation, and growth rate. Changes in these features can impact how herbicide is absorbed and translocated by plants. This may present management challenges for species that can grow in a variety of environmental conditions, such as Panicum repens (torendgrass) and Phragmites australis (common reed). To understand how salinity affects herbicide efficacy,
we grew plants of each species in freshwater (0.7 ppt) or saline (15 ppt) conditions in a greenhouse. After 2 weeks of growth, we measured height, stem number, leaf number, leaf area, and above- and below-ground biomass. We then treated plants with either imazapyr (0.125, 0.25, 0.5, or 1 lb. a.e. per acre) or glyphosate (0.5, 1, 2, or 4 lb. a.e. per acre) (4 replications per treatment, plus an untreated control, per salinity regime). Thirty days after treatment (DAT), we measured injury, height, stem number, and aboveground biomass. Sixty DAT, we measured height, stem number, as well as above- and below-ground biomass. Torpedograss showed reductions in height, leaf number, stem number, biomass, and growth rate under high salinity conditions. In addition, torpedograss showed lowered susceptibility to herbicide treatments (particularly for glyphosate) under these conditions, likely due to lower growth rate and leaf number. Common reed was unaffected by our salinity treatments, and salinity had little effect on herbicide efficacy for this species.

THE AIR POTATO LEAF BEETLE: POSTER CHILD FOR BIOLOGICAL CONTROL OUTREACH (STUDENT PRESENTATION)

Emily J. Gaskin, Carey Minteer, Patricia Prade, Eutychus Kariuki
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BIO: Emily is an undergraduate student with the College of Agriculture and Life Sciences at the University of Florida, studying environment management in agriculture and natural resources.

ABSTRACT: Florida’s tropical/sub-tropical climate makes the state more susceptible to problems with invasive weeds than others. Air potato (Dioscorea bulbifera L.), which is a twining vine with heart shaped leaves, is considered one of the most problematic weeds in Florida due to its ability to grow quickly and outcompete native vegetation for resources. A leaf-feeding beetle from Asia, Lilioceris cheni Gressit and Kimoto (Coleoptera: Chrysomelidae), was released in 2011 as a biological control agent of air potato. The University of Florida, in conjunction with other state agencies, mass rears these insects for release on public/private lands, as well as for use in community outreach events to educate the public about invasive weeds and classic biological control. Outreach and education focusing on invasive weeds and biological control is conducted at various community events within Florida. Information about air potato biological control is presented to the public in the form of vertical banners, brochures, verbal conversations/lessons, and visual displays of L. cheni, air potato, and other weed targets. To track knowledge gained, a brief survey was created and conducted in the form of a pre- and post-lesson questionnaire. Responses were given on a scale of 1-10, with 1 indicating little to no knowledge, and 10 being very knowledgeable. Knowledge of invasive species and biological control was found to be increased by an average of 285%. Perception of the safety and effectiveness of biological control increased by an average of 381%. Children are simply asked whether they had learned something, of which 181 participants indicated that they had. These results suggest that these community events are an effective way to distribute information to the public about the dangers of invasive weeds such as air potato and the safety of their biological control agents such as the air potato leaf beetle.

IDENTIFICATION AND MANAGEMENT OF TWO NEW SCLERIA SPECIES IN FLORIDA WETLANDS (STUDENT PRESENTATION)

Alexandra Onisko¹, Greg MacDonald², Ellen Allen³, and LeRoy Rodgers⁴
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BIO: Alex Onisko is an Invasive Species Biologist with the South Florida Water Management District. Alex has worked in the areas of resource management, restoration, and invasive species control in natural areas in Florida since graduating from the University of Central Florida in 2010. Alex’s current focus is management of upland and wetland invasive plant species in natural areas. She is also a graduate student researching non-native Scleria species biology and management and is working towards graduating with a Master’s in Agronomy from the University of Florida.

ABSTRACT: Two previously undocumented species of Scleria have been identified in Florida’s natural areas in recent years. Scleria microcarpa, positively identified in 2015 has been observed in cypress and hardwood
swamps along shorelines of several lakes and canals in the Kissimmee Chain of Lakes. Populations of this plant increased from otherwise unnoticed, benign clusters to dominating the understory in some littoral zones. The South Florida Water Management District designed and implemented a set of herbicide trials to learn how to control this species. The trials included five active chemicals; glyphosate, 2,4-D, flumioxazin, imazamox, and triclopyr as well as combinations of glyphosate/2,4-D, glyphosate/flumioxazin, flumioxazin/imazamox, and glyphosate/imazamox. Glyphosate at 2% concentration was the most effective treatment and was replicated, resulting in a large infestation (376 acres) of *Scleria microcarpa* being successfully treated. Maintenance and additional initial treatments are planned for this year.

Another species of *Scleria*, *S. eggersiana* was positively identified at Okaloacoochee Slough State Forest (OK Slough) in June 2017, also occupying the understory of cypress swamps. This population is the only known occurrence of *S. eggersiana* in the continental US. There is an ongoing effort to educate land managers on identification and to document this species to learn more about its biology, habitat preferences, and possible impacts on natural communities.

This presentation will provide attendees the skills to identify *S. microcarpa* and *S. eggersiana*. Attendees will be given a treatment update on *S. microcarpa* treatments and will learn about the best ways to document sightings of both species. With the arrival of these species to Florida, land managers are tasked with contemplating questions of whether to quickly respond to these species arrival on the landscape by attempting to eradicate them or whether these species warrant allocating sometimes scarce resources towards their control.

**THURSDAY, APRIL 5 – SESSION III – ORAL PRESENTATIONS**

**Moderator: Jimmy Lange**

**2018 UPDATE ON THE INVASIVE PLANT MANAGEMENT ASSOCIATION (IPMA)**

**James L. Burney, Jr.** President. Invasive Plant Management Association. 1860 W 10th Street, Riviera Beach, Florida, 33404; jburney@avcaquatic.com; (561)719-9484

**BIO:** James L. Burney, Jr. is the current President of the Invasive Plant Management Association. He earned a BS in Biological Sciences in 1987 and MS in Biological Sciences in 1995, both from University of Central Florida, and a Professional Wetland Scientist certification in 1995 from the Society of Wetland Scientists. He is also BOD Chair of Aquatic Vegetation Control, Inc. and has over 33 years’ experience managing wildlife and vegetation communities.

**ABSTRACT:** In response to the continual challenges facing the funding of invasive plant management operations during each State Legislative Session and the 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 2012. IPMA was organized with the intent to provide the voice of upland and aquatic invasive plant management during our inaugural 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.” IPMA’s Strategic Outlook remains to foster an ingrained legislative culture of sustainable State funding for invasive plant control through continued representation by the lobbying firm Lewis, Longman, & Walker, PA. Specific goals include: Maintaining (or increasing) the FWC’s Invasive Plant Management Fund; Representing invasive plant management as an integral component of the Land Acquisition Trust Fund with its own dedicated funding level; and Continuing support of dedicated funding for invasive plant management on other State lands (in lieu of FWC Trust money) and all IPM Budget line items. The purpose of this presentation is to provide a summary of FY 2017-18 budget successes, a FY 2018-19 legislative update, and strategic goals for the State’s FY 2018-19 Budget.

**INVASIVE PLANT OPERATIONS SUMMARY FOR THE 2017 EVERGLADES COOPERATIVE INVASIVE SPECIES MANAGEMENT AREA (ECISMA) SUMMIT**

**Hillary C. Cooley**, and ECISMA Plant Operation’s Collaborators, Everglades National Park, 40001 State Road 9336, Homestead, FL 33034, 305-242-7875, Hillary_Cooley@nps.gov
**BIO:** Hillary Cooley is currently a Botanist for Everglades and Dry Tortugas National Parks, and focuses on the management of invasive exotic vegetation. Hillary has an Associate of Applied Science for Paul Smith’s College, a Bachelor’s Degree from Kent State University and a Master’s Degree from Florida International University. Before becoming a Botanist at Everglades National Park, Hillary conducted fire effects monitoring at both Everglades and Grand Canyon National Parks. Hillary served as the Florida Exotic Pest Plant Counsel’s Secretary from 2010 until 2013.


**OPTIMIZING CHEMICAL CONTROL FOR BURMA REED (NEYRAUDIA REYNAUDIANA) IN MIAMI-DADE COUNTY PINE ROCKLANDS**

Jennifer Possley, Stephen Enloe, Joe Maguire, Jose Prieto, and Sonya Thompson

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**BIO:** Jennifer Possley is a field biologist and a member of Fairchild’s “Conservation Team.” She maps, monitors and researches the rare flora of Miami-Dade County and has a special interest in ferns. She also helps to steer the garden’s Connect to Protect Network. Prior to joining Fairchild’s staff in 2001, she received a B.A. in biology from Kalamazoo College and a M.S. in agronomy from the University of Florida. She is originally from the village of Dexter, Michigan.

**ABSTRACT:** For 25 years, Miami-Dade County has dedicated significant resources toward combating Burma reed (Neyraudia reynaudiana). This large cane grass is extremely invasive in pine rocklands—a globally critically imperiled plant community of which >98% has been lost to development in urban Miami. The current control techniques used by Miami-Dade crews includes cutting off the culms at the base, waiting until regrowth reaches 1-2 feet, then spraying the fresh foliage with 5% glyphosate. This control method has been a success in controlling Burma reed. However, it is labor intensive and requires two site visits for effective control, which is not always feasible. The goal of this study was to find the most effective method to kill outlying clumps of Burma reed in a single treatment (that is, without the need to return and spray regrowth). In container trials at the nursery of Fairchild Tropical Botanic Garden and then in field trials at Zoo Miami, we compared two different application methods (cut & dribble versus cut and spray regrowth), and four different chemicals (glyphosate, triclopyr, and the graminicides sethoxydim and fluazifop), at different rates and in different carriers. Both container and field trials showed that the cut & dribble treatment was a superior application method and required only a single site visit for control. Furthermore, both graminicides showed significant promise as cut stem treatments. These results are very promising for improving both applicator efficiency and increasing selectivity for Burma reed control in pine rocklands.

**PREDICTING PARASITOID ATTACK OF POTENTIAL BRAZILIAN PEPPERTREE BIOLOGICAL CONTROL AGENTS BY ASSESSMENTS IN THE NATIVE AND INVADED RANGES**

Greg Wheeler and F. Mc Kay

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**BIO:** Greg Wheeler is the Supervisor of USDA/ARS Invasive Plant Research Laboratory and continues to work on the IPM Program of Brazilian Peppertree in South Florida. In 2004, Greg joined the IPM Program as a project assistant working on the parasitoid survey and development of an integrated pest management strategy for Brazilian Peppertree in South Florida. In 2007, Greg became the Project Leader of the IPM Program and during his time with the program he has worked on many projects related to Brazilian Peppertree, including biological control, invasive species in South Florida, and natural enemies of invasive species. Greg has a Ph.D. in Entomology from the University of Florida.
**BIO:** Gregory Wheeler has been working on biological control of weeds for over 20 years. He focuses primarily on the development of new agents of Brazilian peppertree and Chinese tallowtree.

**ABSTRACT:** Natural enemies may reduce the effectiveness of weed biocontrol agents and can also cause environmental damage to a shared native insect host. Classical biological control agents are screened during quarantine to eliminate natural enemies that might have attacked the insects when collected in their native range. This is thought to release these insects from the biotic constraints of natural enemies and assist them to more fully realize their biotic potential in the introduced range. However, after release, the effect of some agents can be compromised by the accumulation of natural enemies in the weed’s introduced range. Estimates of agent susceptibility to natural enemies, however, are rarely assessed prior to release. Susceptibility to attack by natural enemies was predicted by two methods, 1) determine parasitoid impact in the area of origin and 2) examine ecological analogues in the invaded range where the agent will be released. Our survey results for the invasive weed Brazilian peppertree looking at potential agents in their native range of Argentina and Brazil indicate parasitism rates were generally low, Geometridae 9.0 %, *Paectes* spp. 16.0 %, *Episimus* 12.4 %, thrips < 1%. Parasitism of the ecological analogues in Florida was similar: Geometridae 0.0 %, *Paectes* spp. 18.3 %, *Episimus* 15.2 %, and thrips 0%. These results suggest that if species of these defoliating caterpillars (Geometridae, *Paectes*, and *Episimus*) are released for biological control in Florida they will be parasitized at these approximate levels. On the other hand, if a thrips is released, these results suggest very low, if any, parasitism would result. These pre-release assessments of parasitism may assist in the prioritization of potential biological control of weeds agent species.

**HERBICIDE EFFICACY TRIALS AND PROMISING NEW HERBICIDE TECHNOLOGIES FOR OLD WORLD CLIMBING FERN CONTROL (LYGODIUM MICROPHYLLUM)**

**Jonathan S. Glueckert**1, **Stephen F. Enloe**2

1University of Florida, Center for Aquatic and Invasive Plants, Gainesville, FL, 631-332-2882, jglueckert@ufl.edu; 2352-392-6841, sfenloe@ufl.edu

**BIO:** Jonathan Glueckert is a biologist at the University of Florida Center for Aquatic and Invasive Plants. His position is part of a multi-agency partnership between the Center for Aquatic and Invasive Plants, FWC, South Florida Water Management District, and the US Fish & Wildlife Service. His research is focused on finding better management practices through new herbicides and new application approaches for Old World Climbing Fern. He is based out of the Arthur R. Marshall Loxahatchee National Wildlife Refuge in Boynton Beach, FL.

**ABSTRACT:** Old World climbing fern (*Lygodium microphyllum*) is an aggressive invasive fern that is native to Africa, Asia, and Australia. It was first detected in Florida in Martin County in 1960 and has since spread throughout South and Central Florida, with isolated populations observed as far North as Jacksonville. OWCF is one of the most difficult invasive plants to manage in Florida due to its wind dispersed spores, tolerance to flooding, and its tendency to grow in areas with challenging access and stipulations that limit treatment methods. Over the last decade, glyphosate and metsulfuron have been the only viable herbicides that provide control, yet the fern continues to advance. In 2016 a partnership was formed between the UF Center for Aquatic and Invasive Plants, FWC, SFWMD, and the Arthur R. Marshall Loxahatchee NWR to reinvigorate research of better management practices for OWCF. This talk will focus on results from over a dozen studies initiated during the last two years that are helping to develop tools and strategies such as new tank mixes, recently registered herbicides and glyphosate alternatives.

**THURSDAY, APRIL 5 – INTERACTIVE PRESENTATIONS**

**SESSION IV – INTERACTIVE HERBICIDE PRESENTATIONS**

**Stephen F. Enloe** and **Greg MacDonald**

Center for Aquatic and Invasive Plants and Agronomy Department, University of Florida, Gainesville, FL, sfenloe@ufl.edu; pineacre@ufl.edu

**BIO:** Dr. Enloe has been involved with invasive plant research and extension for the past 20 years. He has worked throughout the western and southeastern United States, including California, Colorado, Wyoming,
Alabama, and now Florida. Over the last nine years, Dr. Enloe has worked extensively on cogongrass, Chinese privet, Chinese tallowtree, Japanese climbing fern, Chinaberry tree, and a host of other invasive plants. He has also recently worked in the area of bioenergy with an emphasis on preventing potential bioenergy species from becoming the next big invader. Dr. Enloe earned his Ph.D. at UC Davis in Plant Biology under Joe DiTomaso, a Master’s degree in weed science from Colorado State University under Scott Nissen, and an undergraduate degree in Agronomy from NC State.

**BIO: Dr. MacDonald** is a professor of Weed Science/Agronomy and teaches undergraduate and several graduate weed science and crop production courses, including on-line distance education courses. He investigates the physiology, ecology and management of invasive species, focusing on perennial grasses – cogongrass, in particular. He also conducts research on the physiological aspects of herbicides in aquatic systems and mechanisms of herbicide resistance in aquatic plants. In addition, he is actively involved in international development with an emphasis on peanut production, utilization, and value added marketing.

**ABSTRACT:** Managing invasive plants in Florida’s natural areas is an ongoing and difficult challenge for land and resource managers. Preventative, biological, chemical and mechanical methods are integrated in an overall approach, but herbicides (chemical) are still the most often utilized form of control. Herbicides can be utilized in a variety of non-traditional application techniques, from foliar spot treatments to basal bark and cut stump treatments. Herbicide formulation, carrier solution (including adjuvants), and carrier volume can play an important role in the success of treatments. Nearly all herbicides were developed for weed control in cropping systems, so development of novel techniques and uses, coupled with careful practitioner observations, have led to the use patterns and recommendations for many of our invasive species. This workshop will discuss the various aspects of herbicides, including mode of action, formulations, adjuvant and specialized carriers, application technologies and native species response. These aspects will be linked to current recommendations for control and management.

**SESSION V – THE GARDEN OF GOOD AND EVIL – PLANT IDENTIFICATION SESSION**

**Christopher Matson**
Florida Park Service, District 3 Environmental Specialist III, Apopka, FL, (407) 553-4371, Christopher.Matson@DEP.State.FL.US

**BIO:** Chris Matson is a district biologist with Florida State Parks and the Fire Coordinator for District 3. He has hosted invasive plant ID workshops at The Nature Conservancy’s Disney Wilderness Preserve as training for invasive species technicians, as well as for local land managers seeking current information. He has several minor published pamphlets/handouts that assist local land managers as quick references for ID of grasses and sedges. He has a degree in restoration ecology from Prescott College in Prescott, AZ and has worked in various capacities with the Wisconsin Department of Natural Resources, The MN/SD and IL Chapters of The Nature Conservancy, The Nature Conservancy’s Disney Wilderness Preserve, and the FL Fish and Wildlife Conservation Commission.

**ABSTRACT:** There are approximately 1,500 non-native, naturalized plants in Florida. More than 160 species are included in the FLEPPC 2017 List of Invasive Plants. Land managers’ likelihood of identifying these species in the field is greatly increased if they have previously seen them and had them botanically described by an expert. This presentation will give attendees an introduction to more than 40 invasive species, using live plant material, that are on the FLEPPC Plant List or are known to be invasive. Field identification tips, growth habits and life history will be covered for these plants as well as tips on how to distinguish them from some of their native look-alikes. Weeds from all regions of Florida will include non-native trees, grasses, vines, ferns and aquatics.

**FRIDAY, APRIL 6 – SESSION VI – ORAL PRESENTATIONS – AQUATICS**

**Moderator: Kelli Gladding**

**THE FLORIDA AQUATIC PLANT MANAGEMENT SOCIETY (FAPMS)**

Keith Mangus¹ and Kelli Gladding²
¹Applied Aquatic Management, Inc., 863-533-8882, keith@appliedaquaticmgmt.com
²SePro Corporation, 386-409-1175, KelliG@sepro.com
**BIO:** Keith Mangus is the current president of the Florida Aquatic Plant Management Society (FAPMS). Mr. Mangus has been an active member of FAPMS since he started in the industry in 1996 as a Licensed Applicator for Applied Aquatic Management, Inc. (AAM). Keith was awarded the FAPMS Applicator of the Year award in 2008. During his tenure with AAM, Keith has been instrumental in many of AAM’s projects as both an applicator and/or supervisor. Currently, Keith manages a team of licensed applicators on governmental projects for AAM; these clients include various county and city governments as well as the SFWMD, FFWCC and the ACOE. Likewise, Keith is involved with the planning, scheduling and execution of large and small-scale treatments for nuisance aquatic vegetation. Keith manages these project operations daily around the entire State of Florida.

**BIO:** Kelli Gladding graduated from Rollins College with her bachelor’s degree in Environmental Science. Presently, Kelli is a representative with the SePRO Corporation and provides technical support to applicators and managers around the State of Florida. She was the Co-Chair for the East Central Florida Cooperative Invasive Species Management Area (CISMA) for 7 years and served on the Board of Directors for the Florida Aquatic Plant Management Society (FAPMS) 2015-2017 and is President-Elect for FAPMS. From 2004 to 2014, Kelli worked for the Florida Fish and Wildlife Conservation Commission, Invasive Plant Management Section as a Regional Biologist focused on aquatics and managing the St. Johns River.

**ABSTRACT:** The Florida Aquatic Plant Management Society (FAPMS) was founded in 1976 and is an aquatic plant manager based society. Recently, FAPMS updated their strategic plan which involves education and outreach. FLEPPC and FAPMS have some overlap since both organizations focus on habitat management but differ in the ecosystems managed. FLEPPC and FAPMS are working together to better support both organizations.

**REPRODUCTIVE POTENTIAL OF CRESTED FLOATINGHEART (NYMPHOIDES CRISTATA)**

Lyn Gettys, PhD, Assistant Professor – Aquatic and Wetland Plant Science, University of Florida, Fort Lauderdale Research and Education Center, Davie FL, 954-577-6331, lgettys@ufl.edu

**BIO:** Dr. Lyn Gettys is an Assistant Professor of Agronomy (Aquatic and Wetland Plant Science) at the University of Florida IFAS Fort Lauderdale Research and Education Center in Davie. Her research focuses on the biology and ecology of native and introduced aquatic and wetland plants and evaluation of control methods for managing invasive species. She holds a BS in Horticulture from UF, an MS in Plant Breeding from North Carolina State University, and a PhD in Plant Genetics from UF.

**ABSTRACT:** Crested floatingheart is a highly ornamental water garden plant with heart-shaped leaves and cheerful white flowers. The species escaped cultivation and was first found in Florida’s waters in the late 1990s. Crested floatingheart was added to the FLEPPC list as a Category II plant in 2003, upgraded to a Category I plant in 2009, and added to the FDACS Noxious Weeds List in 2014. In this presentation Dr. Gettys will discuss the species’ capacity for vegetative reproduction and current research focused on management of this noxious weed.

**WATER: THE SMALLEST FACTOR THAT MAKES THE GREATEST DIFFERENCE**

Fred M. Fishel, Professor, Agronomy Department, University of Florida, Gainesville, FL, (352) 392-4721, weeddr@ufl.edu

**BIO:** Dr. Fred Fishel is Professor of Agronomy and Director, Pesticide Information Office, University of Florida/IFAS since 2005. His primary responsibility is developing study materials and certification exams for applicators of pesticides to meet state licensing requirements. Other responsibilities reside in developing general pesticide education materials and support of county extension agent programming on the local level. He teaches a graduate level course, IPM 5305, “Principles of Pesticides” each spring semester. Prior to this current position, Dr. Fishel had been in a similar position at the University of Missouri - Columbia since 1993.
ABSTRACT: Although water comprises at least 95 to 99 percent of spray mixtures containing herbicides, many applicators are not knowledgeable of their water’s chemistry. Research since the 1970’s have shown that hard water can significantly impact the effectiveness of certain herbicides, especially those characterized as weak acids, including 2,4-D, dicamba, and glyphosate. The pH of water can also impact pesticidal effectiveness as Florida’s water sources tend to be alkaline in reaction. Applicators are encouraged to have their water tested for its chemical properties. Based on test results, the addition of an adjuvant may be recommended to overcome the problems associated with water used in pesticide spray mixtures.

TEMPORAL AND REGIONAL PATTERNS IN TARGET FLEPPC TAXA PRESENCE AND ABUNDANCE IN FLORIDA LAKES

Ashley O’Neal, Nia Wellendorf, Janis Morrow
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BIO: Ashley O’Neal is an Environmental Consultant at the Florida Department of Environmental Protection (DEP) in Tallahassee. Her work at DEP focuses on biological assessment methods for Florida’s surface waters (lakes, streams, and wetlands), and her duties include training, auditing, and assisting with method development and refinement. She has a B.S. in Natural Resources from the University of the South (Sewanee) and an M.S. in Ecology and Evolutionary Biology from the University of West Florida.

ABSTRACT: The Lake Vegetation Index (LVI) is a multi-metric tool which assesses lake health based on plant community structure. The Florida Department of Environmental Protection (DEP) uses the LVI as the primary measure of biological condition in lakes, as part of the Impaired Waters Rule, Chapter 62-303, F.A.C. The LVI consists of 4 metrics, which were chosen based on their correlation with an independent human disturbance gradient (HDG): percent native taxa, percent sensitive taxa, percent Florida Exotic Pest Plant Council Category 1 (FLEPPC 1) taxa, and Coefficient of Conservatism (CC) score of the dominant/co-dominant taxa. The LVI field method involves dividing a lake into 12 sections, and identifying the plant taxa in 4 of the 12 sections to the lowest practical taxonomic level. Unknown plants are collected for expert identification in the lab. DEP investigated the patterns of target FLEPPC taxa distribution in lakes sampled for the LVI. Using LVI data collected by DEP from 2005-2016 (888 lakes, 1744 samples), we calculated the frequency of FLEPPC taxa presence and dominance/co-dominance in Florida lakes. Lakes included were sampled as part of targeted and probabilistic state monitoring programs. We investigated regional and temporal patterns in target FLEPPC taxa presence and dominance. Key findings were that a high percentage (89%) of Florida LVI-sampled lakes had at least one target FLEPPC taxon present, and that 48% had 5 or more FLEPPC taxa present. Forty-five percent of lakes had at least one FLEPPC taxon as dominant or co-dominant, and 11% had 2 or more FLEPPC taxa as a dominant or co-dominant. Panicum repens, Hydrilla verticillata, Ludwigia peruviana, Oxycaryum cubense (not FLEPPC, but target) and Eichornia crassipes ranked highest in frequency of dominance among target FLEPPC taxa. Panicum repens is very frequently a dominant taxon, (19% of LVI-sampled lakes), but does not appear to be increasing in frequency of dominance over time.

RED ROOT FLOATER (PHYLLANTHUS FLUITANS) UPDATE

Michael Sowinski – Florida Fish and Wildlife Conservation Commission, Invasive Plant Management Section Regional Biologist, 863-578-1123, Michael.Sowinski@MyFWC.com

BIO: Michael has a B.A. in Freshwater Biology from the State University of New York at Buffalo; 20 years of experience in the environmental field and over 12 years with the Florida Fish and Wildlife Conservation Commission, the last 10 with the Invasive Plant Management Section. Duties include aquatic plant management and assisting homeowners with aquatic plant management and triploid grass carp permits in Charlotte, Sarasota, Manatee, Hardee, and Desoto counties. Michael conducts upland plant management on public conservation lands in Pinellas, Hillsborough, Highlands, Polk, Lake, Sarasota, Manatee, Hardee, and Desoto counties.
ABSTRACT: In August 2010, Dr. George Wilder from the Naples Botanical Garden in Naples, Florida, discovered red root floater (Phyllanthus fluitans) growing in a canal attached to the Peace River in Desoto County west of Fort Ogden, and reported his findings to the Florida Fish and Wildlife Conservation Commission (FWC). Since the initial discovery, FWC biologist Michael Sowinski, along with the Southwest Florida Water Management District (SWFWMD), found individual plants to large populations of the small floating plant scattered along roughly thirty-one river miles of the Peace River. Some highlights since the initial discovery will be presented along with an overview of this species.

FRIDAY, APRIL 6 – SESSION VII – ORAL PRESENTATIONS
Moderator: Greg MacDonald

COMMUNITIES COME TOGETHER TO REMOVE INVASIVE TREES: AN EXAMPLE OF COOPERATION, VOLUNTEERISM AND MULTIPLICATION

Ernie Franke, Chairman of Wetlands Committee, The Shores of Long Bayou Condominiums, 6301 Shoreline Drive, St Petersburg, FL, 727-393-8639, eafranke@tampabay.rr.com

BIO: Ernie Franke has a Master’s Degree in Electrical Engineering, where he had worked for 27 years. His current interest is restoring stormwater ponds, of which he has seven in progress, where he is the chairman of the Wetlands Committee at The Shores of Long Bayou Condominiums. The volunteers won Tampa Bay Estuary Program’s Golden Mangrove award for 2012 and 2015, recognizing the Tampa Bay Estuary Program's most outstanding Bay mini-grant project of the year. The volunteers also won a FLEPPC/FISP CISMA grant in 2016 and the FLEPPC Kathy Craddock Burks Education grant in 2017, and again in 2018.

ABSTRACT: Imagine several diverse groups coming together to fight for a common cause. It took seed money, scratching backs, and appealing to community pride to jointly battle the scourge of the Brazilian pepper (Schinus terebinthifolius), carrotwood (Cupaniopsis anacardoides) and jumbie bean (lead) tree (Leucaena leucocephala) at the Shores of Long Bayou Condominiums. Within their 77-acre campus, the Wetlands Committee turned an area overgrown with invasives, threatening their mangroves, into a charming picnic setting on the banks of Snowy Egret Lake. The Wetlands Committee of The Shores of Long Bayou Condominiums networked nine groups consisting of the; Tampa Bay Estuary Program (TBEP) mini-grant program, several condo communities, individual donors, volunteer workers, the Keep Pinellas Beautiful (KPB) Adopt-A-Shore program, professional tree-trimmers supplying excess mulch, and finally the FLEPPC Kathy Craddock Burks (KCB) Education grant meeting educational costs, to win the war in a seriously neglected area of their nature reserve.

INVASIVE PLANT MANAGEMENT IN NATURAL AREAS – MAINTENANCE INTERVAL PLANS

Greg MacDonald, Agronomy Department, University of Florida, Gainesville, 352-294-1594, pineacre@ufl.edu

BIO: Greg MacDonald is a professor of Weed Science/Agronomy and teaches undergraduate and several graduate weed science and crop production courses, including on-line distance education courses. He investigates the physiology, ecology and management of invasive species, focusing on perennial grasses – cogongrass in particular. He also conducts research on the physiological aspects of herbicides in aquatic systems and mechanisms of herbicide resistance in aquatic plants. In addition to research on invasive species, he is also involved in international development with USAID Peanut projects in Ghana and Haiti.

ABSTRACT: The Florida Fish and Wildlife Conservation Commission manage invasive species across a wide range of public lands, encompassing diverse ecosystems. The goal of invasive plant management is complete control/eradication of the nuisance species; however this is often not economically or logistically feasible for many species and situations. We developed a procedure that constitutes “maintenance control” which seeks to keep the population of invasive plants at the “lowest level feasible” to prevent damage to the natural environment. Initially we focused on annual and short-lived perennial grasses, but plan to expand more thoroughly with sedges/rushes, ferns, broadleaf forbs, and vines. For each species we: 1) determined threshold levels that would constitute control; 2) estimated the effectiveness of control methods and frequency to maintain thresholds; and 3)
currently developing a framework to construct integrated management plans/best management practices for multiple invasive species. We realize individual areas and managers must choose what species to focus efforts based on the desired outcome and long term impact and there is not one method that can be developed to address all questions and different approaches. The goal is to provide managers with the tools to develop more long-term, step-wise approaches to management, focusing not only on the elimination/maintenance of invasive species, but also integrating practices to allow for the transition/restoration of the system to provide the desired output that best fits the needs of their clientele.

**SPATIAL INVASIVE INFESTATION AND PRIORITY ANALYSIS (SIIPA) IN EDDMAPS**

Chuck Bargeron¹, Deb Stone², Becca VanKampen³, Karen Cummins⁴

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**BIO:** Chuck Bargeron is the Associate Director of the Invasive Species and Information Technology at the Center for Invasive Species & Ecosystem Health (Bugwood) and has a Public Service Faculty appointment split between the Warnell School of Forestry and Natural Resources and the Department of Entomology at the University of Georgia. He has been with the University of Georgia since 1999 where he has developed web applications, smartphone applications, interactive CD-ROMs, databases and outreach publications. Websites that Chuck has designed for the University of Georgia have been featured twice in Science Magazine, received regional awards for content and design, and have received over 1 billion hits in the last 10 years.

**ABSTRACT:** Invasive plants in Southeastern forestlands can greatly interfere with forest health, conservation and management goals. Invasive plants compete with and overwhelm native plant populations which can affect timber productivity, hydrology, wildlife, and prescribed burn plans on a forest. Treatment plans for invasive plants must be prioritized and strictly maintained for both short and long-term strategies. Prioritizing invasive plant treatments for private and government-owned lands is variable depending on data, tools and staffing. Developing a web-based decision support tool would help establish a systematic method on ranking invasive plant populations for treatment according to a land manager’s goals.

The Spatial Invasive Infestation and Priority Analysis (SIIPA) model was based off the prioritization system found in “The Nature Conservancy’s (TNC) Draft Weed Management Plan”, which uses four characteristics (Habitat Quality, Available Control Methods, Impacts of the species, and Extent). The SIIPA model was designed to apply a customized prioritization framework to all known invasives within an area of interest, allowing the manager to prioritize not just different species, but individual populations within a species and across different species. The original model works with ESRI’s ArcGIS software, but has been adapted to work in a web map application to increase availability to a wider audience.

The Spatial Invasive Infestation and Priority Analysis (SIIPA) tool’s web map version is designed to use data from the Early Detection Distribution and Mapping System (EDDMapS) and apply a prioritization framework to the data, with the goal of assisting property owners, land managers and project managers with designing a treatment plan for their invasive plant populations. The web map version uses the main four characteristics but still allows for customization in how those characteristics are prioritized. The SIIPA web map version will provide land managers with an adaptable, easy-to-use decision support tool for making critical prioritization choices.

**EXPECTED IMPACT AND MASS PRODUCTION OF THE THRIPS BIOLOGICAL CONTROL AGENT OF BRAZILIAN PEPPERTREE**

Dale A. Halbritter¹, Emily E. Jones¹,², Evan J. Broggi¹, and Gregory S. Wheeler¹

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BIO: Dale Halbritter is a post-doctoral research entomologist at the USDA/ARS Invasive Plant Research Laboratory. He is working with Dr. Greg Wheeler on ways to maximize thrips production in preparation for a mass rearing program. Dale has experience with biogeography, chemical ecology, and thermal physiology from his Ph.D. in entomology, as well as years of experience conducting field work and rearing insects.

ABSTRACT: The thrips *Pseudophilothrips ichini* Hood has great potential as a biological control agent of Brazilian peppertree, *Schinus terebinthifolia* Raddi. Nearing the end of several years of overseas field work and host specificity testing in quarantine, research is shifting towards preparation for agent evaluation, mass rearing, and field release. Providing quality host plant material is essential to insect production and colony viability. We investigated the effects of fertilized plants on thrips production and thrips-inflicted plant damage. Brazilian peppertree seedlings were grown in 3.8-L pots and fertilized bi-weekly (24N-8P-16K) at one of three concentrations: low (0 g/L water), medium (1.8 g/L water), or high (3.6 g/L water). The medium-fertilized plants yielded the greatest number of thrips. All plants were initially infested with 20 adult thrips, and feeding damage was quantified for one or two generations. Fertilizer concentration affected all plant variables used as indicators of damage. Plant height, number of branches, leaves and leaflets, and actively growing branch tips decreased after one or two generations of thrips. Results indicate medium-fertilized plants would maximize mass production of thrips in captivity. Fertilized nursery plots may improve the establishment of the thrips in the field by sustaining reliable source populations of thrips. Additionally, ensuring the persistence of multiple generations of thrips in the field will reduce the total growth and biomass of Brazilian peppertree seedlings.
ABSTRACTS – POSTER PRESENTATIONS

(in alphabetical order)

CHINESE TALLOW TREE (*TRIADICA SEBIFERA*) MANAGEMENT AND SEED BIOLOGY (STUDENT POSTER)

Leah Aidif¹, Heather VanHeuveln¹, Candice Prince², Greg MacDonald¹
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BIO: Leah Aidif is a recent graduate from the College of Agriculture and Life Sciences at the University of Florida. She is planning to pursue a master’s degree studying invasive plant biology.

ABSTRACT: Chinese tallow tree (*Triadica sebifera*) is an invasive tree species present throughout the southeastern United States. Chinese tallow tree has proven to be difficult to manage due to its aggressive growth and prolific seed production. Chinese tallow tree seedling emergence and seed bank longevity was monitored at 2 sites (Gainesville, FL and Jay, FL) to provide a better understanding of long-term impacts. Covered frames (1 m²) were placed in areas invaded by Chinese tallow. Seedling emergence was monitored on a monthly basis for a period of three years, after which the soil underneath the frames was excavated and sifted to collect seeds still present in the seed bank. Seeds were planted in the greenhouse and germination was recorded over a 60 day period. The seeds that did not germinate in the greenhouse went through viability testing using tetrazolium (1% solution). Seedling emergence in the field occurred over a 2-3 month period during spring and varied regionally. A period of dormancy was observed between growing seasons as well as a significant decline in seedling emergence in the second growing season indicating a possible seed bank longevity of 2-3 years. There was limited germination or viability in the seeds collected from the field, further supporting the conclusion that seeds were no longer viable after three years in an undisturbed natural setting.

EVALUATIONS OF NEW TOOLS AND TECHNIQUES TO CONTROL BRAZILIAN PEPPER (*SCHINUS TEREBINTHIFOLIUS RADDI*) AND TO REDUCE HERBICIDE USE ON DOD MILITARY INSTALLATIONS IN FLORIDA (STUDENT POSTER)

Mackenzie Bell, Agronomy Department, University of Florida, Gainesville, Florida, 760-485-4512, Me.bell@ufl.edu

BIO: Mackenzie Bell is a graduate assistant for Dr. Enloe in the Agronomy Department at the University of Florida. The year prior to starting her Master’s degree, she was a Florida Conservation Corps member within AmeriCorps working in the field removing invasive plants from Florida State Parks. This experience left her with a firsthand understanding of the significance invasive plants have on Florida’s natural areas. Her research focuses on invasive plant management with emphasis on testing new methods of treating Brazilian Pepper for reduced herbicide active ingredient and increased applicator safety and efficacy.

ABSTRACT: Brazilian Pepper (*Schinus terebinthifolius Raddi*) is one of the most invasive trees in Florida. This species transforms ecosystems by shading out native species and forming dense monotypic stands. Since introduction to Florida in the early 1900s, Brazilian pepper has invaded multiple sensitive habitats including mangrove forests, coastal dune communities, and critical scrub jay habitat along the east coast of Florida. Brazilian pepper also persists in salt spray environments along coastal dunes, vigorously resprouts from mechanical cutting, and rapidly recovers from hurricane damage. Cape Canaveral Air Force Base serves as a unique refuge to many native flora and fauna species; however, Brazilian pepper poses a significant threat to this biologically diverse habitat and the native imperiled species it hosts. Managing invasive plants can be costly, therefore it is important for land managers to be educated in the safest and most effective ways of treating this tree. Recent research has found that a modified hack and squirt technique may be a game changer for Brazilian pepper control. With this in mind, several newer herbicides labeled for terrestrial or aquatic uses warrant testing
including aminopyralid (Milestone), aminocyclopyrachor (Method), imazamox (Clearcast), and a new triclopyr acid formulation (Trycera). My specific aim is to test new treatment types that reduce the herbicide active ingredient against commercial standard treatments. Additionally, I will take into account practicality, safety, and efficiency for contractors. This will hopefully yield results prompting land managers to achieve greater success in managing Brazilian pepper.

**EFFICACY OF GRAMINICIDES ON WEST INDIAN MARSH GRASS (*HYMENACHNE AMPLEXICAULIS*) AND NON-TARGET EFFECTS (STUDENT POSTER)**

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**BIO**: Kaitlyn is a graduate research assistant in Interdisciplinary Ecology in the School of Natural Resources at the University of Florida. Her research examines non-target effects of graminicides and graminicide control of *Hymenachne amplexicaulis*, as well as its germination and seed storage characteristics.

**ABSTRACT**: *Hymenachne amplexicaulis*, or West Indian marsh grass (WIMG), is a non-native invasive grass rapidly colonizing Florida’s freshwater systems. Originally introduced as a potential forage species, WIMG tolerates a wide range of environments from drought-like to flooded conditions. This highly competitive, perennial species outcompetes native vegetation forming dense monocultures. The selective graminicides sethoxydim and fluazifop-p-butyl are currently being assessed for use in aquatic systems for invasive grass control. Although these chemistries are promising for invasive grass control, they do not differentiate between invasive and native grasses such as *Leersia oryzoides*, *Luziola fluitans*, or *Paspalum distichum*. A study was conducted in Cypress Lake in Osceola County, FL to assess WIMG control using two rates of fluazifop and one rate of sethoxydim and to assess non-target effects on native species including native grasses. Twenty-eight 30x200ft plots were established on November 8, 2017. Sixteen plots were established in an area of high plant diversity and the remaining twelve were established in WIMG-dominated areas. Baseline percent cover data for each species and water depth was collected in five quadrats along a central transect in each plot. On November 20, the WIMG-dominated plots were treated in a completely randomized design (CRD) with fluazifop at 24 and 48 oz/A and sethoxydim at 3% v/v. An untreated control was also included. On December 1, 2017, the high plant diversity plots were treated in a CRD with the same treatments. Subsequent percent cover and water depth data was collected 30 and 90 DAT. Preliminary analysis indicates both graminicides can provide initial selective control of WIMG. Longer-term evaluations will be conducted to better understand how these graminicides may fit into a WIMG management plan.

**CONTROL OF KALANCHOE SPECIES IN FLORIDA BEACH DUNE COMMUNITIES (STUDENT POSTER)**

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**BIO**: Jessica Solomon is a Masters Student in the Agronomy Department at the University of Florida. Her research interests focus on invasive plant management practices, specifically on reducing herbicide in the field, while increasing application efficacy and application ease.

**ABSTRACT**: Kalanchoe is a genus of succulent plants believed to be native to Madagascar. It was introduced into Florida very early for ornamental and medicinal uses. There are currently two species of Kalanchoe (*Kalanchoe pinnata* and *Kalanchoe x houghtonii*) listed on the Florida Exotic Pest Plant Council’s Invasive Plant List, as well as 5 other species of *Kalanchoe* that have been voucheded from the state of Florida. *Kalanchoe* has invaded many beach dune ecosystems, especially along the east coast of Florida. *K. pinnata* has a common name of Mother of Thousands, after its ability to produce numerous plantlets through epiphyllous buds. However, this ability to spread vegetatively is shared among all species in the *Kalanchoe* genus. *K. pinnata* is considered a
noxious weed in multiple parts of Australia, Cuba, and Ecuador. Very minimal research has been done on the management of this invasive plant, specifically in the unique beach dune ecosystems that make up the majority of Florida’s coastline. There are many unanswered questions regarding Kalanchoe biology, ecology, and management that need to be addressed in Florida. This poster will focus on proposed Master’s research involving greenhouse and field studies to examine Kalanchoe biology and management to assist land managers in protecting beach dune ecosystems in Florida.
Andrew Lawrence is a Biologist for the Florida Fish and Wildlife Conservation Commission’s Invasive Plant Management section. He received a bachelor’s degree from the University of Central Florida in Environmental studies. After graduation he has worked in the private sector specializing in ecosystem restoration and volunteered with Seminole County Natural Lands and Back to Nature Wildlife refuge. Andy is currently focused on upland invasive plant management. Andrew.Lawrence@MyFWC.com

Sarah Martin works as the South Florida Land Conservation Coordinator for the Florida Chapter of The Nature Conservancy’s South Florida Program. Growing up in Arizona and southern New Jersey, Sarah developed a conservation ethic and love for nature early. As a child she spent much of her time hiking, camping and exploring the vast desert landscapes of the Southwest and the coastal wilderness areas of the great Mid-Atlantic. Sarah completed undergraduate studies in Washington State at Seattle University, where she received her Bachelor’s degree in Environmental Studies and French and completed independent studies abroad in Belize and France. After graduation, Sarah completed an internship and further graduate studies in Landscape Architecture and Regional Planning, working with the natural areas of the University of Pennsylvania’s Morris Arboretum. Sarah came to Florida in 2008 to work with The Nature Conservancy as a restoration technician on the South Florida landscape. She then worked as a resource management intern with AmeriCorps for the Florida State Parks in South Florida. Sarah spent five years working in Miami, Florida as a biologist and coordinator for The Institute For Regional Conservation’s Pine Rockland Initiative program. She returned to The Nature Conservancy in 2014. Sarah.Martin@TNC.org

Deb Stone moved to the St. Johns River Water Management District in 2014 as the Invasive Plant Program Supervisor, where her focus is on invasive species prioritization, restoration and GIS technologies. She graduated from USF with a B.S. in Biology in 2004, then began working as the Rare Plant Intern at Bok Tower Gardens, where her passion for all things botanical began to blossom. She then moved to Hillsborough County’s Environmental Lands program in 2006, working on invasive plant control, monitoring and prescribed fire. Deb started as the Restoration Steward for The Nature Conservancy at The Disney Wilderness Preserve in 2008, where she focused on invasive species prioritization, GIS technologies, working with local Cooperative Invasive Species Management Areas, ground cover restoration and vegetation monitoring. She recently finished her M.S. in Forest Resources and Conservation at the University of Florida and is pursuing her Ph.D. in the same program. Go Gators! DStone@SJRWMD.com

Melissa C. Smith, PhD, is a research ecologist with the Invasive Plant Research Laboratory at the USDA-ARS Invasive Plant Research Lab in Fort Lauderdale. Dr. Smith is a graduate of Willamette University in Salem, Oregon (Biology) and Washington State University in Pullman, Washington (Botany), where she completed her dissertation looking at ways to predict plant invasions through physiological responses. Melissa started her work with Florida ecosystems in the immediate aftermath of Hurricane Wilma when she was an education and interpretation ranger in Everglades National Park. Returning to Florida to build a career looking for long term solutions to large-scale plant invasions is the culmination of many years of hard work and fortunate circumstances. Melissa joined the Invasive Plant Research Laboratory as a post-doctoral researcher in 2012 and she currently explores ways to integrate biological control into invasive plant management strategies with particular focus on Melaleuca quinquenervia, Rhodomyrtus tomentosa and Acacia auriculiformis. Melissa is a forming member of the Biology Graduate Student Association at Washington State University and served as a graduate senator for four years. Melissa.Smith@ARS.USDA.gov
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