Invasion of the **Habitat Snatchers**
Wildlife Invades!

Florida Chapter of The Wildlife Society | Florida Exotic Pest Plant Council
Joint 2012 Spring Conference
Florida Power & Light is proud to sponsor the
The Florida Chapter of the Wildlife Society
and Florida Exotic Pest Plant Council
2012 Spring Conference

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Welcome to Florida Chapter of The Wildlife Society (FLTWS) and the Florida Exotic Pest Plant Council (FLEPPC) joint 2012 Spring Conference. This event marks the first time that FLEPPC and FLTWS have teamed up to coordinate our annual meetings, and we are optimistic that this opportunity will help our collective members more effectively meet the challenges that natural areas managers in our state face.

Our organizations represent very different taxonomic entities and management objectives, but our overall conservation missions are similar: the protection and conservation of natural areas with native plants and animals. This meeting provides an opportunity for us to exchange information about conservation and resource stewardship that will broaden our collective knowledge base and improve our ability to manage Florida’s natural areas.

We hope you will take advantage of the main asset of the FLTWS and FLEPPC partnership, its people. It is no secret that the value of professional meetings often comes from informal interactions. If fostered, these interactions can turn into productive professional relationships and lasting personal friendships. Managers are increasingly drawing on well-functioning teams of people with a variety of expertise to solve difficult environmental problems. Why not build the foundation for those professional teams at the conference? We encourage you to:

- Engage other professionals in discussion
- Participate in ongoing scientific dialog that permeates the meeting
- Enjoy the attractive and informative poster session
- Mentor students or entry-level professionals attending the conference
- Meet new people and broaden professional contacts
- Renew acquaintances with colleagues.

Thanks for participating, and have a great symposium.

Dale E. Gawlik, President, Florida Chapter of the Wildlife Society
James N. Burch, Chair, Florida Exotic Pest Plant Council
Florida Chapter of The Wildlife Society 2011-2013

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Nominating and Elections: Steve Rockwood
Program: Stefanie Nagid
Scholarship: Holly Ober
Website: Patrick Delaney

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Student Paper Judging: Becky Bolt, Sherry Williams
Poster Session: Eric Tillman
Continuing Education Units: Ben Gugliotti
Audio/Visual: Mike Milleson
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Photography: Jodie Gless

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Vendor: Bill Kline
Website: Chuck Bargeron
NA-EPPC Representative: Matthew King
SE-EPPC Representative: Karen Brown
Workshops

Tuesday, April 17, 2012 – Pimlico Room

How to Sustain a Cooperative Invasive Species Management Area
Kristina Serbesoff-King and Erin Myers
Facilitated by Joanna Webb, National Friends and Partnership Coordinator for the US National Wildlife Refuge System

This workshop is focused on sustaining long term Cooperative Invasive Species Management Areas (CISMAs) in order to facilitate effective management of invasive species that threaten Florida’s wildlife habitats, working lands, natural communities and biodiversity. The more specific focus of this workshop will be developing 1) guiding principles for the roles and responsibilities within the CISMA and 2) guidelines for using the CISMA structure to successfully plan and implement a CISMA workday. To sustain individual CISMAs in Florida over the long-term, clear expectations of the roles of the different positions as well as the general membership need to be developed. Having a clear set of guiding principles will set realistic expectations and generate additional capacity. Additionally, using this workshop as a platform to develop workday guidelines will take advantage of the network of CISMAs that will be present, allowing each to share ideas and learn from peers.

Tuesday, April 17, 2012 – Keeneland/Aqueduct Rooms

General Pesticide License Certification Standards and Test
Ken Gioeli, Extension Agent, IFAS St. Lucie County Extension Office

General Pesticide Certification Standards Training (2 hours)
This portion of the workshop addresses topics such as:

- Pesticide Laws, Rules and Regulations
- Record Keeping
- Pesticide Labels
- Harmful Effects of Handling Pesticides
- Personal Protective Equipment
- Pests and Pest Control
- Pesticide Formulations and Application
- Equipment Transportation, Storage, Disposal, and Spill Clean-up

Natural Areas Weed Management Pesticide License Exam Prep (2 hours)
This portion of the workshop addresses natural areas weed identification, pesticide management reading and understanding a natural areas weed management pesticide label. It also includes reviewing pesticide label arithmetic problems for natural areas weed managers and pesticide chemical properties.
Field Trips

Wednesday, April 18, 2012 - 12:00PM - 5:00PM

National Wildlife Research Center Field Trip
The Gainesville facility was built in 1963 and has served as a bird and mammal research field station ever since. The 26-acre site is located three miles east of the University of Florida. There is a main building holding offices and laboratories, and three roofed outdoor aviaries for maintaining and testing wild birds. In addition, there are eight 10 x 30 foot enclosures and two half-acre flight pens where various trials can be conducted throughout the year under natural environmental conditions.

Primary research emphasis is on identifying, evaluating, and developing methods to manage depredation, nuisance, and property damage problems associated with native birds such as vultures and crows, and non-native species such as feral pigs, Burmese pythons, black spiny-tailed iguanas, monk parakeets, and other invasive species. To do this, scientists conduct behavioral and physiological studies with captive wild animals at the Florida field station and carry out field trials in Florida, Virginia, Pennsylvania, South Carolina, and elsewhere. Research is conducted with the cooperation and support of Wildlife Services Operations, community organizations, private companies, and state and federal agencies. During the tour, constrictor identification and handling techniques will be conducted.

Silver River State Park Canoe Field Trip
Silver River State Park is significant due to Silver Springs, one of Florida's largest first magnitude springs and one of the largest limestone springs in the world. Silver Springs has also served as the center of one of Florida's most popular privately operated tourist attractions for over one hundred years. The uplands surrounding the Silver River contain a striking diversity of highly significant archaeological sites that represent periods of Florida's history from the Paleo-Indian to the Seminole War era. Park lands support a significant population of Florida pinkroot (Spigelia loganioides), an endangered plant species and provide important habitat for a variety of other imperiled plants and animals including Florida gopher tortoise (Gopherus polyphemus), Florida black bear (Ursus americanus floridanus), silver buckthorn (Sideroxylon alachuense) and Godfrey's swamp privet (Forestiera godfreyi).

The canoe trip will start downstream in the park and make its way to the head springs. Along the way participants will see plenty of wildlife, many other springs that flow into the river and will discuss some of the invasive species issues in this area, both plant and animal invaders.
Silver River State Park FLEPPC Demonstration Site Field Trip
Silver River State Park is home to 14 unique plant communities, more than 20 archeological sites, numerous imperiled plant and animal species, and, unfortunately, at least 12 FLEPPC Category 1 invasive plant species. Park managers continue an active exotic plant management program aimed at reaching their goal of long-term maintenance control of priority invasive plants in the park. During this field trip, park staff will provide a tour of the park including visits to current treatment areas focused on cogongrass and camphor tree. In addition, participants will view a FLEPPC Control and Evaluation Committee demonstration plot, which compares cogongrass control using different adjuvants with glyphosate.

Juniper Springs Field Trip
This field trip will visit the Ocala National Forest’s creeping fig invasive control project. The project has important repercussions regarding timing of treatments with recreational activity slumps, coordinating with multiple entities, use of interpretation and outreach, use of partners, and developing novel strategies.

Cross Florida Greenway Field Trip
The Cross Florida Greenway is approximately 94,000 acres which extend from the Gulf of Mexico near Inglis to the St. Johns River just south of Palatka. The Crown Jewel of the Greenway is the remaining, intact portion of the Ocklawaha River that was spared from construction and channelization during the building of the Cross Florida Barge Canal in the ‘60’s. This field trip will begin with an overview of the Cross Florida Barge Canal and how it became the cross Florida Greenway along with an overview of the invasive plant management program that has been taking place on the Greenway since 1999.
The Greenway is home to 36 Category I and II invasive plants found in multiple infestations. Following the brief presentation, participants will board several jon-boats and navigate approximately 4 miles downstream to Butterbust Landing. This 4 mile stretch is lined with floodplain swamp. Participants will visit former coral ardisia and camphor infestations. These infestations have been treated with funding from FWC’s Invasive Plant Management section. Participants will also discuss the operational/contractual challenges of treating sites along the river with little to no upland access.
In order to receive CEUs during the FLEPPC Symposium you must do the following:

1. Attend Symposium Sessions that have been approved for CEUs.
2. Sign in at the beginning of each session. This means before the speaker begins speaking. You may have to arrive a few minutes early in order to not interrupt the speaker. Please be courteous.
3. Stay in the room throughout the session. While we highly recommend visiting our vendors and sponsors, please do not do this while you are trying to earn CEUs.
4. At the end of each session, check out with the CEU provider at the back of the room and pick up your CEU sheets. Do not leave and then come back later and say that you forgot to pick up your sheet. We will be forced to conclude that you left early and were not present when everyone else in the session picked up their CEU sheet.
5. Do not argue with the CEU provider!

**FLTWS-FLEPPC 2012 Spring Conference Available CEUs**

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<th>Forest Pests</th>
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<th>Right-of-way</th>
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<th>Ornamental &amp; Turf</th>
<th>Demo &amp; Research</th>
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The symposium has a maximum number of 18.5 CEUs available; however, an attendee can earn a maximum of 12 CEUs since they cannot attend all of the workshops and field trips simultaneously.
Monday, April 16, 2012
10:00am-6:00pm: Registration and Vendor/Poster Setup
9:00am-12:00pm: FLEPPC Board and Task Force Meeting (Keeneland/Aqueduct Room)
12:00pm-1:00pm: Lunch (on your own)
1:00pm-3:30pm: Symposium: Invasive Wildlife (Arlington/Monmouth/Laurel Rooms)
3:30pm-3:50pm: Break
3:50pm-5:50pm: FLTWS Business Meeting (Arlington/Monmouth/Laurel Rooms)
   Guest Speaker: Darren Miller, The Wildlife Society: Background and Activities
6:00pm-9:00pm: Welcome Social (poolside)

Tuesday, April 17, 2012
8:00am-5:00pm: Registration and Vendor/Poster Setup
8:30am-9:00am: Welcome Addresses (Arlington/Monmouth/Laurel Rooms)
9:00am-11:00am: Plenary Session (Arlington/Monmouth/Laurel Rooms)
11:00am-12:30am: Lunch (on your own)
12:30pm-3:30pm: CISMA Workshop (Pimlico Room)
12:30pm-6:30pm: General Pesticide License Certification Standards/Test (Keeneland/Aqueduct Room)
12:30pm-2:30pm: Technical Session (Arlington/Monmouth/Laurel Rooms)
2:30pm-2:50pm: Break
2:50pm-4:50pm: Technical Session (Arlington/Monmouth/Laurel Rooms)
4:30pm-5:30pm: Invasive Plant Management Association Meeting (Pimlico Room)
6:00pm-10:00pm: Beast Feast/Concert (poolside)

Wednesday, April 18, 2012
8:00am-5:00pm: Registration and Vendor/Poster Setup
8:30am-10:10am: Student Technical Session (Arlington/Monmouth/Laurel Rooms)
10:10am-10:30am: Break
10:30am-11:50am: Student and Technical Session (Arlington/Monmouth/Laurel Rooms)
12:00pm: Lunch (boxed lunch provided)
12:00pm-5:00pm: Field Trips
6:00pm-7:00pm: Poster Session and UF Alumni and Friends Reception (Santa Anita/Del Mar Rooms)
7:00pm-9:00pm: Banquet Dinner and Awards Ceremony (Arlington/Monmouth/Laurel Rooms)

Thursday, April 19, 2012
8:30am-10:00am: FLEPPC Business Meeting (Arlington/Monmouth/Laurel Rooms)
10:00am-10:20am: Break
10:20am-11:50am: Technical Session (Arlington/Monmouth/Laurel Rooms)
12:00pm-1:30pm: Lunch (on your own)
1:30pm-3:10pm: Technical Session (Arlington/Monmouth/Laurel Rooms)
3:10pm-3:30pm: Farewell Address (Arlington/Monmouth/Laurel Rooms)
Invasive Wildlife  
Monday, April 16, 2012 | 1:00 pm – 3:30 pm

1:00 pm – 1:10 pm  Welcome and Introductions – Erin Myers – President Elect, Florida Chapter of The Wildlife Society
3:10 pm – 3:30 pm  Panel Discussion

MANAGEMENT OF EXOTIC WILDLIFE OF FLORIDA  
1:10 pm – 1:30 pm | Jenny Novak – Florida Fish and Wildlife Conservation Commission

Jenny Novak is the Exotic Species Special Projects Leader in the Exotic Species Coordination Section of the Florida Fish and Wildlife Conservation Commission. She currently coordinates the Exotic Pet Amnesty Program, oversees permits for conditional and prohibited species, manages the nonnatives portion of the FWC web site, leads the agency’s lionfish team, and manages the Burmese python removal program. She joined the FWC in 1999 as the conservation education biologist for southwest Florida. In 2003 she relocated to Tallahassee as the field biologist at Aucilla Wildlife Management Area, and joined the Exotics Species Section in 2006. Originally from North Carolina, she has a B.S. from Appalachian State University and an M.S. from Auburn University. In her spare time she teaches as an adjunct faculty member at Tallahassee Community College.

RESPONSE TO EVIDENCE OF BREEDING POPULATIONS OF NILE MONITORS AND OUSTALET’S CHAMELEONS IN SOUTH FLOIDA  
1:30 pm – 1:50 pm | Jenny Ketterlin-Eckles – Florida Fish and Wildlife Conservation Commission

Jenny Ketterlin Eckles is a wildlife biologist with the Florida Fish and Wildlife Conservation Commission. She has worked for FWC since March 2004, first in the state-managed Everglades and now as the non-native wildlife biologist for South Florida in the Exotic Species Coordination Section. The ESC’s mission is to minimize adverse environmental, economic, and human health and safety impacts of introduced wildlife. In South Florida Jenny is involved in management activities for Gambian pouched rats, Northern African pythons, Burmese pythons, Nile monitors, and purple swamphens, to name a few. Jenny is a candidate for a master’s thesis in Interdisciplinary Ecology with the University of Florida. She graduated from the University of Colorado at Boulder in May 2000 and began her wildlife career in stream ecology with the Colorado Division of Wildlife.

THE TROUBLE WITH TEGUS: EVERGLADES COOPERATIVE INVASIVE SPECIES MANAGEMENT AREA’S EARLY DETECTION AND RAPID RESPONSE TO TUPINAMBIS MERIANAE IN MIAMI-DADE COUNTY  
1:50 pm – 2:10 pm | Tony Pernas – National Park Service

Tony Pernas is the coordinator for the National Park Service's Florida and Caribbean Exotic Plant Management Team. Tony has 25 years of professional invasive species management experience having previously served as Resource Management Specialist for Big Cypress National Preserve and as Supervisory Botanist for Everglades National Park. Tony currently serves as Co-Chair of the Everglades Cooperative Invasive Species Management Area.

AN INTERGRATED EARLY DETECTION, RAPID RESPONSE AND MONITORING PROGRAM FOR EVERGLADES INVASIVE REPTILES AND AMPHIBIANS  
2:10 pm – 2:30 pm | Frank Mazzotti – University of Florida Research Institute

Frank J Mazzotti is a professor of wildlife ecology with a research/extension appointment at the University of Florida. His areas of expertise are conservation and landscape ecology, endangered and invasive species, and environmental education. Current research and extension efforts focus on ecosystem conservation and management in South Florida and the Caribbean. South Florida programs include monitoring ecological responses of alligators and crocodiles to Everglades ecosystem restoration efforts and evaluating and assessing risks and impacts of invasive species and climate change. Caribbean programs focus on conservation ecology of crocodiles in Belize and Jamaica and a community conservation program for fields in Belize.
Dr. Steve A. Johnson is an Associate Professor of Wildlife Ecology at the University of Florida in Gainesville where he holds a 60% teaching and 40% extension position. His tenure home is the Department of Wildlife Ecology and Conservation. He teaches wildlife ecology courses that support Bachelor of Science degrees for the Wildlife Ecology and Natural Resource Conservation majors. Dr. Johnson’s area of expertise is natural history and conservation of amphibians and reptiles. His current extension and research programs emphasize invasive wildlife biology, venomous snake identification and safety, and urban wildlife education. He holds a Ph.D. from the University of Florida and BS and MS degrees from the University of Central Florida. Steve is a native Floridian, enjoys being outdoors, and is a beer snob.

“ED” AND INVASIVE REPTILES IN FLORIDA
2:30 pm – 2:50 pm | Steve Johnson – University of Florida, Wildlife Ecology and Conservation Department

Cheryl Millett is a Biologist at The Nature Conservancy and leads Python Patrol, the Central Florida Lygodium Strategy, and the Heartland CISMA. Python Patrol is a program to provide containment and early detection and rapid response of invasive exotic Burmese pythons, and other invasive species in south and central Florida, by training detectors to accurately identify and report them, training responders to safely capture them, and providing a hotline to link the two. The Central Florida Lygodium Strategy is a partnership to apply a regional approach to stopping the northern spread of Old World climbing fern on public and private lands. The Heartland CISMA is a partnership to regionally focus efforts to deal with invasive species. Cheryl also coordinated Jay Watch, a citizen science program monitoring the federally threatened Florida scrub-jay, which is now a project of Florida Audubon.

PYTHON PATROL: THE CHALLENGE OF RAPID RESPONSE TO INVASIVES THAT DON’T STAY PUT
2:50 pm – 3:10 pm | Cheryl Millett – The Nature Conservancy

Florida Chapter of The Wildlife Society Business Meeting
Arlington | Monmouth | Laurel Rooms
Monday, April 16, 2012 | 3:50 pm – 5:50 pm | Guest Speaker

GUEST SPEAKER
THE WILDLIFE SOCIETY: BACKGROUND AND ACTIVITIES
3:50 pm – 4:20 | Darren Miller – Past-President, Southeastern Section of The Wildlife Society

Darren Miller is a Certified Wildlife Biologist® and Senior Scientist. He manages Weyerhaeuser’s Southern Environmental Research Program and leads the Catchlight Energy Scalability and Sustainability research platforms. He received a B.S. in Wildlife Management from Eastern Kentucky University (1991), an M.S. in Wildlife Ecology (1993) and a Ph.D. in Forest Resources (1997) from Mississippi State University. Dr. Miller is the Past-President of the Southeastern Bat Diversity Network and the Southeastern Section of The Wildlife Society. He is currently the Southeastern Section Representative to the governing Council of The Wildlife Society. Dr. Miller has nearly 70 peer-reviewed publications on a wide diversity of topics and taxa. He is also adjunct faculty at 4 universities.
Invasion of the Habitat Snatchers: Wildlife Invades – Invasive Species Policy
Tuesday, April 17, 2012 | 8:30 am – 11:00 am

8:30 am – 9:00 am Welcome Addresses from Jim Burch, Florida Exotic Pest Plant Council Chair, and Dale Gawlik, Florida Chapter of The Wildlife Society President

NEW DEVELOPMENTS IN FEDERAL POLICY FOR INVASIVE ANIMALS AND PLANTS
9:00 am – 9:25 am | Peter T. Jenkins – Center for Invasive Species Prevention

Peter Jenkins is an experienced environmental advocate working over the last 12 years for major non-profit organizations in Washington, DC. Since 2011, Mr. Jenkins has been self-employed as a consultant on contract with Great Lakes United and on behalf of the National Environmental Coalition on Invasive Species (NEGIS). Working through his consulting entity, the Center for Invasive Species Prevention, he is the NECIS policy lead on campaigns in directed at Congress and the Administration seeking to modernize U.S. animal import laws. He also was a contracted consultant to the National Association of Exotic Pest Plant Councils, advising them on Federal plant import regulation. He is now working on the issue of Colony Collapse Disorder in honey bees for a coalition organized through the Center for Food Safety.

Mr. Jenkins earned a law degree (University of Puget Sound, 1983) and a Masters in Environmental Studies (Yale School of Forestry and Environmental Studies, 1990). He has more than 20 years’ experience in a broad range of environmental work as an attorney, policy analyst, consultant, advocate and manager.

Policy issues related to invasive species has been a major theme of Mr. Jenkins’ career since his first Washington job, from 1990 to 1992 as Attorney/Policy Analyst on the U.S. Congress, Office of Technology Assessment report, Harmful Non-Indigenous Species in the United States. He was a co-founder of NECIS, a planning team member for the Global Invasive Species Programme and an original member of the IUCN Invasive Species Specialist Group. He is a member of the Society for Conservation Biology and is the co-chair of its Biosecurity Task Force, which addresses threats of invasive species and other trade-connected issues.

LIVE VERTEBRATE TRADE: HISTORY AND IMPLICATIONS FOR POLICY AND MANAGEMENT OF NONINDIGENOUS SPECIES
9:25 am – 9:45 am | Christina M. Romagosa – Auburn University, School of Forestry and Wildlife Sciences

Christina Romagosa is a Research Fellow in the School of Forestry and Wildlife Sciences at Auburn University. She has an MS in Wildlife Ecology and Conservation from the University of Florida, and a PhD in Biology from Auburn University. Her research focus is on biological invasions and the human contribution through trade to this process; and subsequent impacts on wildlife communities and human populations. She has assembled and managed a dataset of US Fish and Wildlife Service importation and exportation records that span a 30 year time period and consist of more than 4000 vertebrate species. These data have been linked to current lists of globally threatened and nonindigenous species, as well as to economic and life history information. Her compilation of these data has been used by government agencies, NGOs, in congressional testimonies, as well as for academic research. Currently, she is also participating in the multi-agency efforts to manage nonindigenous pythons in southern Florida.
INCLUSION OF THE AUSTRALIAN WEED RISK ASSESSMENT SYSTEM INTO THE USDA PLANT RISK ASSESSMENT PROCESS
9:45 am – 10:05 am  |  Doria Gordon – The Nature Conservancy

Doria Gordon has worked for the Florida Chapter of The Nature Conservancy since 1990. She is currently the Director of Conservation, leading the Conservancy's conservation and science staff who are implementing innovative projects to protect, manage and restore ecosystems throughout Florida. Dr. Gordon is also a Courtesy Professor of Biology at the University of Florida. Her research focus includes identification and prediction of invasive non-indigenous plant species, modeling the effects of sea level rise on coastal habitats, process and species restoration in longleaf pine ecosystems, and rare species biology, demography, and management. Dr. Gordon completed a M.S. and Ph.D. in Ecology at the University of California at Davis.

NEW FOREST SERVICE INVASIVE SPECIES MANAGEMENT POLICY: OVERVIEW AND NEXT STEPS
10:05 am – 10:25 am  |  Jason Drake – National Forests in Florida, Ecosystem Management

Jason Drake earned a B.S. in Zoology from Mars Hill College in North Carolina, a M.S. in Biology from the University of Central Florida and a Ph.D. in Geography from the University of Maryland. In 2006 he joined the Ecosystem Management staff of the National Forests in Florida Supervisor's Office in Tallahassee as a Geospatial Program Manager. Since the fall of 2011 he has also been the Acting Forest Ecologist for the National Forests in Florida. Over the past few years he has helped to develop Ecological Condition Models to assess the current conditions of the forest in relation to Desired Future Conditions. He has also helped to create Management Prioritization Models to help prioritize treatments such as prescribed fire, mechanical fuels reduction and timber thinning.

HISTORICAL AND ECOLOGICAL CONSIDERATIONS FOR NON-NATIVE SPECIES POLICY AND MANAGEMENT IN FLORIDA
10:25 am – 10:45 am  |  Scott Hardin – Florida Fish and Wildlife Conservation Commission

Scott Hardin directs the Florida Fish and Wildlife Conservation Commission’s Exotic Species Coordination Section, which works within the agency and with other state, local and federal agencies to prevent introductions of non-native species, and to minimize impacts of prior introductions. He represents FWC on the Gulf and South Atlantic Regional Panel for Aquatic Invasive Species, and chairs the Aquatic Nuisance Species Committee of the Southeastern Association of Fish and Wildlife Agencies. He has been involved in development of regulations and outreach programs to reduce the risk of non-native species introductions; has directed and conducted non-native species eradication projects; and has conducted risk analyses of aquatic organisms in Florida.
Technical Session I – Arlington/Monmouth/Laurel Rooms
Tuesday, April 17, 2012, 12:30 pm – 4:50 pm

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Presenter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:30 pm – 12:50 pm</td>
<td>Coyotes in Florida – The Good, The Bad, and The Ugly.</td>
<td>M. Main</td>
</tr>
<tr>
<td>12:50 pm – 1:10 pm</td>
<td>Feral hog management within Florida State Parks.</td>
<td>P. E. Small</td>
</tr>
<tr>
<td>1:10 pm – 1:30 pm</td>
<td>Assessing feral swine damage to sensitive plant communities at Avon Park Air Force Range, FL.</td>
<td>R. K. Felix, Jr., E. A. Tillman, M. L. Avery, R. M. Engeman, and G. Killian</td>
</tr>
<tr>
<td>1:30 pm – 1:50 pm</td>
<td>Size, reproduction, and molt of invasive monk parakeets in south Florida.</td>
<td>M. L. Avery, E. A. Tillman, K. L. Keacher, and K. J. Lundy</td>
</tr>
<tr>
<td>1:50 pm – 2:10 pm</td>
<td>Ecological monitoring of a newly created secondary dune.</td>
<td>M. R. Bolt, M. A. Mercadante, and S. K. Weiss</td>
</tr>
<tr>
<td>2:10 pm – 2:30 pm</td>
<td>Extending the ecological corridor on pine rockland fragments through ecosystem restoration on publicly and privately owned lands in Miami-Dade County.</td>
<td>S. V. Martin</td>
</tr>
<tr>
<td>2:30 pm – 2:50 pm</td>
<td>Break</td>
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<tr>
<td>2:50 pm – 3:10 pm</td>
<td>Florida wildlife and wind energy: Danger on the horizon?</td>
<td>D. J. Judy and N. S. Gikas</td>
</tr>
<tr>
<td>3:10 pm – 3:30 pm</td>
<td>Formation of an invasive plant management advocacy organization in Florida, the Invasive Plant Management Association (IPMA).</td>
<td>J. L. Burney, Jr.</td>
</tr>
<tr>
<td>3:30 pm – 3:50 pm</td>
<td>Evict the Invaders! Three activities to educate citizens in an area surrounding a county preserve about invasive plants’ threats.</td>
<td>K. Mac Millen</td>
</tr>
<tr>
<td>3:50 pm – 4:10 pm</td>
<td>“Seek and Destroy” invasive plant activity for 4-12 grade.</td>
<td>K. Lane and A. Richard</td>
</tr>
<tr>
<td>4:10 pm – 4:30 pm</td>
<td>The Development and Distribution of Greener Choices, Alternatives to Invasive –Exotic Plants, With Help from the Kathy Craddock Burks Education Grant.</td>
<td>B. Gugliotti</td>
</tr>
<tr>
<td>4:30 pm – 4:50 pm</td>
<td>Finding overlap between CISMA goals and private landowner benefits: Experiences from the Treasure Coast.</td>
<td>M. Renda, M. Yustin, A. Flanner, C. Mason, K. Gioeli, J. Smith, and M. Spada</td>
</tr>
</tbody>
</table>
Technical Session II – Arlington/Monmouth/Laurel Rooms

Wednesday, April 18, 2012, 8:30 am – 11:50 am

8:30 am – 8:50 am  Predicted changes in foraging habitat of the little blue heron (Egretta caerulea) as a function of sea level rise in the Great White Heron National Wildlife Refuge.  L. Calle, D. E. Gawlik, Z. Xie, and B. Johnson (STUDENT)

8:50 am – 9:10 am  Feeding Ecology and Potential Impacts of an Introduced Iguanid (Ctenosaura similis).  S. Funck and P. Allman (STUDENT)

9:10 am – 9:30 am  Hydroperiod, food, and competitor density differentially influence the body condition of Everglades’ fish and crayfish.  J. A. Klassen and D. E. Gawlik (STUDENT)

9:30 am – 9:50 am  Predicting the distribution of invasive plant species in the Everglades Cooperative Invasive Species Management Area using aerial survey data.  T. Fullman, J. Steele, C. Brown, M. Hyman, K. Sauby (STUDENT)


10:10 am – 10:30 am  Break

10:30 am – 10:50 am  Effect of herbicide treatments on above- and below ground biomass of Japanese climbing fern.  S. N. Miller, K. K. Bohn, and M. Thetford (STUDENT)


11:10 am – 11:30 am  Biology, impact, and field host specificity of Calophya terebinthifolii (Hemiptera: Calophyiidae), a candidate for biological control of Brazilian peppertree, Schinus terebinthifolius (Sapindales: Anacardiaceae).  J. P. Cuda, L. R. Christ, W. A. Overholt, and M. D. Vitorino
Poster Session – Santa Anita/Del Mar Rooms

Wednesday, April 18, 2012, 6:00pm – 7:00 pm
Meet with Authors  |  Sponsored by the University of Florida – Wildlife Ecology and Conservation Department

Development of a cost-effective feral swine-specific oral delivery system.  T. A. Campbell, E. A. Tillman, and M. L. Avery

Wading bird physiology and prey availability at Lake Okeechobee.  J. E. Chastant and D. E. Gawlik (STUDENT)


The Florida Invasive Species Partnership, working together to prevent and manage invasive species across boundaries in Florida.  R. Godfrey, E. P. Myers, K. Serbesoff-king, and K. P. Brown

Our animal family – a proactive approach to animal issues.  A. Higgins and N. Chatelaine


The threat continues: An update on white-nose syndrome.  D. J. Judy and N. S. Gikas

Understanding the influence of red-imported fire ants on small mammals and reptiles.  A. K. Long and R. A. McCleery (STUDENT)


Disease surveillance in feral swine in Florida.  M. Milleson

Baiting the nine-banded armadillo.  H. K. Ober, L. W. DeGroote, C. M. McDonough, R. F. Mizell III, R. W. Mankin

The effects of hydrology on nodulation and nitrogen fixation in the invasive plant, catclaw mimosa (Mimosa pigra).  S. Sardes, X-H. Zhang, T. J. Givnish, and D. Owen (STUDENT)

Spatial invasives infestation and threat analysis model and map.  D. Tharp and C. Millett

Green iguana proliferation in the Key West National Wildlife Refuge: A by-product of Hurricane Wilma and a threat to the imperiled Miami blue butterfly?  T. J. Wilmers
Technical Session III – Arlington/Monmouth/Laurel Rooms
Thursday, April 19, 2012, 10:30 am – 3:10 pm

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:30 am – 10:50 am</td>
<td>Discussion of the USACE Unmanned Air System (UAS) Program.</td>
<td>J. Morton</td>
</tr>
<tr>
<td>10:50 am – 11:10 am</td>
<td>Alternative techniques for exotic plant control: different restoration methods at Big Cypress National Preserve.</td>
<td>J. N. Burch</td>
</tr>
<tr>
<td>11:10 am – 11:30 am</td>
<td>The Corps’ Early Detection, Rapid Response effort – <em>Tamarix canariensis</em> in northern Florida.</td>
<td>J. Spencer</td>
</tr>
<tr>
<td>11:50 am – 1:30 pm</td>
<td>Lunch (on your own)</td>
<td></td>
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<tr>
<td>1:30 pm – 1:50 pm</td>
<td>Using the <em>I’ve Got One</em> app for smartphones.</td>
<td>K. A. Rawlins, C. T. Bargeron, D. J. Moorhead, and G. K. Douce</td>
</tr>
<tr>
<td>1:50 pm – 2:10 pm</td>
<td>Bringing Cooperative Invasive Species Management Areas (CISMAs) to the military in Florida.</td>
<td>K. Serbesoff-King, B. Pelc, S. Bennett, C. Millett, M. Renda, and A. Higgins</td>
</tr>
<tr>
<td>2:10 pm – 2:30 pm</td>
<td>Germination and growth characteristics of carrotwood (<em>Cupaniopsis anacardioides</em>) seeds and seedlings.</td>
<td>K. Langeland</td>
</tr>
<tr>
<td>2:30 pm – 2:50 pm</td>
<td>Effects of herbicide application and prolonged flooding on para grass.</td>
<td>S.V. Rockwood, C. Mallison, and B. Thompson</td>
</tr>
<tr>
<td>2:50 pm – 3:10 pm</td>
<td>Can novel weapons favor native plants? Allelopathic interactions between <em>Morella cerifera</em> (L.) and <em>Schinus terebinthifolius</em> Raddi.</td>
<td>W. A. Overholt, J. P. Cuda, and L. Markle</td>
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SIZE, REPRODUCTION, AND MOLT OF INVASIVE MONK PARAKEETS IN SOUTH FLORIDA

Formerly imported by the thousands for the pet trade, monk parakeets (Myiopsitta monachus) have been in Florida for over 40 years. Although this conspicuous, charismatic species is now widely established, relatively little is known about its population biology outside South America. From nest removals and collections made by utility company personnel during maintenance operations in 2003 and 2004, we examined over 700 parakeets to document body size, reproductive biology, and molt. Consistent with previous genetic analyses, body measurements confirm that south Florida birds belong to the monachus subspecies. The breeding season commences in late winter/early spring, and the onset of primary molt coincides with the end of egg-laying in early April. During June-August, over 94% of the adults birds we examined were replacing primary feathers. The extent and timing of breeding and molt in south Florida are virtually identical to those in South America, although offset by approximately 6 months. While parakeets in south Florida retain a fixed annual cycle characteristic of the ancestral population, their flexible behavior enables them to adapt and thrive in new environments.

ECOLOGICAL MONITORING OF A NEWLY CREATED SECONDARY DUNE ON KENNEDY SPACE CENTER: FROM SANDPILE TO ECOSYSTEM IN 200 DAYS

Kennedy Space Center (KSC) is proposing an action to restore beach and coastal dune habitat that has been severely eroded over the past several years. Changes in the coastline have brought about increased frequency and severity of inundation events that threaten KSC infrastructure and assets, including natural habitats that support federally protected wildlife species. Predictions are that this trend will continue into the short and long-term future. In order to maintain infrastructure and preserve habitats, the beach and dunes need to be restored and protected from continuing loss. One of the proposed actions for this restoration project is the creation of a network of secondary dunes located inland from the current primary dune. A pilot secondary dune creation project was begun in summer 2010 in an area of coastal strand that was degraded from past human activities and storm events. The new dune is 221 m (725 ft) long, 24 m (80 ft) wide, and 4.6 m (15 ft) tall. Planting with native vegetation was done in April 2011. Two monitoring events have taken place, one in November 2011 and one in February 2012. Fifty-five 1 m² vegetation plots were sampled, 100% coverage gopher tortoise burrow surveys were done, and 44 small mammal traps were set for three consecutive nights during both monitoring events. Vegetation coverage was 41%, consisting of 24% desirable vegetation and 17% nuisance species. There were three gopher tortoise burrows, all occupied, present in both surveys. Four species of small mammals were captured, including 41 individual southeastern beach mice; 9 of these were captured during both surveys. A variety of other vertebrates have been documented at the site by either direct observation, prints, or scat. Before April 2011 when the dune was planted, it was a barren pile of sand. In seven months, it has become a functioning ecosystem, supporting well developing floral and faunal communities.
At least two more monitoring events are planned, one in May and one in August 2012, that will provide important information that can be used in the future as KSC contends with the realities of an eroding coastline that threatens valuable man-made assets and natural resources.

ALTERNATIVE TECHNIQUES FOR EXOTIC PLANT CONTROL: DIFFERENT RESTORATION METHODS AT BIG CYPRESS NATIONAL PRESERVE

For several decades Big Cypress National Preserve has maintained an aggressive and successful exotic plant management operation in a large (ca. 1100 sq. mi.) natural area. Removal and control of exotics mostly has been accomplished through medium to large contracted projects, by crews cutting and chemically treating target plants. Over time, exotics management has become more complex, considering added needs for re-treatments of some species, proliferation of new exotics (including animals), changes in regulations or requirements, and reduced budgets. We maintain moderately large-scale control operations, but have adjusted to include some methods to better suit changes that have developed in the past few years. Here we outline some alternatives that are being examined, including prescribed fire, aerial herbicide applications, clearing with heavy equipment, and reforesting; these are procedures that can be considered for use in supplementing traditional control. Each carries advantages, so that we can identify important aspects of each procedure, and speculate about benefits or disadvantages that may be part of a proposed technique. Many of these methods are being used in very disturbed areas that now possess little native habitat value. To re-establish more natural ecological value, the first step is removing exotics, so that establishment of native organisms and community succession can occur. The greatest part of work continues to be carried out by contracted entities, but administrative revisions in program requirements may indicate a need for contractors to consider similar changes in methods. We welcome creative recommendations for discussion about adjusting means and techniques for exotic plant control.

FORMATION OF AN INVASIVE PLANT MANAGEMENT ADVOCACY ORGANIZATION IN FLORIDA, THE 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 is now. As budgetary battles get tougher in Florida’s Capital, more and more it seems that public agency vegetation management budgets are shrinking and conservation/management trust funds are being swept. Although there has been very effective lobbying activity in Florida for supporting the public funding for aquatic plant management efforts for the last several years, there has not been a concerted effort by the invasive plant management (upland and aquatic) community as a whole. In spite of ongoing environmental education of both State and local legislators, there remains the dire need to further educate on the
necessity and public benefits of invasive plant management in Florida, which requires a solid public/private infrastructure dependent on sustainable public funding. Basically, the need has arisen for a community-wide effort to put an economic face on what most politicians see as only an environmental problem. Due to the inability of public employees and trade groups comprised heavily of agency personnel to lobby for funding, the responsibility to carry this message must fall on those in the private sector. In response to the financial crisis in Tallahassee and its direct negative influence on Florida’s natural resources and those dependent on managing natural lands and waters, a not-for-profit 501(c)(6) advocacy organization has been formed. This advocacy organization, the Invasive Plant Management Association (IPMA), has been organized with the intent: “It is the Mission of the Invasive Plant Management Association 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 sustainable State agency funding, exclusive of how the agencies distribute the funds through procurement (not concerned with influencing the Agencies’ individual contracting policies).

PREDICTED CHANGES IN FORAGING HABITAT OF THE LITTLE BLUE HERON (EGRETTA CAERULEA) AS A FUNCTION OF SEA LEVEL RISE IN THE GREAT WHITE HERON NATIONAL WILDLIFE REFUGE (STUDENT)

Wading birds are restricted to feeding in shallow water because of their leg-length constraint. In coastal systems, this sensitivity to water depth is pronounced, because tidal fluctuations control both the spatial and temporal extent of available foraging habitat. Our objective was to determine the risk of the little blue heron (Egretta caerulea) to sea level rise within the boundaries of the Great White Heron National Wildlife Refuge, in the Florida Keys, USA. Our approach to the problem was to develop a tide-driven simulation model to estimate foraging habitat availability (FHA). The FHA model incorporated fine-scale information on water depths used by the little blue heron and predicted changes in habitat availability from the Sea Level Rise and Accretion Model, under 3 sea level rise scenarios.

We validated the model's ability to predict available foraging habitat using locations of foraging little blue herons (N=509) observed during 14 surveys (Dec 2010 - Jul 2011). The model performed moderately well (78% correct classification using survey-specific FHA estimates), to very well (94% correct classification using mean annual FHA estimates), at predicting available foraging habitat. The majority (57%) of little blue herons foraged at areas with tide-specific FHA values of >7hectare-minutes. Under all three sea level rise scenarios daily foraging habitat declined, with the most severe declines occurring between 2050 and 2075. Our results may be liberal because we excluded mangrove islands as foraging habitat. We suspect that as mangrove habitats become inundated for longer periods of time they will become suitable foraging areas, if they are not already. The fine temporal scale of the FHA model (from a single-tide to days, months) makes it potentially useful for addressing short- and long- term stressors to multiple wading bird species resulting from human disturbance or sea level rise. However, the sensitivity of the model to very small changes in tide height underscore the importance of having improved estimates of sea level rise at the local level.

LEONARDO CALLE and DALE E. GAWLIK,
Environmental Sciences, Florida Atlantic University, 777 Glades Road, Boca Raton, FL 33431

ZHIXIAO XIE and BRIAN JOHNSON, Geosciences, Florida Atlantic University, 777 Glades Road, Boca Raton, FL 33431
DEVELOPMENT OF A COST-EFFECTIVE FERAL SWINE-SPECIFIC ORAL DELIVERY SYSTEM (POSTER)

Feral swine cause a diverse range of negative impacts, including agricultural losses, wildlife predation, habitat destruction, and spread of livestock and human diseases. New tools are being developed to control feral swine damage and diseases, including fertility control, vaccines, and toxicants, such as sodium nitrite. However, for any of these emerging technologies to be appropriate for field application, a cost-effective species-specific oral delivery system is needed. Prior investigations into oral delivery systems include work on feral swine-specific baits; these studies indicate that baits can be formulated and exist that feral swine find highly attractive and readily ingest. However, throughout portions of the United States other wildlife species ingest candidate baits at a high rate, which in most cases is undesirable. Consequently, investigations into feral swine-specific feeder systems that contain baits intended to deliver pharmaceuticals have commenced. Here we provide an overview of research activities related to feral swine-specific oral delivery systems in the United States, including applications, limitations, advantages, and disadvantages of different systems. We also provide an update on ongoing collaborative research with the Australian-made HogHopper™, an oral delivery system intended to deliver HOG-GONE® sodium nitrite baits.

TYLER A. CAMPBELL, ERIC A. TILLMAN and MICHAEL L. AVERY, USDA, APHIS, Wildlife Services, National Wildlife Research Center, 2820 East University Avenue, Gainesville, FL 32641

WADING BIRD STRESS RESPONSE TO PREY AVAILABILITY IN A MANAGED LAKE ECOSYSTEM (STUDENT POSTER)

The restoration of wetlands in south Florida is largely based on the premise that hydrologic patterns, fish populations, and wading birds are tightly linked. Hormones play an essential role in regulating an animal’s response to environmental disturbances and could determine how hydrologic patterns affect reproductive success and survival. Quantifying the physiological responses to environmental conditions will improve our understanding of how individuals react to immediate changes in resource levels as well as how long-term landscape habitat conditions may regulate reproduction and nesting patterns. Our study was conducted at Lake Okeechobee, a large (1732 km²), shallow (mean depth of 2.7 m), eutrophic lake located in central south Florida. Our goal was to determine the effects of prey availability across the Lake’s littoral zone on stress levels of Great egret (Ardea alba) and Snowy egret (Egretta thula) adults and chicks. Stress was measured using egg androgens, cellular protein chaperones (Heat Shock Protein 60), and steroid parameters (corticosterone). Preliminary results suggest prey availability may not have been a limiting factor for wading bird nesting in 2011, despite the low lake levels. We collected 21,034 aquatic animals from 128 random throw-trap samples at 64 random sites. Mean prey density was 164 ± 21 prey/m² with a maximum prey density of 936 prey/m². Total biomass of all specimens was 1923 g; mean prey biomass was 16 ± 1.7 g/m² with a maximum prey biomass of 59.9 g/m². Eighty chicks (n= 22 Great and n= 58 Snowy) were classified into two age groups, young (≤ 2wks) and old (≥ 2wks). There was no difference between species but young chicks had higher levels of HSP60 than older chicks. Similarly, a food-supplementation experiment with snowy egret chicks (n= 3 treatment and n=3 control nests) showed no drop in stress in the supplemented chicks.

JENNIFER E. CHASTANT, Department of Biological Sciences, Florida Atlantic University, 777 Glades Road, Boca Raton, FL 33431

DALE E. GAWLIK, Environmental Sciences Program, Florida Atlantic University, 777 Glades Road, Boca Raton, FL 33431
nor were there differences in stress levels as a function of hatch order. Additional years of data will help refine estimates of prey availability and hydrologic conditions that lead to a food limitation in wading birds on Lake Okeechobee.

BIOLOGY, IMPACT, AND FIELD HOST SPECIFICITY OF CALOPHYA TEREBINTHIFOLII (HEMIPTERA: CALOPHYIIDAE), A CANDIDATE FOR BIOLOGICAL CONTROL OF BRAZILIAN PEPPERTREE, SCHINUS TEREBINTHIFOLIUS (SAPINDALES: ANACARDIACEAE).

Brazilian peppertree, Schinus terebinthifolius Raddi (Anacardiaceae), a perennial woody plant native to Brazil, Argentina, and Paraguay has become one of the most invasive weeds in Florida. A leaflet pit galling psyllid, Calophya terebinthifolii Burckhardt & Basset, has been identified as a potential biological control agent. Field and laboratory research was conducted at Blumenau and Gaspar, Brazil, with psyllids collected from the Atlantic coastal region of Santa Catarina state. Results of field host range studies in Brazil indicated C. terebinthifolii is a Schinus specialist and growth chamber studies showed the psyllid is capable of reducing the growth of potted Brazilian peppertrees. The developing nymphs produce open pit galls on the adaxial (upper) side of the leaves (2.6 ± 1.8 galls/leaflet). Laboratory rearing studies focused on female fecundity (55.3 ± 8.9 eggs/ female), number and size of the immature stages, age-specific survivorship, and mean generation time (43.7 ± 1.2 days). Psyllids from the Atlantic coastal region of Santa Catarina appear to be locally adapted to Brazilian peppertree haplotype A plants, which occur in Florida. Using collection and survey locations of C. terebinthifolii in its native range and point locations for haplotype A plants in Florida, maps for predicting the likelihood of psyllid establishment were created with the MaxEnt ecological niche model. The climatic overlap included Volusia, coastal Pasco, and Hernando counties, and a small section of southwestern Polk County; these counties would be targeted for initial releases if the psyllid is approved for field release. Additional studies will focus on the psyllid’s fundamental host range to determine if C. terebinthifolii is sufficiently host specific and its performance on the two Brazilian peppertree haplotypes (A&B) and their hybrids that occur in Florida.

NEW FOREST SERVICE INVASIVE SPECIES MANAGEMENT POLICY: OVERVIEW AND NEXT STEPS (PLENARY)

In December of 2011 new Forest Service Policy was established for the management of invasive species. This policy replaces old policy that was directed solely at noxious weed management. The new policy identifies responsibilities and direction for the prevention, detection, and control of all invasive species, and the restoration of affected areas. An all-taxa approach will present new challenges and opportunities for National Forests and our partners, requiring new levels of collaboration, flexibility, and creative problem solving across jurisdictional boundaries. As policy moves into implementation, the National Forests in Florida will be looking to State and local agencies and to our conservation cooperators to forge effective, enduring approaches to managing all invasive taxa across all lands.
NATURAL ENEMIES OF MIKANIA MICRANTHA IN FLORIDA (POSTER)

*Mikania micrantha* Kunth is native to Central and South America and is considered to be one of the most serious invasive plants in Asia. It was discovered for the first time in North America in October 2009 near Homestead. To understand the impact of native natural enemies on *Mikania micrantha*, we are conducting field surveys in the Homestead area and laboratory experiments in our quarantine facility in Fort Pierce. The objectives of field surveys are to identify insect herbivores and diseases of *M. micrantha*, *M. scandens*, and *M. cordifolia* and measure the level of damage they cause. To date, we have found several natural enemies, including leaf rollers, leaf miners, mites, aphids, and foliar diseases damaging the three *Mikania* species. Several of the insect herbivores were found to attack the exotic and native species, indicating that local herbivores have expanded their host ranges to utilize the exotic species. The incidence of the foliar disease (*Septoria mikania-micranthae*) was measured from 1 m² of foliage, and in some sites, up to 80% of the area was affected. Our preliminary results clearly indicate that several natural enemies of the native *M. scandens* and *M. cordifolia* have expanded their host ranges to include the exotic *M. micrantha*. Whether the degree of damage inflicted by these natural enemies is sufficient to prevent *M. micrantha* from becoming a serious invasive plant in Florida, is not yet known.

RESPONSE TO EVIDENCE OF BREEDING POPULATIONS OF NILE MONITORS AND OUSTALET’S CHAMELEONS IN SOUTH FLORIDA (SYMPOSIUM)

South Florida is home to at least 48 species of non-native reptiles, most of which are lizards. The Florida Fish and Wildlife Conservation Commission (FWC) works with its partners to determine the potential environmental, economic, and social impacts that non-native species may have in Florida to formulate an appropriate management response. Recent discoveries of breeding populations of Nile monitors (*Varanus niloticus*) on the east coast of South Florida and Oustalet’s chameleons (*Furcifer oustaleti*) in Florida City led to a rapid response and assessment of these populations by FWC and cooperators with the Everglades Cooperative Invasive Species Management Area, particularly the South Florida Water Management District, the University of Florida’s Ft. Lauderdale Research and Education Center, and Zoo Miami employees with Miami-Dade County Parks, Recreation, and Open Spaces. Both populations seem to be relatively localized due to habitat constraints but removal efforts have yet to deliver diminishing returns. For both species, data are being collected on the morphology, reproductive health and cycles, abundance and distribution, and for the Nile monitors, DNA analyses. Studies are being conducted to determine which species of native wildlife are in the diets of these two species. An earlier diet study on the Nile monitor population in Cape Coral, Florida, has already helped to determine that they are a species with potential to negatively impact native wildlife but the negative effects posed by chameleons may be more social than environmental. At this time eradication is the goal of these efforts but after an assessment phase to determine if this is possible, management plans for these species may consider containment, allow commercial harvest, both, or no action.
ASSESSING FERAL SWINE DAMAGE TO SENSITIVE PLANT COMMUNITIES AT AVON PARK AIR FORCE RANGE, FL

The impacts of feral swine rooting on commercial interests in the southeastern United States have received increased attention among popular media, yet measures of swine impacts on relatively intact ecosystems have remained limited. In order to assess the threat of feral swine to sensitive plant communities within the 42,897 ha Avon Park Air Force Range (APAFR), our objectives for an ongoing management project included quantifying rooting and indentifying the trends of rooting patterns among and across seasons and plant community types, while population indices and removal efforts were implemented simultaneously. Since December 2008, we measured feral swine rooting bi-annually by walking transects and recording the perimeters of observed rooting with hand-held GPS units, at sub-meter scales across 34 botanically important sites (292 ha) at APAFR. We surveyed 15 supplementary sites (296 ha) beginning April 2010 at the same spatial and temporal resolution. We categorized swine rooting based on its physical and biological traits according to 4 levels of severity and 4 classes of age. Across the 34 sites surveyed all six seasons, rooting varied seasonally, from a minimum of 0.66 ha rooted to a maximum 2.63 ha rooted, and over 3 years the rooting became proportionally more severe and recent. Some sites were rooted more consistently than others and several sites were rooted every season. Moreover, rooting overlapped 163 individual rare and sensitive plant records. Although we found some rooting amounts to vary with season, plant community type, and site location, season-to-season patterns in rooting at the 34 sites seem better explained by seasonal rainfall patterns and local hydrology than by indices of feral swine population trends.

PREDICTING THE DISTRIBUTION OF INVASIVE PLANT SPECIES IN THE EVERGLADES COOPERATIVE INVASIVE SPECIES MANAGEMENT AREA USING AERIAL SURVEY DATA (STUDENT)

Exotic plant invasions are a biological and ecological threat to the integrity and diversity of native ecosystems. The Nature Conservancy of Florida, together with other state institutions, monitors invasive plants annually and implements treatment and eradication strategies. Four terrestrial species are particularly threatening in Florida, especially in Everglades National Park. We used census data for Schinus terebinthifolius, Melaleuca quinquenervia, Lygodium microphyllum, and Casuarina equisetifolia collected by the National Park Service and South Florida Water Management District to model species distributions and predict suitable habitat for the Everglades Cooperative Invasive Species Management Area (ECISMA). A general linear model (GLM, binomial family) and maximum entropy (MaxEnt) model were developed for these regions. Comparisons were made between the utility of presence/absence (GLM) and presence-only (MaxEnt) models to assess the best approach for determining habitat suitability and inform future sampling efforts. Both presence/absence and presence-only models yielded similar results regarding significant covariate predictors.
of habitat suitability. Analysis using Fragstats showed high levels of spatial clustering on the landscape for all species (Clumpiness> 0.7). Species showed marked differences, however, in their response to environmental covariates. Landcover classification was a strong explanatory variable in both GLM and MaxEnt models. Casuarina, Melaleuca, and Schinus all utilized evergreen forest more than expected due to chance, while Lygodium tended to concentrate in wetland habitats. Climate appears not to strongly influence Schinus distribution but may limit Casuarina. These findings are important to management agencies and stakeholders such as the Nature Conservancy as they can inform likely areas for invasive species presence, improving the efficiency of management and removal efforts.

FEEDING ECOLOGY AND POTENTIAL IMPACTS OF AN INTRODUCED IGUANID (CTENOSAURA SIMILIS) (STUDENT)

The introduced Central American black spiny-tailed iguana (Ctenosaura similis) has disjunct populations throughout southern Florida (Krysko, 2003; Townsend, 2003b), one residing on Keewaydin Island (KI) in Collier County. Little information is known about the biology of this introduced population and how it may influence its host environment. I investigated aspects of this population’s feeding ecology to determine which life history or environmental factors may contribute to variation in their diets and to determine some potential ecological implications of their diets. Specimens were obtained over a year period using noose poles, opportunistic hand captures, and through donation from an environmental state agency. Stomach contents were then identified as completely as possible and grouped into food resource categories. Fifty-four iguanas in all age classes and sexes were captured in four sampling seasons. Fifty-six food resource categories were identified, most to the level of family. Results indicate that an ontogenetic diet shift occurs in this population around 100 mm snout-vent length (SVL), with smaller juveniles feeding on more animal prey items, then switching to primarily plant material as they grow, 87% by volume. Plant families consumed by adults included Fabaceae (legumes), Compositae (asters), Bignonaceae (trumpet creepers), Myrtaceae (myrtles and guavas), Euphorbiaceae (spurges) and Poaceae (grasses). Significant differences in diet also existed between seasons. This population appears to be feeding similarly to C. similis in their native range, by exhibiting a broad diet with the presence of a diet shift. Ctenosaura similis as an introduced species may exhibit diet plasticity and may feed opportunistically, thus contributing to its success in a foreign environment.
IMPLEMENTING AN EDUCATIONAL CAMPAIGN: NEW IPM STRATEGIES FOR HYDRILLA MANAGEMENT

Hydrilla is one of the most troublesome aquatic weeds in the US, and millions of dollars are spent each year managing it. This submersed plant can dominate water bodies, interfere with flood control, and inhibit navigation if left unmanaged. Thanks to a new 4-year grant from the USDA National Institute of Food and Agriculture, University of Florida/IFAS research and extension faculty, FAMU faculty and an ARMY Corps researcher are tackling the problem head-on. This team is studying new chemical and biological control methods as part of an overall hydrilla integrated pest management (IPM) plan and transferring the information to stakeholders. The goal is to increase stakeholder awareness of research-based information regarding the hydrilla miner and other sustainable strategies for managing hydrilla. Materials are being developed that will help resource managers understand how new strategies for managing hydrilla fit into a hydrilla IPM plan. We have begun the implementation of a public information campaign which includes a needs assessment survey. The information distribution platform will include field tours and demonstrations, educational publications and exhibits, promotional items, project websites, and presentations at professional and stakeholder meetings. Extension faculty will be provided with tools to educate more diverse audiences focusing on new strategies to enhance IPM. By 2014, a finalized package will be available for delivery by county faculty in Florida and other states that struggle to manage hydrilla. Researchers are hopeful that new tactics, such as the hydrilla miner, will be incorporated into IPM programs, reducing costs and ultimately creating more favorable recreational areas on lakes that have become almost unusable because of dense hydrilla infestations. Extension faculty and the eXtension website will be integral in educating stakeholders nationwide about hydrilla IPM strategies. The purposes of this presentation are to provide an update on the hydrilla needs assessment survey and to inform participants about the hydrilla IPM plan currently under development.

THE FLORIDA INVASIVE SPECIES PARTNERSHIP, WORKING TOGETHER TO PREVENT AND MANAGE INVASIVE SPECIES ACROSS BOUNDARIES IN FLORIDA (POSTER)

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. The mission is to foster partnerships as an additional tool in these efforts, 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 forestlands, natural communities, and biodiversity in Florida. Since its inception in 2005, FISP has created an array of tools, all of which are housed on the FISP website (FloridaInvasives.org). These include a searchable database of cost-share programs, grants, and/or technical assistance available to Florida landowners and land managers. In 2007, FISP began promoting Cooperative Invasive Species Management Areas (CISMAs) in Florida. To date, there are 16 CISMAs covering 45 counties (67%), over 62% of the land mass of Florida. FISP supports
INCLUSION OF THE AUSTRALIAN WEED RISK ASSESSMENT SYSTEM INTO THE USDA PLANT RISK ASSESSMENT PROCESS (PLENARY)

The most efficient and effective approach to reducing the impacts of invasive species is to preclude their import before they reach the border of a new region. This approach requires a screening process that can effectively differentiate species with high versus low probability of becoming invasive. Australia and New Zealand have used a risk assessment for regulating plant imports for over a decade. In hopes of adopting this more proactive approach in the U.S., we tested the accuracy of the Australian Weed Risk Assessment system (WRA) in Florida. Evaluation of 158 vascular plant species from 52 families revealed that the WRA correctly predicted that 92% of major invaders had a high, and 73% of the non-invaders had a low probability of becoming invasive. Of the remaining non-invaders, 8% were incorrectly predicted to become invasive and 19% required further evaluation. Assessment of results available for similar tests from other continental and island and tropical and temperate systems showed the same average accuracy. We also demonstrated that none of 100 additional species that had been introduced into the U.S. for horticultural purposes within the last 15 years would have been predicted to pose a risk of becoming invasive, affirming that pre-import screening of new species would likely have little impact on that industry. We then worked with the U.S. Department of Agriculture laboratory with responsibility for conducting risk assessments (USDA-APHIS-PPQ-CPHST-PERAL) to incorporate our results into their methodology, which was under revision. The USDA risk assessments provide the data for regulatory listing of species on the Noxious Weed List. The new approach developed by PERAL was based on the WRA and has similar accuracy. We have subsequently modified the New Zealand Aquatic Weed Risk Assessment for use in the U.S., having found that the WRA does not discriminate well between aquatic plant invaders and non-invaders. The modified tool, however, correctly identifies major invaders 85%, and non-invaders 94% of the time. We are now working to ensure that the PERAL methodology is similarly accurate for aquatic plants or is modified to match or exceed this accuracy.

THE DEVELOPMENT AND DISTRIBUTION OF GREENER CHOICES, ALTERNATIVES TO INVASIVE –EXOTIC PLANTS, WITH HELP FROM THE KATHY CRADDOCK BURKS EDUCATION GRANT

As the Lake County Cooperative Invasive Species Management Area (CISMA) began doing outreach, we wanted to have materials to give to the public that would allow them to “take our message home.” We wanted something that the public could use when making landscape decisions and bring with them to the nurseries that would help them choose beneficial native plants, instead of invasive, exotic plants that are, unfortunately, still being sold in nurseries. We looked around and there were a number of examples of similar brochures, but nothing specific to our area. Working as a committee within the CISMA, we put together the brochure and Lake County Information Outreach was able to help with the graphic design. The Lake County CISMA applied for the Kathy Craddock Burks Education Grant to mass produce color copies to be given out to the public during outreach opportunities. The Lake County CISMA was awarded the Kathy Craddock Burks Education Grant for $909.00 for the printing of 900 full color copies of the brochure. This presentation will fulfill the Lake County CISMA’s obligation for reporting our results for the grant.
The 900 copies of the brochure have been given out to members of the public attending various talks, presentations, and events. They have been distributed through a number of agencies and organizations. We are now printing more copies, and the information is also available in a digital format. This presentation will touch on the development of the brochure, it will go through a power point presentation that can accompany the brochure for public outreach, and it will discuss the distribution of the brochure.

HISTORICAL AND ECOLOGICAL CONSIDERATIONS FOR NON-NATIVE SPECIES POLICY AND MANAGEMENT IN FLORIDA (PLENARY)

Florida Fish and Wildlife Conservation Commission (FWC) regulations prohibit the release of non-native species. However, Florida’s receptive climate and major ports of entry have facilitated a long history of importation and culture of exotic fish and wildlife, much of which pre-dated current regulations, resulting in the establishment of at least 125 species of non-native freshwater aquatic life, wildlife, and marine life. The approximate rate of establishment of non-native species exceeds the so-called “rule of 10s,” which posits that one in 10 introduced species become established and, of those that become established, one in 10 becomes invasive. This higher rate is due to a climate match for tropical fauna and high propagule pressure from aquaculture and the pet industry. Despite the relatively high rate of establishment, the number of demonstrably problematic species represents roughly five percent of the number of observed exotics. In view of the history and occurrence (captive and wild) of non-native species in Florida, FWC has adopted a risk-based regulatory and management approach. There are restrictions on possession of the minority of species believed to pose greater risks to the economy, environment, or human health and safety. In policy terms, FWC strongly endorses responsible pet ownership and believes that a well regulated pet industry is preferable to driving the traffic underground. In similar fashion, for established non-native species, FWC’s management response is commensurate with the magnitude of potentially adverse impacts, which should be determined through science-based risk analysis.

OUR ANIMAL FAMILY – A PROACTIVE APPROACH TO ANIMAL ISSUES (POSTER)

The Our Animal Family partnership and educational effort hinges on the humane treatment of all animals, domestic and wild. It started in the Florida Keys in 2008 as a series of facilitated workshops to decrease predator pressure on the endangered Lower Keys Marsh Rabbit. Because both native raccoons and non-native feral cats were initially fingered as “problems that needed to be dealt with,” early meetings got a little heated as the group worked through a lot of misinformation and mistrust between the “cat people,” the “raccoon people,” and the U.S. Fish & Wildlife Service. Those that were brave or foolhardy enough to keep listening to each other realized that the problem was not the animals, but human behavior. No cat should be dumped in the first place, and backyard practices that encourage raccoon ganging should be avoided. The once-polarized
groups soon agreed upon a comprehensive set of strategies and established a proactive coalition to work together. In other words, we cannot change animal behavior, but we can change our own. The local effort focuses on two main themes; (1) Keep Wildlife Wild: drive carefully, secure trash, maintain distance, don’t feed, and plant natives; and (2) and Protect Your Pets: spay/neuter, keep dogs leashed, keep cats indoors, license and microchip, and never abandon. We work together on grant writing and educational campaigns, and have appeared in a documentary by American Bird Conservancy. The Our Animal Family movement has now become a way for all animal organizations to pool their effort, talents, and money towards the big picture. We invite any organization, agency, or individual that is committed to our themes and actions to get involved where they live.

DEVELOPMENT OF NON-NATIVE CONSTRICTOR SNAKE TRAPPING METHODOLOGY: TWEAKING THE TOOLBOX FOR INVASIVE REPTILE MANAGEMENT IN FLORIDA (POSTER)

The invasive Burmese python (Python bivittatus) is a large constrictor snake that is now well-established and apparently increasing in south Florida. A large python population could have major detrimental impacts to native wildlife populations, and there is increasing recognition among Federal, state, and regional agencies of the urgency to develop and implement effective control methods. Numerous studies have been conducted on the biology of this invasive population, but there is currently no operational control program in place. Conceptually, an integrated management program targeting Burmese pythons will include various approaches including road and levee surveys, use of detector dogs, and live-trapping. Previous efforts to apply traps, drift fences, and attractants have met with little success. In the case of the Burmese python, the lack of trap success to date could be due to problems with any or a combination of factors including trap design, the attractant used, placement strategy, or python density in the vicinity of test sites. In outdoor pens in Gainesville, we have tested a variety of trapping techniques on captive pythons, and this research has led to the development of a live trap that is specific to large snakes. Research is on-going to develop attractants and techniques to complement this new trap design.

NEW DEVELOPMENTS IN FEDERAL POLICY FOR INVASIVE ANIMALS AND PLANTS (PLENARY)

Congress is considering draft legislation called the Invasive Wildlife Prevention Act. This aims to reform the section of the Federal Lacey Act that addresses injurious non-native animals. It is a 112 year-old law that is broadly recognized as a failure, being far too slow and ineffective. Numerous animal invasions have resulted from this failure. At the same time, both the U.S. Fish and Wildlife Service and the Congress have adopted or proposed new laws to prohibit various large constrictor snake species (boas, pythons, anacondas). The evolution and status of these new Federal constrictor snake policies will be addressed. On the plant side, in June of 2011 the U.S. Department of Agriculture issued a final regulation for imports of all nursery plants that dramatically enhances the agency’s ability
to take precautionary steps to prohibit invasive plants. This is known as the Quarantine
37 revisions, which created a new regulatory category for plant imports called Not
Authorized Pending Plant Risk Assessment (NAPPRA). USDA has taken a major first step
in implementing this new regulation. The presentation will cover the contours and status
of NAPPRA and discuss it as an innovative policy model for how the Federal government
should address animal imports as well. This presentation will be made by the Policy Lead
on invasive animals for the National Environmental Coalition on Invasive Species, to which
both The Wildlife Society and the National Association of Exotic Pest Plant Councils belong.
The presenter has worked closely with these organizations connected to both the animal
and plant import policy reforms. He will outline ways members of these organizations can
continue to engage in and influence Federal developments in these areas.

“ED” AND INVASIVE REPTILES IN FLORIDA (SYMPOSIUM)

Florida holds the dubious distinction as being the global capital for reptile invasions. As
of early 2012, there are more than 50 species of non-native reptile species known to
be breeding in the Sunshine State. The vast majority persist in relatively small, localized
populations with no obvious negative impacts. However, some species have significantly
expanded their ranges with negative impacts on the state’s ecology, economy, and the
quality of life of Floridians. Prominent among this latter group are several species of large
snakes and carnivorous lizards. Specifically, these include pythons, anacondas, monitor
lizards, and tegu lizards. Although prevention should always be the goal, once a species
has been introduced outside its native range, ‘early detection/rapid response’ (EDRR)
becomes an important management tool. The Introduced Reptile Early Detection and
Documentation program, or ‘REDDy’, is a free, online educational program to train observers
to identify and report sightings of several species of large, invasive reptiles. Thus, REDDy
is the crucial ‘ED’ portion of a growing EDRR network of natural resource managers and
concerned citizens in Florida that is targeting particular species of invasive reptiles. During
my presentation I will discuss select details of the REDDy training module, provide summary
statistics for program participation, and briefly explain how REDDy is integrated with rapid
response efforts. Production of the REDDy program was a cooperative effort among the
Everglades Cooperative Invasive Species Management Area, the National Park Service, The
Nature Conservancy, and the University of Florida’s Cooperative Extension Service. Funding
for REDDy was provided by the South Florida National Parks Trust, the Ferris Greaney
Family Foundation, and the USDA Natural Resources Extension Act. To learn more about
REDDy and to take the online training module please visit http://ufwildlife.ifas.ufl.edu/ and
click the “Are you REDDy?” link.

FLORIDA WILDLIFE AND WIND ENERGY: DANGER ON THE
HORIZON?

Alternative energy, such as wind, provides cleaner, more efficient alternatives to the use
of fossil fuels. This energy source is currently expanding across the United States with
approximately 31 states having wind power capacities greater than 10 megawatts (1
megawatt = 1,000 homes). While this cleaner energy certainly provides environmental and
economic benefits, it has also caused detrimental ecological impacts in the form of bat and avian deaths as well as habitat loss. Wildlife is an integral part of Florida’s ecosystem. Florida is home to eighteen species of bats; however, only seven are commonly found in the state. Two species (Indiana bat and gray bat) are listed by the United States Fish and Wildlife Service as federally endangered, with the Indiana bat considered extirpated. In addition to these two species, the Florida Fish and Wildlife Conservation Commission lists the Florida mastiff bat as state endangered. Current studies indicate species classified as tree bats account for the greatest number of fatalities. Florida is home for three tree bat species and a seasonal stopover for another. Additionally, Florida is home to hundreds of avian species that may be impacted by wind farms including, but not limited to, eagles, wood storks, and snail kites. While Florida is not considered ideal for large wind facilities, changes in technology have made smaller wind farms economically feasible. Statewide coordination and planning supplemented with extensive population monitoring and surveys are imperative if such detrimental ecological impacts are to be managed and avoided.

THE THREAT CONTINUES: AN UPDATE ON WHITE-NOSE SYNDROME (POSTER)

Six years after its discovery in New York, white-nose syndrome continues to devastate bat populations throughout the eastern United States and Canada. To date, white-nose syndrome has been confirmed or suspected in 19 states and 4 Canadian provinces and it is estimated that the death toll exceeds 5.5 million bats. White-nose syndrome, named for a newly described white fungus, Geomyces destructans, is often observed on the muzzles, ears, and wings of infected bats. The first documentation of white-nose syndrome occurred during winter of 2005-2006 in Howes Cave in New York and has consistently spread ever since. Currently, three federally endangered species, the Indiana bat (Myotis sodalis), Virginia big-eared bat (Corynorhinus townsendii virginianus), and gray bat (Myotis grisescens) have been impacted by white-nose syndrome. Additionally, non-listed species, such as the little brown bat (Myotis lucifugus), northern long-eared bat (Myotis septentrionalis), tri-colored bat (Perimyotis subflavus), southeastern bat (Myotis austroriparius), and big brown bat (Eptesicus fuscus) have been severely impacted. The United States Fish and Wildlife Service recently amended survey protocols throughout the range of the Indiana bat by implementing increased acoustic surveys (thus reducing mist netting) in order to limit the potential for transmission. Thus far, Florida has avoided the effects of white-nose syndrome; however, with gray bats, southeastern bats, and tri-colored bats as residents, the threat remains.

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HYDROPERIOD, FOOD, AND COMPETITOR DENSITY DIFFERENTIALLY INFLUENCE THE BODY CONDITION OF EVERGLADES’ FISH AND CRAYFISH (STUDENT)

Body condition is a metric that integrates habitat space, food resources, and the individual’s ability to acquire suitable habitat and resources. For aquatic species living in fluctuating wetlands, body condition affects the quantity and quality of food that can be transferred to higher trophic levels, such as predatory wading birds. Our goal was to determine how changing habitat, resources, and competitor density affects prey-species body condition. We quantified the body condition of seven fish and two crayfish species using length and weight measurements from 39,638 individuals captured in throw-traps across the Everglades’ ecosystem during 2005–2011. We modeled body condition as a function of hydroperiod as a proxy for habitat, flocculent layer thickness within each throw-trap as a measure of available resources, and the number of fish or crayfish within a throw-trap as a measure of competitor density. Body condition was higher in areas with longer hydroperiods for all fish species. This trend was particularly strong for the golden topminnow (Fundulus chrysotus). We found different trends in relation to flocculent layer thickness and competitor density. Body condition for the bluefin killifish (Lucania goodei), goldentop minnow, and marsh killifish (Fundulus confluentus) increased with increasing flocculent layer thickness, whereas flocculent layer thickness has the opposite effect on the remaining four fish species. Increased competitor density decreased the body condition of the bluefin killifish, flagfish (Jordanella floridae), and marsh killifish, but increased the body condition of four fish species. Additionally, the interaction term between hydroperiod and flocculent layer thickness was strongly correlated with the body condition of the mosquito fish (Gambusia holbrooki) and the salmin molly (Poecilia latipinna); body condition was likely to be high if both hydroperiod and flocculent layer thickness was high. Body condition for both crayfish species increased with increasing flocculent layer thickness. However Procambarus alleni body condition decreased with longer hydroperiods and high competitor density, whereas Procambarus fallax body condition increased. Our results suggest that changes in habitat conditions differentially affect the body condition of common aquatic prey species in the Everglades. Such body condition changes can have emanating impacts on wading bird foraging and nesting success.

“SEEK AND DESTROY” INVASIVE PLANT ACTIVITY FOR 4-12 GRADE.

“Seek and Destroy” Invasive Plant Identification Mapping and Removal is a hands-on activity that provides plant identification, mapping and removal lesson plans for Florida students grades 4-12. Students who participate in these activities will be able to define what an invasive plant is; identify three invasive plants on or near their own school property; learn how to use EDDMapS to document these plants and demonstrate Best Management Practices for proper disposal of the invasive plants that were identified. The effort to develop this curriculum received one thousand dollars from the FLEPPC Kathy Craddock Burks Education Grant. This project involves a partnership between Florida Invasive Plant Education Initiative (UF/IFAS), the FWC Invasive Plant Management Section (which funds the Initiative), and select Florida science teachers. The grant was used to purchase...
invasive plant tape and allowed us to demonstrate the efficacy and refine the plan. “Seek and Destroy” was tested at a few schools in Clay County and was received with great enthusiasm from the students and teachers. The lesson plan will now be added to the curriculum at the IFAS Annual PLANT CAMP, which will help to extend this information and knowledge throughout Florida. It will also become part of UF/IFAS Center for Aquatic and Invasive Plants online curriculum at http://plants.ifas.ufl.edu/education/ making it accessible to anyone.

GERMINATION AND GROWTH CHARACTERISTICS OF CARROTWOOD (CUPANIOPSIS ANACARDIOIDES) SEEDS AND SEEDLINGS

Studies were conducted to determine seed germination and seedling growth of carrotwood in response to deposition, light, and the effects of salinity on seedling growth. Germination, indicated by radicle emergence, was 89% (SE=4.3) from one of two seed collection sites and 30% (SE=6.6) from another site. Radicle emergence was not different between seeds exposed to full sun or shade for the two collection sites (P=0.55, P=.40), which suggests that germination will occur equally well if seeds are deposited under dense vegetative canopy or in the open. Radicle emergence was rapid and regression analysis predicted that no additional germination occurred after 27 days (y=27-x, r2=0.70, P<.0001), suggesting the recalcitrant nature of the seed, for one of the seed collections but time after planting explained little of the variability in germination (r2=0.18) of seed from the other site. Seven months after planting, plants grown in 99% shade had less (P<.0001) root weight (52 mg, SE=20.0), shoot weight (67 mg, SE=29.5), number of leaves (2.4, SE=.64) and leaflets (4.8 SE=1.38) than root weight (289 mg, SE=133.1) shoot weight (319 mg, SE=92.9) leaves (4.1, SE=1.12) or leaflets (10, SE=2.8) of plants grown in 85% sunlight. In one of two similar experiments, shoots grew at salinity concentrations of 1, 10, and 30 ppt but growth rate was decreased as salinity increased and no growth occurred at concentrations of 50 or 80 ppt. In the second experiment, shoots grew only at salinity concentrations of 1 and 10 ppt and growth was much slower at 10 ppt compared to 1 ppt. Growth did not occur in the second experiment at 30, 50, or 80 ppt. Roots in the first experiment grew in salinity concentrations of 1, 10, and 30 ppt but growth decreased as salinity concentrations increased, and root-growth did not occur at 80 ppt. Root growth only occurred at the two lowest salinity concentrations in the second experiment.

UNDERSTANDING THE INFLUENCE OF RED-IMPORTED FIRE ANTS ON SMALL MAMMALS AND REPTILES (STUDENT POSTER)

Invasive species may cause a loss or decrease in populations of native species. Of primary concern are invasive species that have an economic, environmental, and human health impact, such as the red-imported fire ant (Solenopsis invicta).

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Fire ants are an invasive species that was introduced into the southeastern United States in the 1930s – 1940s. Research has focused on the effects of fire ants in human-mediated disturbed habitat, while little is known about the ability of fire ants to invade native ecosystems and the influence of their presence on native wildlife. The effect of fire ants on wildlife is of particular interest in native ecosystems, such as the longleaf (Pinus palustris) wiregrass (Aristida stricta) ecosystem, which supports unique and diverse communities of flora and fauna. I suggest 4 main mechanisms under which fire ants may influence wildlife population dynamics. These include direct impacts of predation and competition and indirect impacts of risk of injury, shift in reproductive timing, and increasing an individual’s susceptibility to predation by other predators. I propose using a controlled experiment to explore how fire ants influence small mammals and reptiles by using two native small mammal species, cotton rats (Sigmodon hispidus) and oldfield mice (Peromyscus polionotus), and a native reptile, the eastern fence lizard (Sceloporus undulatus), as model species. I will stock 8 0.2 ha enclosures with wild-caught individuals of each species. I will have four treatments including a control with ambient numbers of fire ants and predators, fire ants reduced and predators excluded, ambient numbers of fire ants and predators excluded, and fire ants reduced and ambient numbers of predators. To assess differences in demography between treatments, I will calculate abundance, survival, recruitment, the proportion of reproductive females, and population growth for each species within the enclosures using mark-recapture methodology. I will also quantify differences in body condition, stress hormone levels, and reproductive timing between treatments. Understanding these influences can help managers decide where invasive species management is necessary, what species and/or populations are most at risk, and help them balance the cost of management with an invasive species relative ‘cost’ to the environment.

COYOTES IN FLORIDA – THE GOOD, THE BAD, AND THE UGLY

Coyotes are a relatively recent addition to the fauna of Florida, as well as the entire eastern United States. Throughout their newly expanded range, arguments have waged as to whether coyotes represent a new and unwanted invasive species or if coyotes represent a new native species through range expansion that may actually serve important ecological roles in landscapes where larger predators have been mostly eradicated. There are also concerns as to the impacts coyotes may have on livestock production and on people and their pets. This presentation draws from surveys and research conducted in Florida and elsewhere, and provides an overview of the role of coyotes in Florida including potential positive and negative impacts on wildlife, livestock, and people. This presentation has been used widely in Florida for educational purposes by myself, the Cooperative Extension Service, and the Florida Fish and Wildlife Conservation Commission.
EVICT THE INVADERS!

Low-income, high-poverty, rural citizens usually do not list weed reduction among their pressing needs. However, these citizens usually do have a garden, pets or livestock. When they live near a county preserve, their land choices and the preserve’s affect each other. We developed three activities to try to show these citizens the harm invasive plants can bring and ways to reduce invasive plants. The Florida Exotic Pest Plant Council donated nearly $500.00 to fund these activities. The first activity was originally oriented towards younger children. When two high schools approached us about working at our preserves, we adapted this activity and turned it into seven-event high school competition. Each school had a team of 1-4 students compete in each event, such as Longest Skunk Vine. Students chose field guides as event prizes, and the school with the most wins received a small 1st prize award and two Simpson’s Stoppers. FLEPPC’s donation bought the field guides and small awards. The Nature Coast chapter of the FNPS contributed the Simpson’s Stoppers. The second and third events have been planned but not enacted at the time of writing. The second event is a mailing to all neighbors within .1 mile of the preserve. It includes a letter explaining how invasive plants damage plants and animals and twelve invasive plant knowledge sheets from IFAS/CAIP. Its purpose is mainly to raise awareness. FLEPPC will pay for the mailing. The third event is quite experimental. We are setting up a roadside stand – an informational table – with some enticing giveaways and educational materials about invasive plants, their threats, and their reduction. This table will be set up on a spring Saturday on the only road into and out of the preserve’s neighborhood. We hope to feature a large, bright display borrowed from Crystal River SP. Giveaways will be useful, such as a tape measure, funnel or ear plugs and will carry Evict the Invaders or Invader Plants Kill phrase. We are looking forward to reporting in April how this turns out. FLEPPC will pay for the giveaway and IFAS/CAIP will provide many of the materials.

INFLUENCE OF CLIMATE CHANGE ON INSECT-PLANT INTERACTIONS: IMPLICATIONS FOR BIOLOGICAL CONTROL IN FLORIDA (POSTER)

Global warming combined with rising atmospheric CO2 levels could have drastic effects on the performance of invasive weeds and their insect herbivores. The objective of this study was to evaluate the effect of elevated temperatures and CO2 levels on the performance of two invasive plant species and their presently effective biological control agents:

1) *Melaleuca quinquenervia* / *Oxyops vitiosa*, 2) *Alternanthera philoxeroides* / *Agasicles hygrophila*. A factorial experiment was conducted using two temperatures (28 and 32°C) and two levels of CO2 (400 and 800 ppm) in environmental growth chambers. Seedlings of each plant species (10 plants per treatment) were exposed to each of the four treatments for 21 days and several plant parameters (e.g., plant height, number of stems) were recorded weekly.

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Then, ten first instars of *O. vitiosa* or *A. hygrophila* were caged with each plant and survival, developmental time, adult size, and fecundity were recorded. Results showed that the two insect-plant combinations tested responded differently to climate change. *Melaleuca quinquenervia* plants growing under higher temperature and CO2 (32°C and 800 ppm) were taller and had fewer stems than other treatments, while no differences were detected in plant growth of *A. philoxeroides* among treatments. Percent survival to adulthood, adult size, and fecundity of *O. vitiosa* were similar among treatments. In contrast, high temperature at both CO2 levels greatly reduced immature survival, adult size, and fecundity of *A. hygrophila*. Thus, we predict that biological control of *A. philoxeroides* may be more severely disrupted by climate change than that of *M. quinquenervia*.

**EXTENDING THE ECOLOGICAL CORRIDOR ON PINE ROCKLAND FRAGMENTS THROUGH ECOSYSTEM RESTORATION ON PUBLICLY AND PRIVATELY OWNED LANDS IN MIAMI-DADE COUNTY**

Pine rockland is a globally imperiled ecosystem of which only two percent of the original habitat remains in scattered fragments across its historically narrow range in south Florida and the Bahamas. It provides habitat for six federally listed plant taxa and eight federal candidate plant taxa, as well as at least seventy-five state-listed and a myriad of rare plants, including a diverse palette of Caribbean plant species that are at the northern ends of their ranges, temperate plant species at the southern ends of their ranges, and endemic species with small ranges in southern Florida. In Miami-Dade County, pine rocklands occur along the Miami Rock Ridge, a Pleistocene deposit of oolitic limestone. This region has been almost completely developed and is home to over 2.5 million people. Thus, pine rockland is found only as small, isolated patches of habitat surrounded by homes, agricultural lands, and industrial parks. Significant decline in pine rockland habitat today is the result of the combined effects of habitat destruction, exotic plant invasions, fire suppression, and overall lack of management. For the past seven years, The Institute for Regional Conservation (IRC) has been active in researching and working to restore pine rockland with the goal of connecting, expanding, and improving the ecosystem’s quality through its Pine Rockland Initiative program. Today IRC has succeeded in treating over 500 acres of pine rockland habitat on public and private lands through biological research, ecological restoration, land management, partnering, outreach, and education. The Pine Rockland Initiative continues to work in Miami-Dade County, taking on the task of engaging private and public landowners in neighborhood habitat restorations aimed at connecting pine rockland fragments and extending the ecological corridor through restoration activities.

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AN INTEGRATED EARLY DETECTION, RAPID RESPONSE AND MONITORING PROGRAM FOR EVERGLADES INVASIVE REPTILES AND AMPHIBIANS (SYMPOSIUM)

Invasive species are a major threat to ecological integrity and biological diversity. Increasing attention is being spent on invasive reptiles and amphibians. South Florida has proven to be particularly vulnerable to invasion by reptiles and amphibians because it has a subtropical climate, a disturbed natural environment that provides habitat for invasive species (ponds, canals and levees), and major sources of non-native species from the pet trade (port of entry, captive breeders, and animal dealers). As a result Florida currently has the most species of introduced and established reptiles in the United States and the rate of accumulation of new species is increasing. Early detection and rapid response (ED&RR) efforts increase the likelihood that invasions will be successfully contained or eradicated while populations are still localized. Once populations are widely established, options for management become limited and expensive, and are often ineffective. The Everglades Invasive Reptile and Amphibian Monitoring Program (EIRAMP) was initiated in 2010 to address needs defined by the Everglades Cooperative Invasive Species Management Area ED&RR plan. This inventory and monitoring program is designed to meet science needs for invasive wildlife management. It provides natural area managers with life history and location information to contribute to development of effective control methods for non-native reptiles and amphibians. This program also involves surveying for native reptiles, amphibians, and mammals concurrently with surveys for invasive species. This provides baseline data to determine impacts of exotic species on native fauna and ecosystems within regional conservation lands.

EFFECT OF HERBICIDE TREATMENTS ON ABOVE- AND BELOWGROUND BIOMASS OF JAPANESE CLIMBING FERN (STUDENT)

_Lygodium japonicum_ (Japanese climbing fern) is an exotic plant that is problematic throughout the southeastern United States. _L. japonicum_ can grow into tangled masses that overtop trees, smother understory vegetation, and alter fire behavior. Invasions are especially concerning in plantations managed for pine straw, as straw bales may serve as vectors for dispersal. Due to the economic impacts of invasion, developing effective control techniques is particularly important. In addition to its sprawling fronds, the fern also forms an extensive root system and spreads via rhizomes. In order to achieve complete eradication, control methods must address belowground growth. The purpose of this study was to evaluate the efficacy of herbicides with different modes of action on controlling above- and belowground _L. japonicum_ growth. Pots of two native soils (sandy loam, loamy sand) were planted with _L. japonicum_ before being treated with 12 herbicides at three rates (0.5x, 1x, 2x recommended rate). Each treatment plus a control was replicated 10 times and organized in a complete randomized block design. Blocks were sampled at one and two months after treatment (MAT), and dry biomass was measured for fronds, roots, and rhizomes.

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Preliminary results show that above- and belowground biomass varied among herbicide treatments. Two MAT, glyphosate (Accord XRT II – containing surfactant) at 2x recommended rate yielded the lowest mean frond biomass for both sandy loam (15.66 g ± SE 3.22) and loamy sand (16.89 g ± SE 1.68) as well as the lowest mean root biomass for sandy loam (9.80 g ± SE 1.05). A second formulation of glyphosate (Accord concentrate – without surfactant) was also effective and exhibited the lowest mean root biomass in loamy sand (14.12 g ± SE 2.29) and the lowest mean rhizome biomass in sandy loam (1.82 g ± SE 0.21) when used at 1x recommended rate. Previous research has found glyphosate to have better visible long-term control of the fern compared to other herbicide types, likely due to its improved efficacy at reducing belowground biomass. Additional work will be done to assess the effect of herbicides on frond, root, and rhizome biomass and nutrient partitioning across harvest dates.

PYTHON PATROL: THE CHALLENGE OF RAPID RESPONSE TO INVASIVES THAT DON’T STAY PUT (SYMPOSIUM)

Effectively dealing with invasive animals provides an additional challenge compared to dealing with invasive plants: individuals can often move great distances or even move a short distance but out of sight. One way of addressing that challenge is to train those likely to encounter invasive animals to be able to safely remove them. For those likely to encounter these invasive animals who are unable or unwilling to remove them, another way to address the challenge is train them to accurately identify and report them to a rapid response team that can arrive while the reporter still has the animal in sight. Python Patrol comprises training for detectors/reporters (the “eyes and ears”), responders (the “catchers”), and the 1-888-IVE-GOT-1 hotline to connect them. More than 200 wildlife professionals, law enforcement officers, and others in the field have been trained to safely and humanely capture large-bodied invasive snakes, and to securely transport them to designated recipients so they can be used for research or training. The focus is on containment of the existing population of Burmese pythons while preparing the Early Detection Rapid Response (EDRR) capability where reports are still sparse to thwart the spread of establishment. Started in 2007 in the Florida Keys and expanded to the mainland of Florida in 2010, keys and challenges to implementing this model of EDRR include: identifying where to focus limited resources, working with partners including and existing systems, reaching key reporters and responders, navigating a media arena seeking juicy python stories in an effective manner, evaluating effectiveness with the ability to adapt, and ensuring continuity with time-limited funding. Working with partners at the Florida Fish and Wildlife Conservation Commission, including law enforcement and the Exotic Species Coordination Section, has been a major key to success.

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DISEASE SURVEILLANCE IN FERAL SWINE IN FLORIDA (POSTER)

Feral swine disease surveillance in Florida is conducted as part of the USDA APHIS National Wildlife Disease Program’s Comprehensive Feral Swine Disease Surveillance Program. Feral swine captured and euthanized throughout the state of Florida are tested for Classical Swine Fever, Pseudorabies, Brucellosis, Foot and Mouth Disease, Swine Influenza Virus, Trichinosis, Toxoplasmosis, and Leptospirosis. The poster will present an overview of the feral swine disease sampling program, including background information on the diseases mentioned, survey methods used, a summary of results from 2006-present, and distribution maps.

DISCUSSION OF THE USACE UAS (UNMANNED AIR SYSTEM) PROGRAM

Presentation will contain a brief history of the U.S. Army Corps of Engineers’ Unmanned Air System (UAS) Program with an emphasis on using the UAS to obtain high resolution geo-referenced imagery to monitor and map vegetation in aquatic and terrestrial environments. These data have been used to monitor invasive plants, but there are many applications, including wildlife monitoring.

MANAGEMENT OF EXOTIC WILDLIFE OF FLORIDA (SYMPOSIUM)

Florida’s receptive climate and long history of importation and culture of exotic fish and wildlife have led to the introduction of over 500 nonnative species. The Florida Fish and Wildlife Conservation Commission (FWC) considers at least 125 of these introduced species to be established, i.e., consistently reproducing and unlikely to be extirpated by humans or natural causes. Despite a relatively high rate of establishment, the majority of introduced species have not resulted in adverse environmental, economic, and human health and safety impacts to native wildlife or their habitats. FWC has dealt with nonnative species issues for over 50 years, primarily through the assessment and management of exotic freshwater fishes and regulations for captive wildlife. First and foremost, FWC strives to prevent the unauthorized introduction of non-native fish and wildlife through regulations and outreach. For established or recently released species, FWC has adopted a risk-based management approach, with control efforts commensurate with potential adverse impacts. Therefore, rapid and long term assessments are a critical component of nonnative species management. The Exotic Species Coordination Section (ESC) was created in 2004 to broaden FWC’s involvement with introduced species. ESC activities cover five main areas: prevention, early detection, rapid response, control/management, and education/outreach. Management may include attempting eradication, containment, removal from particularly sensitive areas, or no action. ESC has 8.5 FTE, and an operating budget of approximately $300,000, including grants. More funding is needed in all areas to implement effective surveys and removal programs. Priority species include Gambian pouched rats, Northern African pythons, Nile monitors, iguanas, Burmese pythons, purple swamphens and red lionfish.
BAITING THE NINE-BANDED ARMADILLO (POSTER)

The nine-banded armadillo (*Dasypus novemcinctus*) is considered an invasive species in Florida. Management is difficult because no repellents, toxicants, or fumigants are currently registered for this species; exclusion is laborious because armadillos are adept burrowers; and no effective trapping attractants have been identified. A suitable lure could conceivably increase trap capture success, which would likely decrease the frequency of nuisance complaints received by wildlife managers and extension personnel. We compared the behavioral attractiveness to captive armadillos of 16 commercially available food materials, as well as scents collected from conspecifics. We used information from 28 individual animals collected over the course of 202 trials to assess the relative potential of test materials to function as lures, using 3 distinct behavioral measures (time to first contact, number of attraction events, and duration of interest). Four materials consistently elicited the greatest attraction responses from armadillos: pond worms (*Lumbricus terrestris*), crickets (*Acheta domestica*), red worms (*Eisenia fetida*), and wigglers (*Pheretima hawayanus*). Recognizing that all of these materials were live prey, we devised a second series of experiments to evaluate the relative importance of olfactory cues versus auditory–vibrational cues in evoking a response from armadillos. Results suggested auditory–vibrational cues were meaningful. Finally, we measured sound pressure and vibration levels produced by the most preferred and less preferred prey items. Sound and vibrational cues decreased rapidly within 10–30 cm from baits. Because of this, and because the perceptual range of armadillos to the olfactory cues from these baits appears limited, we believe the development of an effective baiting system will require further investigation into the possibility of enhancing the ability of stimuli to travel over long distances. Future research should be directed either toward development of repellents, toxicants, or other exclusion techniques, or else toward development of enhanced stimuli capable of travel over long distances.

CAN NOVEL WEAPONS FAVOR NATIVE PLANTS? ALLELOPATHIC INTERACTIONS BETWEEN *MORELLA CERIFERA* (L.) AND *SCHINUS TEREBINTHIFOLIUS* RADDI

Potential allelopathic effects of wax myrtle, *Morella cerifera* (L.), to Brazilian peppertree, *Schinus terebinthifolius* Raddi, were investigated in laboratory and field studies. Aqueous leaf extracts of wax myrtle suppressed germination and reduced seedling growth and survival of Brazilian peppertree. Similarly, root washings of wax myrtle negatively affected germination, growth, and biomass accumulation of Brazilian peppertree. In field plots planted with equal densities of wax myrtle and Brazilian peppertree saplings, no differences in final densities, growth, or vigor between the two species were detected after 14 months, suggesting that neither species was competitively superior to the other. Based on the results of this study, wax myrtle may have value as one tool in an integrated approach to management of Brazilian peppertree, but additional research is required to demonstrate allelopathic effects in the field.
Establishment of a breeding population of Argentine black and white tegus (*Tupinambis merianae*) has been documented by partners of the Everglades Cooperative Invasive Species Management Area (Everglades CISMA) in Miami-Dade County. Beginning in 2008, numerous observations of tegu lizards in the Florida City area led Everglades CISMA to attempt a rapid response to the newly discovered population, to delimit the expansion of tegus and evaluate their potential ecological impact upon the Everglades ecosystem. The rapid response effort included systematic surveys by vehicle and foot, mapping using GPS and EDDMapS, the establishment of a camera trap grid, the development of a live trapping program, and a radio telemetry study. A gut content analysis was also conducted, using collected specimens. The radio telemetry study focused on five live-trapped adult tegus (sex ratio 3:2) that were surgically implanted with radio transmitters and their movements monitored between August 2010 and June 2011. Radio telemetry locations for all five transmittered tegus showed a marked decrease in movements between November 2010 and February 2011, reflecting the brumation period typical of the species in its native range in subtropical and temperate South America. In late February 2011, all five tegus began making wider movements. The three males T-1, T-4, and T-5 made more frequent and longer range movements than did the two females T-2 and T-3, which remained fairly close to their dormant season refugia. T-2 was originally captured in a live trap on September 9, 2010. A radio transmitter was surgically implanted on September 30, 2010, and she was released at the trap site on October 4, 2010. A total of 36 radio-telemetry locations was recorded for T-2, including 16 within a ruderal thicket dominated by exotic plants, where the first tegu nest to be described in Florida was eventually located and excavated on June 9, 2011. The Everglades Cooperative Invasive Species Management Area was created to formalize cooperation among land management agencies to improve the effectiveness of exotic species control by sharing resources across borders through a memorandum of understanding with the goal of helping to ensure the success of the Comprehensive Everglades Restoration Plan.

**USING THE I’VE GOT ONE APP FOR SMARTPHONES**

Collecting data on invasive species can provide up to date distribution data and maps, which is a key element in planning effective and efficient management strategies for invasive species. The data collected uploads to the Early Detection & Distribution Mapping System (EDDMapS). Data uploaded to EDDMapS can be downloaded to an Excel or .kml file. This allows you to choose the specific data you need and makes it easy to add it as a layer in a GIS project. Data collection can be costly in both human and financial resources at a time when both are in short supply. New technology is providing the opportunity for anyone with a smartphone to quickly and easily collect, upload, and share data on invasive species. Information collected includes GPS coordinates, species, date, description of infestation, and images.
Not only can land managers and other professionals more quickly and easily collect data using a smartphone, volunteers can easily learn to use it too. Learn how to download the I’ve Got One app to your smartphone. Learn how to enter data with your smartphone. Whether you have an iPhone or Android you can quickly and easily collect and upload data on invasive species.

FINDING OVERLAP BETWEEN CISMA GOALS AND PRIVATE LANDOWNER BENEFITS: EXPERIENCES FROM THE TREASURE COAST

The Treasure Coast Cooperative Invasive Species Management Area (TC CISMA) has been working with private landowners since its beginning in 2007. TC CISMA’s experience with private landowners has been very diverse, mirroring our landscape including: small residential properties, small and large ranches, a utility company preserve, condominium associations’ lands, environmental non-profit lands, and a large Boy Scouts of America (BSA) camp. TC CISMA initially focused private land efforts on a priority coastal control species, beach naupaka (Scaevola taccada), and a priority Early Detection Rapid Response (EDRR) species, Chinese tallow tree (Sapium sebiferum). The efforts to target scaevola led to work on residential and condominium sites adjacent to excellent conservation lands. This work was slow and time consuming, but supported our regional goals with this species. Our outreach efforts with tallow led to work on a small ranch. This rancher identified all the tallow in and around his land, then coordinated the removal with TC CISMA. TC CISMA has had opportunities arise to work on strategic private lands even with invasive species that were not yet our focus. For example, the BSA camp did not have our targeted species, but was a high quality property with enthusiastic partners and was adjacent to a significant public conservation land. Another opportunity was working on a utility company’s private swamp. The invasives targeted in this case were common, and not EDRR species, and probably not priority control species. Nevertheless, the opportunity to work with this partner, even indirectly through a non-profit, was viewed as an opportunity, and a task that was already identified in TC CISMA’s 5-year strategic plan. TC CISMA’s success can be attributed to helping private landowners realize a significant benefit for treating invasives, and CISMA members have been flexible and opportunistic. Private landowners’ motivation usually is based on their land management gain, instead of a specific job task or conceptual CISMA goal. For example, partnering with cattle ranchers was successful because tallow and Brazilian pepper (Schinus terebinthifolius) invaded fencelines, causing fence damage. And ocean-side landowners were more likely to treat beach naupaka when they realized the benefit of increasing dune stability.

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EFFECTS OF HERBICIDE APPLICATION AND PROLONGED FLOODING ON PARA GRASS

In 2007, Florida Fish and Wildlife Conservation Commission (Commission) biologists began monitoring the effects of para grass (*Urochloa mutica*) management on the T. M. Goodwin Waterfowl Management Area (WMA) in southern Brevard County. Para grass, listed as a Category I invasive plant by the Florida Exotic Pest Plant Council, is a highly invasive exotic grass common in shallow wetlands and shorelines of central and south Florida. Historically, the WMA was diked and drained for cattle production and seeded with forage grasses such as para grass, bahia grass (*Paspalum notatum*) and Bermuda grass (*Cynodon spp.*) in the 1970’s. Expansion of para grass occurred after cattle were removed from the site following acquisition of the property in 1988 using state Save our Rivers Program funds. This expansion degraded valuable palustrine emergent marsh habitat, including native annual seed producing plants attractive for waterfowl and other wetland wildlife. To study the effects of management activities on para grass, FWC staff selected Goodwin impoundment #5 (40 ha surface area) as the study site. Management included application of herbicide (glyphosate) in December 2007 followed by flooding (>0.5 m water depth) from 2008 to 2012. Research monitoring included point-transect sampling along three fixed line transects to determine percent frequency of occurrence for para grass, open water, and other vegetation. Prior to management, frequency of para grass was 68-93% (mean 82%) on the three transects. One year after management, para grass frequency declined to 2-24% (mean 10%). Annual sampling over the subsequent three years confirmed long term control, as para grass frequency was 0-11% (mean 1-5%). Mean combined frequency of open water and submersed aquatic vegetation increased from 8% before management to 41% in October 2011. Previous observations and monitoring by Commission staff indicate that the benefits of herbicide treatment alone were limited to two or three years at best. The management strategy of herbicide treatment followed by prolonged flooding of para grass appears to be an effective control treatment on the WMA.

LIVE VERTEBRATE TRADE: HISTORY AND IMPLICATIONS FOR POLICY AND MANAGEMENT OF NONINDIGENOUS SPECIES (PLENARY)

Wildlife trade is an important economic activity that brings thousands of nonindigenous species to the United States. Although most imported species generate net economic benefits, a subset escape, establish breeding populations, and cause serious economic and environmental harm. Currently, the United States does not take a strong, proactive approach to managing the importation of live nonindigenous organisms, and as a result, the number of invasive species introduced through this medium continues to increase. For vertebrates, this trade in live specimens is the most important pathway leading to invasions. Managing the introduction of species through trade is becoming a major goal of policy-makers at regional, national, and international scales. To accomplish this goal, the development of effective and accurate risk assessment tools is necessary.
I will present a synthetic review of US trade in live vertebrates over 30 years and its contribution to the invasion process, the utility of these data for invasion research and related policy, and an overview of expected net benefits of a risk assessment program for evaluating the importation of nonindigenous species.

THE EFFECTS OF HYDROLOGY ON NODULATION AND NITROGEN FIXATION IN THE INVASIVE PLANT, CATCLAW MIMOSA (MIMOSA PIGRA) (STUDENT POSTER)

*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 and nitrogen fixation in *M. pigra* has important implications for management of this invasive plant in natural wetlands and water treatment areas. In this study we are examining the effects of different water levels on nodulation and nitrogen fixation. A total of 100 seedlings are being grown from *M. pigra* seeds collected at invaded sites in Palm Beach County, including the Loxahatchee River Natural Area. An additional 100 plants of the closely related native species, *M. quadrivalvis*, will be grown from seedlings collected at or near sites where *M. pigra* is found. When average plant heights reach 8-10 cm, stem height of all plants is measured and 8 plants are harvested to determine above-ground and below-ground biomass. Each plant is randomly assigned to one of four treatment groups: drained, low, intermediate, or inundated. At 6 weeks the stem-length is again measured. Plants are then harvested and the roots are assayed for nitrogen fixation by the acetylene reduction method (Hardy et al. 1973) and the number, size, and location of root nodules is determined by light microscopy. Plant growth rates and treatment effects will be analyzed using standard general linear model procedures (SAS v9.2).
BRINGING COOPERATIVE INVASIVE SPECIES MANAGEMENT AREAS (CISMAS) TO THE MILITARY IN FLORIDA

For 3 years, The Nature Conservancy has worked with installations in Florida through the Department of Defense (DoD) Legacy Natural Resource Program funding to establish and strengthen 6 Cooperative Invasive Species Management Areas (CISMAs) to reduce re-infestation from invasive species on Eglin Air Force Base (AFB), Tyndall AFB, Camp Blanding Army National Guard, Avon Park Air Force Range, Cape Canaveral Air Force Station/ Patrick AFB, and Navy Air Station Key West. Invasives have been identified on all of these bases as both ecological and economic threats. Effective actions for addressing the threat of invasive species must occur at many levels within agencies and on the ground. Preventing the occurrence of new introductions has now been proposed to be the most effective and efficient approach. Once an invasive species begins to establish in a location, early detection and rapid response efforts must occur to preclude development of large infestations. Achieving success with this approach requires communication and cooperation across boundaries and fencelines, as well as creating effective regional partnerships. This partnership approach is the foundation of the development of CISMAs. CISMAs can effectively work on both private and public lands, buffering DoD installations from the invasive species threats beyond their boundaries. For this project, well-established and newly created partnerships were used for successful, far reaching projects to give unified messages, work across boundaries, pool limited resources and demonstrate how DoD could benefit from and assist CISMAs. These types of partnerships will assure range sustainment and mission flexibility for DoD in one of the fastest growing regions in the US. This project also leveraged statewide support for CISMAs through the Florida Invasive Species Partnership (FISP).

FERAL HOG MANAGEMENT WITHIN FLORIDA STATE PARKS

Feral hog management within Florida State Parks has demanded an adaptive and sensitive approach to balance the need to protect natural and cultural resources while still providing quality public resource based recreation. In the previous 10 years more than 27,500 feral hogs have been removed from over 66 state parks. During this timeframe both the number of state parks removing feral hogs and the total number of feral hogs removed has increased by more than 100%. Traditional tools accomplish only mediocre success, while the public has demanded both increased management and humane treatment. Removal tools have included shooting, trapping, and occasionally dogs. Work is conducted by a combination of staff, volunteers, private contractors, and other governmental assistance. Success has not yet been achieved and the staff of the Florida Park Service continues to seek ways to improve feral hog management.
THE CORPS’ EARLY DETECTION, RAPID RESPONSE EFFORT – Tamarix canariensis in Northern Florida

The US Army Corps of Engineers has been leading an Early Detection, Rapid Response (EDRR) effort to eradicate Tamarix canariensis (salt cedar) in Northeast Florida. In 2008, salt cedar was discovered on Buck Island, a dredge disposal site adjacent to the Fort Caroline National Monument. This was the first time that salt cedar had been documented as being invasive in Florida. Subsequent surveys have revealed that salt cedar has invaded nine dredge material management areas (DMMAs) along the St. Johns River and the Intracoastal Waterway. To date, eight of the nine DMMAs have received repeated control treatments. Treatments have begun on the final site, but due to lack of funding, the initial treatment has not been completed. The presentation will provide an overview of the species, including identifying characteristics and a brief natural history. It will also describe the efforts involved with the treatments and monitoring of the infested sites in the Northeast Florida area.

Cricotopus lebetis (Diptera: Chironomidae), A Fortuitous Biological Control Agent of Hydrilla (Student)

A chironomid midge, Cricotopus lebetis Sublette (Diptera: Chironomidae), was discovered attacking hydrilla in Crystal River, Citrus Co., Florida in the 1990s, and may be a recent introduction into Florida. Larvae of the midge mine in the apical meristems of hydrilla, causing basal branching and stunting of the plant. We investigated the distribution, biology, and host range of the midge. The midge was found in a few Florida water bodies, but it was not often abundant. Survey and water quality data were collected from several different water bodies in Florida, and data were correlated to the abundance of the midge. The relationship of temperature to developmental biology of the midge revealed that development was highest at temperatures between 20 and 30°C, and increased with increasing temperature. Host range studies showed that C. lebetis completed development on hydrilla and several other aquatic plants. Additional host range tests were conducted to see if C. lebetis showed preference to certain host plants. Adult oviposition tests were conducted to determine if females prefer to lay eggs in water containing host plants. Host finding behavioral tests were also conducted to determine the searching behavior of C. lebetis when locating a host. The results of these studies will be used to assess the potential of C. lebetis as a biological control agent of hydrilla.

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SPATIAL INVASIVES INFESTATION AND THREAT ANALYSIS MODEL AND MAP (POSTER)

The Nature Conservancy’s Site Weed Management Plan Template includes a great tool for prioritizing the risk posed by invasives 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 ED/RR 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 Threat Analysis” model also considers the habitat(s) in which and around where the invasive population occurs and the likelihood the invasive will spread into that habitat; whether successful control measures have been established for this species; and the effort required to follow the measures. 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.”

EFFECT OF JAPANESE CLIMBING FERN INVASION ON NATIVE PLANT DIVERSITY AND HABITAT QUALITY IN PINE UPLANDS (STUDENT)

_**Lygodium japonicum**_ (Japanese climbing fern) is an exotic, invasive vine that has become a problem in forests of the southeastern United States. Typically starting as a few scattered individuals, invasions of Japanese climbing fern can escalate into dense, tangled masses that overtop trees, smother understory vegetation, and alter fire behavior. Because of the economic implications of _L. japonicum_ invasions on pine plantations, most research on the fern has focused on control. However, much about its impact on natural systems remains unknown, including its potential effect on plant biodiversity and habitat quality for small, granivorous wildlife. In this study, we compared understory community composition and structure for plots free of and invaded by _L. japonicum_ (10-90% cover) across three different upland pine stands. Twenty 3 x 3 m plots of both types were established at each site and evaluated for percent cover of four groundcover classes: _L. japonicum_, bare ground/litter, woody vegetation, and herbaceous vegetation.

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Two 1 x 1 m subplots were then randomly established within each larger plot and evaluated for species-level richness and evenness. Average species richness was actually higher in “invaded” than “free” plots for two of the sites (16 vs. 14 and 13 vs. 12 species), though the differences may be explained by the additional presence of invasive species in the invaded plots. At the third site, there were, on average, 20 species in free plots versus 17 in invaded plots. However, richness in invaded plots was inversely proportional to percent cover of L. japonicum and resulted in a loss of 1-4 species with each 25% increase in fern cover across all sites. The most abundant species varied substantially between sites and were 60-80% similar between paired plot types. The proportions of the most abundant species that are also important food plants for wildlife also varied greatly across sites and between plot types (S1: 77% in invaded vs. 47% in free; S2: 63% vs. 60%; S3: 31% vs. 64%). Given the correlation between fern cover and richness, it is likely that this species will impact wildlife food availability as cover increases significantly.

**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 US. 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, colleagues at the Australian biological control lab, and 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 US. The most promising and advanced species is the flea beetle *Bikasha collaris*. The no-choice testing of adults on 68 plant species indicates that egg deposition and adult feeding occur only on the target weed and a related plant not found in the US. 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 species, *Gadirta 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 US. Another insect, a new species of Tetrastichinae Eulophidae wasp, forms stem galls on tallow. These two species are being tested in China and both will be imported into quarantine during summer 2012.

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GREEN IGUANA PROLIFERATION IN THE KEY WEST NATIONAL WILDLIFE REFUGE: A BY-PRODUCT OF HURRICANE WILMA AND A THREAT TO THE IMPERILED MIAMI BLUE BUTTERFLY? (POSTER)

A neotropical folivore, the green iguana (Iguana iguana) is exotic to southern Florida, where it has few known predators. Limiting factors are poorly understood, but at high densities this reptile may threaten native wildlife, including the imperiled Miami blue butterfly (Cyclargus thomasi bethunebakeri). In 2011, iguana tracks and burrows were found in sandy uplands on 14 islands in the Key West National Wildlife Refuge, including all areas occupied by the Miami blue. Because gravid female iguanas shun densely shaded areas for nesting and move to more open settings to nest, hurricanes may create or maintain clearings favorable for iguana nesting. Here I suggest that Hurricane Wilma, the most severe Florida Keys hurricane since 1965, was a catalyst for iguana proliferation in the Key West National Wildlife Refuge. Until my study, the distribution of this reptile and its sympatry with the Miami blue in the Key West National Wildlife Refuge were unknown.

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