Southeast Exotic Pest Plant Council 10th Annual Symposium

Managing Invasive Plants in Disturbed Landscapes

Imperial Palace Casino, Resort, Spa
Biloxi, Mississippi
May 20-21, 2008

Hosted by:

Southeast Exotic Pest Plant Council

Mississippi Exotic Pest Plant Council

Sponsored by:
Mississippi Forestry Commission

Southeast Exotic Pest Plant Council
10th Annual Symposium

Managing Invasive Plants in Disturbed Landscapes

Hosted by the Mississippi Exotic Pest Plant Council

May 20-21, 2008
Imperial Palace Casino, Resort, Spa
Biloxi, Mississippi

Sponsored by
Mississippi Forestry Commission

AGENDA
Southeastern Exotic Pest Plant Council
10th Annual Symposium

Monday, May 19, 2008

4:00-6:00 pm, Registration, Ballroom Foyer. Silent auction items should be turned it at the registration desk.

6:00-7:00 pm, MS EPPC Conference Committee Meeting, Ballroom Foyer. (Meet initially at the registration desk)

Tuesday, May 20, 2008

7:30am-5:00pm, Registration, Ballroom Foyer. Silent auction items should be turned it at the registration desk.

7:00-9:00am, Exhibit and Poster setup, Ballroom B

9:00-5:00, Exhibit and poster viewing, Ballroom B

General Session, Ballroom A, Steven Brewer, Moderator

9:00-9:15: **GREETING FROM MS EPPC,** Steven Brewer.

9:15-9:20: **ANNOUNCEMENTS ON PROGRAM**, John Madsen.

9:20-9:40: **SE-EPPC AND CHAPTER UPDATES**, Tony Pernas and chapter representatives of SE-EPPC, AL-IPC, FL-EPPC, GA-EPPC, KY-EPPC, MS-EPPC, NC-EPPC, SC-EPPC, TN-EPPC

9:40-10:40: **KEYNOTE ADDRESS**: Lester Spell, D.V.M., Commissioner, Mississippi Department of Agriculture and Commerce

10:40: Break

11:00-11:20: **A COOPERATIVE WEED MANAGEMENT AREA FOR MISSISSIPPI AND OTHER ACTIVITIES.** Benny Graves, Mississippi Department of Agriculture and Commerce

11:20-11:40: **MISSISSIPPI FORESTRY COMMISSION'S EFFORTS WITH INVASIVE EXOTIC PLANTS**. Mike Lee and Ronnie Myers, Mississippi Forestry Commission

11:40-12:00: **AERIAL SKETCH MAPPING AND RELATED TECHNOLOGY ASSESSMENT TOOLS**. Allen Van Valkenberg, Mississippi Forestry Commission

12:00-1:00: Lunch (on your own)

Poster Viewing Session

1:00- 1:30: Poster session, Ballroom B. (*Authors, please stand by posters*)

Concurrent Session A: Management Programs. Ballroom A, James Copeland, Moderator

1:30-1:50: **ENGAGING VOLUNTEERS IN MANAGING INVASIVE PLANTS**, Newt Hardie, Kudzu Coalition, Spartanburg, SC

1:50-2:10: **SITE SPECIFIC CONSIDERATIONS**. Arthur E. Miller, Retired USDA-APHIS-PPQ Regional Program Manager, Raleigh, NC, and Nancy Fraley, Liaison, SE Exotic Plant Management Team, National Park Service, Asheville NC

2:10-2:30: **MISSISSIPPI FIELD TRIAL OF KUDZU CONTROL STRATEGIES**. M.A. Weaver, W.T. Molin, C.D. Boyette, and R.E. Hoagland, USDA ARS Southern Weed Science Research Unit, Stoneville, MS

2:30-2:50: **COMPARISON OF SUBSURFACE AND FOLIAR HERBICIDE APPLICATIONS FOR CONTROL OF PARROTFEATHER (*MYRIOPHYLLUM AQUATICUM* VELL. VERDC.).** Ryan M. Wersal and John D. Madsen; GeoResources Institute, Mississippi State University, Starkville, MS

2:50-3:10: **MANAGING INVASIVE PLANTS IN THE URBAN /RURAL INTERFACE: MY OWN CREEK BOTTOM.** Jimmie Cobb, Sales Specialist, Dow AgroSciences. AL Registered Forester, Certified Arborist, Utility Specialist

3:10-3:30: **COGONGRASS (*IMPERATA CYLINDRICA* (L.) BEAUV.) RESPONSE TO HERBICIDE TREATMENTS AND SUBSEQUENT SPECIES COMPOSITION ASSESSMENTS ON CAMP SHELBY JOINT FORCES TRAINING CENTER, MS.** Lyman, Melinda R.[1], Lisa Y. Yager[2]. [1]The Nature Conservancy Camp Shelby Field Office. [2]Mississippi Museum of Natural Science

3:30-3:50. Break in Ballroom B

3:50-4:10: **GEORGIA'S COGONGRASS EFFORTS: MANAGING COGONGRASS IN DISTURBED LANDSCAPES.** Mark McClure, Georgia Forestry Commission

4:10-4:50: **OVERVIEW AND UPDATE ON ESTABLISHMENT OF STATE EDRR COORDINATING COMMITTEES IN SUPPORT OF THE NATIONAL EARLY DETECTION AND RAPID RESPONSE SYSTEM FOR INVASIVE PLANTS.** Randy G. Westbrooks, USGS BRD, Whiteville, NC; Robin Mackie, USDA Forest Service, Columbia, SC; John D. Madsen, Mississippi State University; and Leslie J. Mehrhoff, University of Connecticut

4:50: Session Ends

Concurrent Session B: Ecology. Ballroom C, Donna Beliech, Moderator

1:30-1:50: **UPDATE ON THE BIOLOGY AND DISPERSAL OF DEEPROOT SEDGE (*CYPERUS ENTRERIANUS*)**. Charles T. Bryson, USDA-ARS, Southern Weed Science Research Unit, Stoneville, MS, Richard Carter, Biology Department, Valdosta State University, Valdosta, GA, and David J. Rosen, US Fish & Wildlife Service, Houston, TX

1:50-2:10: **DOES *MICROSTEGIUM VIMINEUM* REDUCE NATIVE PLANT DIVERSITY AT PRODUCTIVE SITES? RESULTS OF A PATH ANALYSIS.** J. Stephen Brewer, Associate Professor of Biology, University of Mississippi, Oxford, MS

2:10-2:30: **EVALUATION OF EXOTIC INVASIVE PLANTS ON FOREST COMPOSITION, STRUCTURE, AND WILDLIFE HABITAT ON PRIVATE WOODLANDS OF VIRGINIA.** Dawn Aksamit and Shepard Zedaker. Department of Forestry, Virginia Tech, Blacksburg, VA

2:30-2:50: **SEED GERMINATION OF SELECTED MAIDENGRASS (*MISCANTHUS* SPP.) CULTIVARS AND VARIETIES.** Victor Maddox, GeoResources Institute, Mississippi State University, John Byrd, Plant and Soil Sciences, Mississippi State University, John Madsen, GeoResources Institute, Mississippi State University, Starkville, MS, and Randy Westbrooks, United States Geological Survey, Whiteville, NC

2:50-3:10: **CURRENT DISTRIBUTION OF GIANT SALVINIA AND HYDRILLA IN MISSISSIPPI: THREE YEARS SURVEYING.** Wilfredo Robles, John D. Madsen, Victor L. Maddox, and Ryan M. Wersal, GeoResources Institute, Mississippi State University

3:10-3:30: **INVASION OF THE EXOTIC *PAULOWNIA TOMENTOSA* AT LINVILLE GORGE AND CHANGES IN ITS HABITAT DISTRIBUTION OVER TIME.** Dane M. Kuppinger, University of the South, Sewanee, TN

3:30-3:50. Break in Ballroom B

3:50-4:10: **ROLE OF NATURAL AND ANTHROPOGENIC DISTURBANCE IN EXOTIC INVASIONS: PREDICTING INVASION DYNAMICS OF *LYGODIUM JAPONICUM* USING ECOLOGICAL NICHE MODELING.** Nitesh Tripathi and Shibu Jose, School of Forest Resources and Conservation, University of Florida, Gainesville, FL

4:10-4:30: **ACCELERATED DECOMPOSITION RATES BY *IMPERATA CYLINDRICA* IN SOUTHERN MISSISSIPPI ARE CORRELATED WITH MICROBIAL COMMUNITY STRUCTURE AND FUNCTION.** D. Christopher Holly[1], Gary N. Ervin[1], Colin R. Jackson[2], Susan V. Diehl[3], Grant T. Kirker[3], [1]Department of Biological Sciences, Mississippi State University, [2]Department of Biology, The University of Mississippi, [3]Department of Forest Products, Mississippi State University

4:30-4:50: **COMMON REED: *PHRAGMITES AUSTRALIS* (CAV.) TRIN. EX STEUD: LIFE HISTORY IN THE MOBILE RIVER DELTA, ALABAMA.** Joshua C. Cheshier and John D. Madsen, GeoResources Institute, Mississippi State University, Starkville, MS

4:50: Session Ends

Concurrent Session C: Databases and Volunteer Programs (Please note that these talks are 30 minutes), Ballroom D, Jean Freeney, Moderator

1:30-2:00: **EDDMAPS – INVASIVE SPECIES MAPPING APPLICATIONS AND ENHANCEMENTS**, Charles T. Bargeron, David J. Moorhead, Carey Minteer, G. Keith Douce, and Joe LaForest. The University of Georgia, Tifton, GA

2:00-2:30: **THE INVASIVE PLANT ATLAS OF THE MIDSOUTH (IPAMS).** Clifton Abbott, Victor Maddox, Gary Ervin, and John Madsen, GeoResources Institute, Mississippi State University, Starkville, MS

2:30-3:00: **SOUTHEAST COLLABORATION AND PARTNERSHIP COMMUNITY – A WEB-BASED TOOL SUPPORTING CONSERVATION INITIATIVES IN THE SOUTHEAST.** S. Jean Freeney, NBII-SAIN, and Terri Killeffer, IIa/NBII-SAIN

3:00-3:30: **CACTUS MOTH DETECTION NETWORK**. John D. Madsen, Richard L. Brown, Gary N. Ervin, Victor L. Maddox, and Clifton F. Abbott, GeoResources Institute, Mississippi State University

3:30-4:00. Break in Ballroom B

4:00-5:00. **DATABASE ROUNDTABLE DISCUSSION** (Discussion led by Jean Freeney)

5:00: Adjourn Session

Dinner on your own

Reception, 8:00-10:00pm, Ballroom B

During the reception, you will have the opportunity to view posters and exhibits. Poster authors and exhibitors are asked to attend the reception and be available for discussion, though you do not have to stand by your exhibit or poster.

Our ***silent auction*** will also take place during the reception. The reception will be the only time during which you may bid on silent auction items. Silent auction donors are asked to submit their items at the registration desk when they register.

Poster Presentations

Poster authors will be available from 1:-- to 1:30 on Tuesday May 20 in Ballroom B. Posters can be viewed all day Tuesday and Wednesday

1. **THE FORT BRAGG NON-NATIVE INVASIVE PLANT MANAGEMENT PROGRAM** Peter Frank, Chicago, IL; Matthew Hohmann, US Army Corps of Engineers ERDC-CERL; and Janet Bracey Gray, Endangered Species Branch, Fort Bragg, NC

2. **INTEGRATIVE DECISION MAKING TO OPTIMIZE NATURAL RESOURCE MANAGEMENT: A NON-NATIVE INVASIVE PLANT MANAGEMENT PRIORITIZATION EXAMPLE** Matthew Hohmann, US Army Corps of Engineers ERDC-CERL, Champaign, IL; and Peter Frank, Chicago, IL

3. **THE NORTH CAROLINA SANDHILLS WEED MANAGEMENT AREA: FACILITATING REGIONAL, INVASIVE PLANT MANAGEMENT PARTNERSHIPS AMONG NEIGHBORING LAND STEWARDS.** North Carolina Sandhills Weed Management Area, Southern Pines, NC

4. **ASSESSING HERBICIDE EFFICACY AND AQUATIC PLANT COMMUNITY CHANGES IN THE ROSS BARNETT RESERVOIR, MS.** Wersal, R.M[1], J.D. Madsen[1] and M.L. Tagert[2]; [1]GeoResouces Institute, Mississippi State University, Starkville, MS, [2]Mississippi Water Resources Research Institute, Mississippi State University, Starkville, MS

5. **COMPARISON OF IMAZAPYR AND IMAZAMOX FOR CONTROL OF PARROTFEATHER (*MYRIOPHYLLUM AQUATICUM* (VELL.) VERDC.).** Wersal, R.M and J.D. Madsen; GeoResources Institute, Mississippi State University, Starkville, MS

6. **RELATIVE IMPORTANCE OF PROPAGULE PRESSURE, LIGHT AVAILABILITY, AND NUTRIENT CONCENTRATION UPON THE ESTABLISHMENT AND PHYSIOLOGY OF A MODEL INVASIVE SPECIES, *IMPERATA CYLINDRICA*.** D. Christopher Holly and Gary N. Ervin, Department of Biological Sciences, Starkville, MS

7. **CHARACTERIZATION AND QUANTITATIVE ASSESSMENT OF A POTENTIAL RHIZOME-MEDIATED ROOT DISTURBANCE MECHANISM IN COGONGRASS.** D. Christopher Holly and Gary N. Ervin, Department of Biological Sciences, Mississippi State University, Starkville, MS

8. **DRAFT EXOTIC PLANT LIST FOR MISSISSIPPI AND REQUEST FOR INPUT.** Gary N. Ervin, Mississippi Exotic Plant Species List Committee

9. **DIGITAL GROWTH OF COMMON REED (*PHRAGMITES AUSTRALIS* (CAV.) TRIN. EX STEUD).** Joshua C. Cheshier and John D. Madsen, GeoResources Institute, Mississippi State University, Starkville, MS, and David F. Spencer, USDA-ARS, Davis, CA

10. **SEASONAL BIOMASS DETECTION OF WATERHYACINTH USING NORMALIZED DIFFERENCE VEGETATION INDEX DERIVED FROM LANDSAT 5 TM SIMULATED DATA.** Wilfredo Robles and John D. Madsen, Mississippi State University, GeoResources Institute, Starkville, MS

11. **PRICKLY NIGHTSHADES (SOLANUM: SOLANACEAE) FOUND IN THE SOUTHEASTERN UNITED STATES (2 PANELS)**. Charles R. Bryson, USDA-ARS

12. **BROWN FLATSEDGE (*CYPERUS FUSCUS*): A POTENTIAL RICE WEED.** C. T. Bryson and R. Carter, USDA-ARS, Southern Weed Science Research Unit, Stoneville, MS, and Department of Biology, Valdosta State University, Valdosta, GA

Wednesday, May 21, 2008

General Session, Ballroom C, Charles Bryson, Moderator

9:00-9:10: **ANNOUNCEMENTS**, John Madsen

9:10-9:30: **SOUTHEAST EXOTIC PEST PLANT COUNCIL WEBPAGE UPDATE**, Chuck Bargeron, University of Georgia

9:30-9:50: ***WILDLAND WEEDS* UPDATE**, Karen Brown, University of Florida

9:50-10:40: **INVITED PLENARY SPEAKER: CONCEPTUAL FRAMEWORK FOR A BIOLOGICAL PROTECTION ETHIC ON THE INTRODUCTION, USE, AND SPREAD OF EXOTIC PLANTS AND ANIMALS IN THE UNITED STATES.** Randy G. Westbrooks, USGS BRD, Whiteville, NC; John D. Madsen, Mississippi State University, Starkville, MS; and Leslie J. Mehrhoff, University of Connecticut, Storrs, CT

10:40-11:00: Break

11:00-11:40: **INVITED PLENARY SPEAKER: NATIONAL BIOLOGICAL INFORMATION INFRASTRUCTURE – BUILDING KNOWLEDGE THROUGH PARTNERSHIPS.** S. Jean Freeney, NBII-SAIN, and Terri Killeffer, IIa/NBII-SAIN

11:40-12:00: **COGONGRASS RESEARCH IN MISSISSIPPI**. John D. Byrd, Jr., Mississippi State University, Mississippi State, MS

12:00-1:30: Lunch on your own

General Session, Ballroom D, Kenneth Calcote, Moderator

1:30-1:50: **CENTER FOR INVASIVE SPECIES AND ECOSYSTEM HEALTH.** David J. Moorhead, G. Keith Douce, Charles T. Bargeron, Carey Minteer, and Joe LaForest; The University of Georgia, Tifton, Georgia

1:50. **SYNTHESIS OF THE COGONGRASS REGIONAL CONFERENCE: WHAT WE LEARNED AND WHAT WE NEED TO KNOW.** James H. Miller, Invasive Species Researcher and Affiliate Professor, USDA Forest Service R&D, Auburn University, AL and Nancy J. Loewenstein, Auburn University School of Forestry and Wildlife Sciences and Alabama Cooperative Extension System

2:10-2:30: **DEVELOPING AN EXOTIC PLANT LIST FOR MISSISSIPPI**. Gary N. Ervin, Department of Biological Sciences, Mississippi State University, Mississippi State, MS and the Mississippi Exotic Plant Species List Committee

2:30-3:10: **INVASIVE NON-NATIVE PLANTS AND URBAN FORESTS IN THE SOUTHEAST.** Connie Gray, Natural Areas Consultant, Atlanta, GA

3:10-3:30: **MONITORING NON-NATIVE PLANT POPULATIONS IN THE ROSS BARNETT RESERVOIR, MS** Ryan M. Wersal[1], J.D. Madsen[1] and M.L. Tagert[2]; [1]GeoResouces Institute, Mississippi State University, Starkville, MS, [2] Mississippi Water Resources Research Institute, Mississippi State University, Starkville, MS

3:30-3:50: Break

3:50-4:10: **APHIS PLANT PEST ACTIVITIES IN MISSISSIPPI.** John Corban, USDA APHIS PPQ, Starkville, MS

4:10-4:30: **CONTROL OF JAPANESE CLIMBING FERN AND EFFECTS TO NON-TARGET VEGETATION FOLLOWING HERBICIDE APPLICATION IN TWO PINE STANDS DISTURBED BY HURRICANES.** Kimberly K. Bohn[1], Patrick J. Minogue[2], Anna Osieka[2], and Justin McKeithen[1], [1]University of Florida, West Florida Research and Education Center, Milton, FL; [2]University of Florida, North Florida Research and Education Center, Quincy, FL

4:30-4:50:

4:50: Adjourn

5:00-7:00: Takedown for displays, exhibits, poster presentations, Ballroom B

Dinner on Your Own

Thursday, May 22, 2008

Tours. You have a choice of one of three tours. Sign up when you register. A limited number of seats for a given tour may be available at the time of the meeting. A sign-up for those limited seats will be at the registration desk. All tours leave at 9am and will return in the mid- to late afternoon. Box lunches and a limited selection of beverages will be included. Tour attendees should plan on riding in the tour van.

Tour 1. Cogongrass Management Tour, Dr. John D. Byrd, Leader. Visit sites of ongoing cogongrass management in Mississippi and discuss the relative merits of the management practices involved. Cost $15.

Tour 2. Crosby Arboretum Tour, Dr. Stephen Brewer, Leader. Visit beautiful Crosby Arboretum to see native Mississippi plants and plant communities. Cost $15.

Tour 3. Pascagoula Swamp Tour, Ms. Patty Roger, Leader. Take a boat ride on the Pascagoula River to see bottomland wooded wetland communities (swamps), Cost $40.

Southeast Exotic Pest Plant Council 10th Annual Meeting

May 20-21, 2008
Biloxi, MS

KEYNOTE ADDRESS

Lester Spell, DVM, Commissioner, Mississippi Department of Agriculture and Commerce

Lester Spell is a sixth-generation Mississippian whose family has farmed and been in business in the state since the early 1800s. In 1979, Commissioner Spell married Sandra Dawson from Bolton. They had been married for twenty-four years when Sandra passed away in September 2003. Sandra was a former schoolteacher and was active in their family farm operation. Sandra's enthusiasm and outgoing personality were the inspiration for many landscape beautification projects in their community, on the Mississippi State Fairgrounds, and at the Mississippi Agricultural Museum in Jackson. Spell and his two children, Jason and Katie, currently live in Richland, Mississippi. Jason graduated from Mississippi College in December 2005 and Katie is presently in her second year of nursing school at Hinds Community College.

Growing up, Spell was very active in 4-H. This early interest led him first to Mississippi State for pre-veterinary studies and then to Auburn where he received his Doctorate of Veterinary Medicine in 1968. He then served two years as captain in the Army, supervising the inspection of perishable food shipped to Vietnam.

In 1970, Spell returned to Mississippi, beginning his veterinary practice and farming operation. In addition to raising blueberries, sweet corn, and pumpkins, he oversaw the family's timber and wildlife management programs.

In 1975, Spell became the first mayor of Richland, his hometown - a position he held until 1996 when he took office as Commissioner of Agriculture in January 1996. Under his leadership, Richland was incorporated and experienced phenomenal business and industrial growth. His experience and understanding of economic development enabled him to bring in many new businesses and create new jobs for area residents.

In November 1995, Spell was elected as the Commissioner of Agriculture and Commerce and was re-elected for a second term in 1999. In 2003, he was re-elected again and is now serving his third term in office. Spell is a member of the Republican Party and Mississippi's first Republican Commissioner of Agriculture and Commerce.

When Spell took office in January of 1996, the Department's budget was $1.2 million in the hole. Its office and records keeping systems and equipment were outdated. There were few computers in use and the Department still relied on pencils and pads with a filing system of some 300,000 index cards. The vehicles and other equipment were falling apart and repair costs were eating away at the budget. Also, the Department's productivity and morale were at a very low point.

Lester Spell quickly set to work. Tough decisions had to be made. Because of overspending before Spell took office, half the employees had to be furloughed and others laid off. Spell appointed a four-member Transition Team of well-respected, experienced individuals of various backgrounds to assist him in reviewing the Department and modernizing its operation and increasing its effectiveness and efficiency.

As a result of those reorganization efforts, the Department now has 33% fewer employees than when Spell took over. That was accomplished with cross training of employees, eliminating outdated and

unnecessary positions, reducing time consuming and unnecessary red tape, privatizing portions of the work, and introducing computer technology. Today, with 33% fewer employees, the Department's measurable work output is 20% higher than when Spell first came into office. This reorganization and increased efficiencies have resulted in a savings to the state of more than $34 million since 1996.

In 1996, he also became the Chairman of Keep Mississippi Beautiful program, a non-profit organization dedicated to making Mississippi a more beautiful state for residents and visitors to enjoy. In its major project, the "Avenue of Magnolias," magnolias are planted at major highway entrances and interchanges in Mississippi. In 2006 alone, more than 900 trees were planted through this program, which is funded by private donations.

In 1999, Spell introduced the “Make Mine Mississippi” program to identify and promote items that are grown or made in our state. Today, there are 976 companies in this program. This is the only program in the state that identifies and promotes Mississippi products.

Spell currently serves as chairman of the Mississippi Fair Commission and the Central Farmers Market Board. He serves on the boards of numerous agricultural and economic development organizations.

Lester Spell is a deacon and member of First Baptist Church in Jackson, where he has served as a Sunday school teacher and as an adult leader for the Boy Scout troop. Spell is a member of Plain Masonic Lodge.

He is past president of the Mississippi Municipal League, Mississippi Fruit and Vegetable Growers Association, the Rankin County Chamber of Commerce, and the Mississippi Veterinary Medical Association. Spell was selected as Mississippi Veterinarian of the Year in 1996, an award given by the Mississippi Veterinary Medical Association.

Mississippi agriculture and forestry earns approximately $6 billion annually in cash receipts, making it the state's largest business.

As Commissioner of Agriculture, Lester Spell believes in agriculture's potential to make a difference for every Mississippian by creating new markets and bringing money and new jobs to the state. "We have to move agriculture forward in the 21st century - to improve life for every Mississippian," he says.

Spell's background in agriculture, his training as a veterinarian, and his record in economic development give him a good perspective for service as Mississippi's Commissioner of Agriculture and Commerce.

(From the Mississippi Department of Agriculture and Commerce webpage, http://www.mdac.state.ms.us/n_library/misc/about_commissioner.html)

Abstracts

THE INVASIVE PLANT ATLAS OF THE MIDSOUTH (IPAMS). Clifton Abbott, Victor Maddox, Gary Ervin, and John Madsen, GeoResources Institute, Mississippi State University, Starkville, MS

The Invasive Plant Atlas of the MidSouth, or IPAMS, is a web-based database system designed to allow users to access and record information on invasive plant species and their locations. Additional information provided by IPAMS includes distribution maps, identification assistance, management and control techniques, and reporting information. Emphasis will be placed upon, but not limited to, invasive species populations within the MidSouth region. Data will be shared amongst other organizations as well as through the National Biological Information Infrastructure (NBII). The database will include numerous invasive plant species, although initial training workshops for non-scientists will focus on 40 invasive plant species. These 40 species represent six primary habitats: aquatic, managed forests, pasture, rights-of-way, row crop, and wildland areas. IPAMS utilizes field data protocols established by the North American Weed Management Association (NAWMA) and includes general information, GPS location information, and invasive plant species information. The IPAMS system provides tools for users to manage their data within the database. An alert notification system is also provided to allow interested parties to be notified when certain species are located within certain areas. IPAMS provides up-to-date distribution maps through an ArcIMS system. IPAMS will provide a single stop for the region for invasive plant locations, management methods, and reporting information so that individuals can effectively perform early detection and rapid response for invasive plant species threatening the landscape.

EVALUATION OF EXOTIC INVASIVE PLANTS ON FOREST COMPOSITION, STRUCTURE, AND WILDLIFE HABITAT ON PRIVATE WOODLANDS OF VIRGINIA. Dawn Aksamit and Shepard Zedaker, Department of Forestry, Virginia Tech, Blacksburg, VA

Exotic invasive plants have become a significant issue in the Southeastern United States for private landowners. These plants possess characteristics that allow for rapid growth and easy adaptation to many growing conditions, often outcompeting native vegetation and altering wildlife habitat, especially in disturbed areas. Man-made disturbances, such as access roads, trails, harvest sites, powerline corridors, and fence rows, are common on private land. Private landowners are often left to combat exotic invasive plant problems without many monetary or expertise resources that are available to federal lands. Three field sites, each in a different physiographic province in Virginia, were surveyed and sampled for exotic invasive populations using paired plots. Native species richness of the overstory and understory declined in invaded areas, but native percent understory cover and sapling density remained unchanged. Overstory tree density and forest basal area were reduced with presence of exotic invasive plants. Regeneration diversity and density decreased in areas of exotic plant invasion. Eastern cottontail habitat suitability increased with the presence of exotic invasive plants. Suitability of habitat for the gray squirrel, downy woodpecker food, black-capped chickadee reproduction, and eastern wild turkey cover declined with the occurrence of exotic invasive plants. In addition, sixty two percent of total invasive plots were within twenty feet of a disturbance area. Continual assessment of impacts will help provide a better understanding of the nature of exotic invasive plants to landowners and may help them to manage and prevent plant invasions.

SOUTHEAST EXOTIC PEST PLANT COUNCIL WEBPAGE UPDATE, Chuck Bargeron, University of Georgia

EDDMAPS – INVASIVE SPECIES MAPPING APPLICATIONS AND ENHANCEMENTS, Charles T. Bargeron, David J. Moorhead, Carey Minteer, G. Keith Douce, and Joe LaForest, University of Georgia, Tifton, GA

The University of Georgia's Bugwood Network has developed an Early Detection and Distribution Mapping System, or EDDMapS, to provide a more accurate picture of the distribution of invasive species. EDDMapS will allow land managers, agencies and others to set priorities for early detection and rapid response (EDRR), as well as formulate overall invasive plant management action plans. It was designed as a tool to develop more complete local, state and regional level distribution data of invasive species, identify "leading edge" ranges of new invasive threats, provide a means of implementing EDRR, and help corroborate threats and refine invasive species lists and management priorities. EDDMapS is currently in its third year of development and is being used by the Southeast EPPC, Florida EPPC, Georgia Cogongrass Task Force, and the Everglades Cooperative Invasive Species Management Area. This presentation will highlight new technical developments and applications by user groups.

CONTROL OF JAPANESE CLIMBING FERN AND EFFECTS TO NON-TARGET VEGETATION FOLLOWING HERBICIDE APPLICATION IN TWO PINE STANDS DISTURBED BY HURRICANES. Kimberly K. Bohn[1], Patrick J. Minogue[2], Anna Osieka[2], and Justin McKeithen[1]. [1]University of Florida, West Florida Research and Education Center, Milton, FL; [2]University of Florida, North Florida Research and Education Center, Quincy, FL

Japanese climbing fern (*Lygodium japonicum*) is a non-native, invasive vine with widespread occurrence along the Gulf Coastal Plain and known distributions through North Carolina. It first invades as scattered individuals, but reproduces prolifically from spores and revegetates from rhizomes. It can then form thick, tangled mats that deny growing space for ground vegetation and can overtop shrubs and trees. Herbicides can be an effective control measure for fern, but effects of those treatments on non-target vegetation can be a problem where fern intermingles with desired vegetation. This can be particularly problematic in restoration efforts where it is necessary to protect and promote remnant plants. The objective of this study was to evaluate the effect of herbicide applications on both the control Japanese climbing fern as well as the impact to non-target forest vegetation. We evaluated a naturally regenerated longleaf pine stand and a loblolly pine plantation that had been impacted by Hurricanes Dennis and Ivan. Japanese climbing fern covered or draped scattered woody regeneration, native herbaceous plants, and several early successional species that had established following the hurricane disturbances. Herbicide treatments included glyphosate, imazapyr, and metsulfuron methyl at three rates and in combination. We analyzed percent cover and crown reduction of Japanese climbing fern, other herbaceous vegetation, and woody regeneration before and after treatment. Phytotoxicity to woody stems was also recorded. Several herbicide treatments initially resulted in 80% or greater crown reduction of Japanese climbing fern, including the high rates of glyphosate alone, glyphosate in combination with imazapyr at low rates, glyphosate in combination with metsulfuron methyl at high

rates, and three way combinations. Metsulfuron applied alone was generally least injurious to associated non-target vegetation but not as effective at fern reduction. Small seedlings of woody plants draped in Japanese climbing fern were killed or injured significantly more when sprayed with glyphosate, imazapyr, and combinations of these herbicides. Because southern pine species are tolerant to the herbicide, fewer pine seedlings than hardwoods showed a phytotoxicity response to the imazapyr treatments. While there are several options for effectively controlling Japanese climbing fern abundance, at least on a short-term basis, the selection of which herbicide treatment to use will vary by forest type and site depending on the associated non-target species and the thickness or abundance of the fern.

DOES *MICROSTEGIUM VIMINEUM* REDUCE NATIVE PLANT DIVERSITY AT PRODUCTIVE SITES? RESULTS OF A PATH ANALYSIS. J. Stephen Brewer, Associate Professor of Biology, University of Mississippi, Oxford, MS

Displacement of native plant species by non-native species is generally thought to increase with increasing productivity. In some ecosystems, however, disturbances and productivity are positively correlated. Negative correlations between non-native and native species therefore could be caused in part by differences in how these species respond to disturbances. I used path analysis to investigate the possible impact of a non-native grass, *Microstegium vimineum*, on native plant communities in some young and mature hardwood forests on floodplains and terraces in north Mississippi. I established 125 3.14-m^2 circular plots along flooding and tree-canopy disturbance gradients within patches of varying density of *Microstegium*. Both *Microstegium* production and plant species richness were correlated with canopy gap fraction and flooding disturbance, with the most productive patches of *Microstegium* and the lowest richness occurring in sandy soils in periodically flooded depressions and canopy gaps. The best path model included direct negative effects of flooding and gaps on density-adjusted species richness (r = -0.53 and -0.20, respectively) and a direct positive effect of canopy gaps on *Microstegium* (r = 0.52). There was evidence of a direct negative effect of the most abundant species on *Microstegium* in mature stands. Most of this effect was attributable to a negative partial correlation between *Microstegium* and *Chasmanthium sessiliflorum* (r = -0.31). The effect of *Microstegium* on density-adjusted species richness was weak overall (r = -0.03), but it appeared to have a significant negative effect on species richness and mesic-forest indicators in young stands (r = -0.21). Microstegium production was not correlated with the abundance of rare species and positively correlated with that of disturbance and wetland indicators. Results suggest that *Microstegium* negatively affects some resident species in young stands, especially in canopy gaps, but its effect is small compared to the effect of flooding. In mature stands, negative correlations between *Microstegium* and species richness appear to result largely from differences in how these species respond directly to canopy gaps.

***WILDLAND WEEDS* UPDATE**, Karen Brown, University of Florida

UPDATE ON THE BIOLOGY AND DISPERSAL OF DEEPROOT SEDGE (*CYPERUS ENTRERIANUS*).
Charles T. Bryson, USDA-ARS, Southern Weed Science Research Unit, Stoneville, MS, Richard Carter, Biology Department, Valdosta State University, Valdosta, GA; and David J. Rosen, US Fish & Wildlife Service, Houston, TX

Deeproot sedge (*Cyperus entrerianus* Böckeler) is an aggressive, tenacious pest apparently introduced into the southeastern United States from temperate South America or Mexico. It is native to temperate regions of Argentina, Brazil, and Paraguay. Deeproot sedge can be identified by its robust growth form, deeply set short, thick, woody rhizomes, dark purplish black leaf bases, and glossy leaves. In the southern United States, it reproduces sexually by seeds and vegetatively from rhizomes. Plants of deeproot sedge are robust, fast growing, aggressive, and produce copious numbers of seed. The first extensive infestations were observed in 1989 in southwestern Louisiana and southeastern Texas along the Interstate 10 corridor and secondary highways and roads. Since that time, deeproot sedge invaded vast expanses of agricultural and native areas in southeastern states. It has been recorded from 72 counties in six states from northern Florida and southern Georgia to southeastern Texas. Deeproot sedge populations in Alabama, Florida, Georgia, and Louisiana are restricted to the lower Coastal Plain regions, but an infestation was detected as far north as the Delta Region in Tunica County, Mississippi, in 2004 and spread northward, southward, and westward has been observed in Texas. Although it thrives in open disturbed sites, deeproot sedge has invaded bottomland hardwood forest and coastal prairie communities in southeastern Texas and has recently been observed in bottomland hardwood forests in southern Georgia. Initial dispersal was by mowing, road construction equipment, and usual traffic, but livestock and native and migratory birds are also suspected of moving seed. Flooding, construction equipment, mowing, heavy traffic, and soil moving activities, especially along highways, spread its tiny seeds, resulting in infestations in new areas, particularly in disturbed habitats. Habitats for deeproot sedge include open, disturbed roadsides, ditches, fallow fields, pastures, edges and levees of rice fields, edges of salt marshes, coastal prairies and forested areas where it is typically found in poorly drained, mucky, loamy or clayey soils. It is a primary invader of disturbed soil at construction sites, new road construction, landfills, and dredge spoil areas, and deeproot sedge is displacing native vegetation even in undisturbed habitats. Plants have been observed surviving winters as far north as Tunica County, Mississippi [Consistency!]. The number of seed per inflorescence ranges from 1,000 to more than 20,000 depending on the size and maturity of deeproot sedge plants. Mature plants produce from 10 to over 100 inflorescences per year, thus a typical infestation can produce between one and two billion seeds/acre annually. Because deeproot sedge continues to spread at an alarming rate threatening agricultural and natural areas and preliminary studies suggest that populations will potentially spread northward into Arkansas, North Carolina, South Carolina, Tennessee, and Virginia, additional research is needed to determine more effective methods of prevention and control.

BROWN FLATSEDGE (*CYPERUS FUSCUS*): A POTENTIAL RICE WEED.
C. T. Bryson and R. Carter, USDA-ARS, Southern Weed Science Research Unit, Stoneville, MS, and Department of Biology, Valdosta State University, Valdosta, GA

Brown flatsedge (*Cyperus fuscus* L.) is native to Europe, Asia, Indian subcontinent, and the Mediterranean Region of Northern Africa, from Greenland and Iceland to China, south to Spain, Iran, Egypt, Algeria, and northern India. It was apparently introduced into North America in ballast or around wharfs and was first discovered in the U.S.A. in 1877. Since that time, brown flatsedge has been

discovered in Canada and several states of the U.S.A., including Arkansas, California, Connecticut, Kansas, Maryland, Mississippi, Missouri, Nebraska, Nevada, New Jersey, Pennsylvania, South Dakota, and Virginia. In addition to the association with ballast and wharfs, dispersal of brown flatsedge seeds has been attributed to waterfowl and human activities, including construction equipment. Brown flatsedge was reported as a weed in semitropical areas of the old world where it is a significant weed in rice. Because brownscale sedge was recently detected in the rice production areas of the Delta Region, research was initiated at Stoneville, Mississippi to study the basic biology and ecology of brown flatsedge. Field observations were made at three sites, Chicot County, Arkansas and Pearl River and Washington counties, Mississippi. Observations were made from early spring until frost from 2003 through 2007. Experiments were established in the greenhouse to determine growth parameters and the reproductive potential of brown flatsedge. Brown flatsedge seed were collected from Washington County, Mississippi during the fall of 2006 and planted during the summer of 2007. Plants were grown in the greenhouse for 10 weeks and plant height, diameter, and number of leaves per plant, and days to first flower were recorded. All plants were harvested and dry weights were recorded for roots, leaves, culms, bracts, and inflorescences. Field observations at the three sites in Arkansas and Mississippi, determined that brown flatsedge was highly dependent on persistently moist soil or shallow standing water for establishment, growth, and seed production. Over a five-year period under natural field conditions, brown flatsedge plants germinated from late March and early April until frost. Inflorescences were observed as early as May and seed production continued until frost. In greenhouse experiments, ten-week old brown flatsedge plants were30.2 cm tall and 63.9 cm in diameter and dry weights were 1.4, 2.0, 1.0, 0.5, and 1.9 g for roots, leaves, culms, bracts, and inflorescences, respectively. The first brown flatsedge culm appeared at week five and all plants were producing seed by week nine. Brown flatsedge seems to be in the lag phase and could pose a threat to rice agriculture in Arkansas, California, Louisiana, Mississippi, Missouri, Tennessee, and Texas. Additional research is needed to determine the ecological range potential and to develop control methods for brown flatsedge.

PRICKLY NIGHTSHADES (SOLANUM: SOLANACEAE) FOUND IN THE SOUTHEASTERN UNITED STATES. Charles R. Bryson, USDA-ARS

COGONGRASS RESEARCH IN MISSISSIPPI. John D. Byrd, Jr., Mississippi State University, Starkville, MS

COMMON REED: *PHRAGMITES AUSTRALIS* (CAV.) TRIN. EX STEUD: LIFE HISTORY IN THE MOBILE RIVER DELTA, ALABAMA. Joshua C. Cheshier and John D. Madsen, GeoResources Institute, Mississippi State University, Starkville, MS

Common reed (*Phragmites australis*) is a non-native invasive perennial grass that is problematic in aquatic and riparian environments across the United States. The ability to reproduce quickly combined with its ability to cycle nutrients has made *P. australis* an aggressive invader of aquatic environments. *P. australis* often forms monotypic stands that displace native vegetation which provide food and cover for wildlife. In order to help maintain native habitats and manage and populations of common reed in the United States, an understanding of its phenological cycle is needed. Twelve samples were taken from four sites throughout the Mobile River delta, in southern Alabama, every month from January to

December for two consecutive years. Relative chlorophyll content was measured in field using a Konica Minolta SPAD 502 meter. Samples were then separated into aboveground and belowground biomass, dried and weighed. Aboveground biomass peaked from September through December at 3400 g DW m^2 ($P<0.01$) whereas the below ground biomass (2520 g DW m^2) ($P<0.01$) as well as chlorophyll content (35.2 SPAD) ($P<0.01$) stayed constant throughout the entire year. Understanding the phenological cycle of common reed will provide information to guide management strategies of this invasive plant.

DIGITAL GROWTH OF COMMON REED (*PHRAGMITES AUSTRALIS* (CAV.) TRIN. EX STEUD).

Joshua C. Cheshier and John D. Madsen, GeoResources Institute, Mississippi State University, Starkville, MS, and David F. Spencer, USDA-ARS, Davis, CA

Common reed (*Phragmites australis*) is a non-native invasive perennial grass that has widely colonized aquatic environments throughout the United States. Most of the invasions in the US are by two genetically different haplotypes; haplotypes I and M. Haplotype I is native to South America and Asia and is found primarily along the Gulf coast. Haplotype M is native to Europe and Western Asia as well as Africa and is the dominant haplotype in the Northeast and Midwest US. An understanding of their growth is a key component in implementing proper and effective management protocols. A tool to aid in this is a digital growth model of these two haplotypes of common reed. This model used data derived from a 3-dimensional digitizing process to quantify morphological characters such as stem height, internode distance, stem number, node number, leaf length, leaf width and leaf area. Measurements were taken bi-weekly from emergence to senescence of two haplotypes of common reed; haplotypes I and M. Common reed was planted in 1.2 m x 1.2 m x 1.1 m tanks in Starkville, MS. Haplotypes I and M differed significantly ($p \leq 0.05$) in stem height 273.1 mm and 118.8 mm respectively ($p<0.0001$). Internode distance also differed between haplotypes I and M (19.3 & 12.4; $p < 0.0001$). Leaf length (85.6 vs. 42.1), leaf width (7.9 vs. 4.1) and leaf area (8.0 vs. 1.2) all differed significantly ($p<0.0001$) between haplotypes I and M. However the number of nodes (8.0 vs. 8.8; $p=0.1391$) and in the number of stems (4.5 vs. 4.8; $p=0.1364$) were not significantly different. Preliminary data indicates that haplotypes I and M differ in some growth forms

MANAGING INVASIVE PLANTS IN THE URBAN /RURAL INTERFACE: MY OWN CREEK BOTTOM.

Jimmie Cobb, Sales Specialist, Dow AgroSciences. AL Registered Forester, Certified Arborist, Utility Specialist

In my job, I assist many land managers in controlling invasive weeds. But what is going on in my own 6 acres of creek bottom back yard in Auburn, AL? I have identified more than 26 invasive species, trees, shrubs, grasses, and broadleaves. For each major invasive species, I have identified the likely sources of introduction. These include creek flooding, birds and other animals, plantings by my wife and my neighbors, commercial pine straw trade, and others. Control methods have been diverse, herbicides, cutting, hand pulling, drought, and re-planting natives. Success has been mixed, and the battle is still on with some species. Strategies are being updated as numbers are reduced. The larger management issue is coming up, as I try to enlist my neighbors in the project. My neighbors include other small land owners like myself, but also a 900 acre state park that needs to get interested in control. My approaches and success with each are outlined. While my neighbor is not interested in getting rid of Silverthorn and privet because they are invasive species, he is concerned that they are home to armadillo burrows, snakes, and other varmints. This has gotten him on board to controlling the tangle

of thorns, privet, and climbing fern. Where to go from here to keep my 6 acres under control and expand the invasive free zone will be a developing long term project. If the park comes on board, we might have a springboard to develop the project further.

APHIS PLANT PEST ACTIVITIES IN MISSISSIPPI. John Corban, USDA APHIS PPQ, Starkville, MS

DEVELOPING AN EXOTIC PLANT LIST FOR MISSISSIPPI. Gary N. Ervin, Department of Biological Sciences, Mississippi State University, Starkville, MS, and the Mississippi Exotic Plant Species List Committee

Many of the Southeastern Exotic Pest Plant Council states have developed state-level lists of exotic species of concern. The Tennessee and Alabama lists were created with the expressed purposes of ranking species based on potential invasion risk, fostering early detection & rapid response efforts for potentially expanding weed populations, and educating state and regional stakeholders at to the distribution and importance of selected weed species. In Georgia, the state exotic plant list was developed to aid in the identification and categorization of plants that pose potential threats to natural areas. The Florida list was assembled with the intent of focusing attention on: potential adverse effects of exotic species on native biodiversity, the need to prevent habitat loss through weed management, monitoring changes in seriousness of plant species over time, and providing information to help set priorities for weed control programs. At the 2007 conference of the Mississippi Exotic Pest Plant Council (MS EPPC), it was decided that a similar list should be developed by the MS EPPC for the state of Mississippi. A preliminary draft of that list has been assembled, and is presented at this conference in order to solicit input that can be used in working toward a final list of selected exotic plant species of Mississippi.

DRAFT EXOTIC PLANT LIST FOR MISSISSIPPI AND REQUEST FOR INPUT. Gary N. Ervin, Mississippi Exotic Plant Species List Committee

The Mississippi Exotic Pest Plant Council (MS EPPC) recently began development of a list of noteworthy exotic plant species for the state of Mississippi. This follows a series of similar lists being developed by other SE-EPPC member states and the SE-EPPC itself. Other state lists were created with such expressed purposes as: ranking species based on potential invasion risk, fostering early detection & rapid response efforts for potentially expanding weed populations, and educating state and regional stakeholders as to the distribution and importance of selected weed species. A preliminary draft of the Mississippi list is presented at this conference in order to solicit input that can be used in working toward a final list of selected exotic plant species of Mississippi. Materials and information related to the list and means for providing input also are available on the website for the Invasive Plant Atlas of the Mid-South (http://www.gri.msstate.edu/ipams/).

THE FORT BRAGG NON-NATIVE INVASIVE PLANT MANAGEMENT PROGRAM. Peter Frank, Chicago, IL; Matthew Hohmann, US Army Corps of Engineers ERDC-CERL, Champaign, IL; and Janet Bracey Gray, Endangered Species Branch, Fort Bragg, NC

Over the past five years, Fort Bragg has been working to address the challenge non-native invasive plant species (NIS) pose for successful integrated natural resources management. In 2003, the Fort Bragg cantonment was surveyed to document the use of NIS in landscaping. The following year, an extensive survey for NIS on Fort Bragg and Camp Mackall training lands, which are approximately 113,622 and 7,935 acres, respectively, was designed and implemented. Of the 90 NIS targeted by the survey, 39 were identified. Survey data from the more than 5,000, 25m x 50m plots were then used to interpolate installation-wide percent cover estimates for the 26 most widely distributed NIS. Most areas where NIS were projected to be present had low densities, with less than 25% combined cover for all species. Data obtained from the survey were then used to develop an Integrated Non-native Invasive Plant Species Management Plan outlining specific management goals and prioritized management actions. The objective, prioritization process was spatially explicit and based on NIS characteristics, abundance, and distribution, as well as the magnitude of the potential impacts NIS would exert on protected species and military training. This important planning phase has been followed by several years of NIS management using two different approaches. One approach is species-specific, targeting early detection/rapid response (ED/RR) control efforts on sixteen species determined to be in early stages of invasion on the installations. The other approach is site-specific, controlling NIS in high priority, threatened and endangered plant sites. To date, eighteen NIS have been managed at 156 sites, covering approximately 180 hectares throughout the installation. Notably, these strategic planning and control efforts have resulted in local eradication of white sweet clover, giant reed, white mulberry, autumn olive, tree of heaven, Japanese privet, sickle pod and Chinese tallow tree.

NATIONAL BIOLOGICAL INFORMATION INFRASTRUCTURE – BUILDING KNOWLEDGE THROUGH PARTNERSHIPS. S. Jean Freeney, NBII-SAIN, and Terri Killeffer IIa/NBII-SAIN

Biological information presents a tremendous challenge for the computer and information science communities. The information can vary in format, content, and distribution based upon the information needs, for example, of a particular species or a specific ecosystem. Efforts to address biodiversity conservation issues such as invasive species are challenged by the complexity of the information. Challenges also arrive due to the need to share information across government and non-governmental organizations, researchers, educators, and land managers. The National Biological Information Infrastructure (NBII) (http://www.nbii.gov) was established in 1993 to address these complex challenges through national and regional partnerships within the United States and through international partnerships abroad. This session will discuss the NBII partnership network, national and regional initiatives, and current computer, geospatial, and information science efforts within the NBII Program to aid in the analysis, management, and delivery of biological data within the community.

SOUTHEAST COLLABORATION AND PARTNERSHIP COMMUNITY – A WEB-BASED TOOL SUPPORTING CONSERVATION INITIATIVES IN THE SOUTHEAST. S. Jean Freeney, NBII-SAIN, and Terri Killeffer, IIa/NBII-SAIN

The My NBII Intranet Portal (http://my.nbii.gov) provides access to biological content and services through a single web accessible interface. National Biological Information Infrastructure (NBII) partners, scientists, and staff can use the NBII Portal to collaborate on a wide range of questions related to the management, use, or conservation of this nation's biological resources. The Southeast Collaboration and Partnership Community (SECAP) has been established within the My NBII Intranet Portal to provide various agencies and organizations within the southeastern United States a controlled access infrastructure to support conservation initiatives. Functions supported with SECAP include: document management, discussions (listserv), project management, calendaring and announcements. Support of SECAP is provided by the NBII Southern Appalachian Information Node (SAIN).

A COOPERATIVE WEED MANAGEMENT AREA FOR MISSISSIPPI AND OTHER ACTIVITIES. Benny Graves, Mississippi Department of Agriculture and Commerce

INVASIVE NON-NATIVE PLANTS AND URBAN FORESTS IN THE SOUTHEAST. Connie Gray, Natural Areas Consultant, Atlanta, GA

Undeveloped lands in urban areas are frequently degraded ecosystems due to fragmentation, hydrologic changes, heavy visitor use, and other pressures, including the proliferation of non-native plants. While these “natural areas” may be considered to be a loss, ecologically speaking, they offer a valuable resource in the fight against invasive exotic plants. Urban areas are often the “front” of new infestations and may provide a picture of what could come to rural areas if invasive plants are not addressed. While these forests present significant management challenges, they also offer many opportunities to learn about invasions and to educate the public.

ENGAGING VOLUNTEERS IN MANAGING INVASIVE PLANTS, Newt Hardie, Kudzu Coalition, Spartanburg, SC

The Spartanburg, SC, Kudzu Coalition has enlisted dozens of adult volunteers and hundreds of student volunteers in the local battle to control a major invasive plant. Dozens of successes over three years have shown that volunteers can control small to medium size infestations of kudzu without use of herbicides. This "journey" has taught many lessons about the more general subject of attracting volunteers and maintaining their enthusiasm for responding to threats posed by non-native plants. The presentation identifies and explains tips for successful and unsuccessful volunteer participation -- experiences learned the hard way. These efforts grow stronger and smarter each year and provide a model for others who are interested in hands on, stakeholder involvement in combating invasives.

INTEGRATIVE DECISION MAKING TO OPTIMIZE NATURAL RESOURCE MANAGEMENT: A NON-NATIVE INVASIVE PLANT MANAGEMENT PRIORITIZATION EXAMPLE. Matthew Hohmann, US Army Corps of Engineers ERDC-CERL, Champaign, IL; and Peter Frank, Chicago, IL

Comprehensive strategies for non-native invasive plant species (NIS) management depend upon a multi-pronged approach that includes prevention, early detection, control, monitoring, assessment, and education. NIS control is arguably the most challenging of these because it typically requires the greatest monetary investment, suffers the greatest setback from poor choices, and demands the greatest coordination among multiple stakeholders. Here we address the highly important, but under-emphasized process of prioritizing NIS control efforts. We used multi-criteria decision analysis (MCDA) to objectively integrate multiple diverse stakeholder interests with multiple datasets describing NIS impacts. In this example, NIS prioritization was driven by two sub-objectives, namely minimizing impacts to natural resources management and ensuring certain management efficiencies were realized. The systematic, flexible, transparent, and reproducible approach of MCDA can substantially improve decision-making by forcing careful consideration of the best available knowledge about NIS impacts, NIS biology, legal requirements, and management costs within a hierarchy of objectives.

RELATIVE IMPORTANCE OF PROPAGULE PRESSURE, LIGHT AVAILABILITY, AND NUTRIENT CONCENTRATION UPON THE ESTABLISHMENT AND PHYSIOLOGY OF A MODEL INVASIVE SPECIES, *IMPERATA CYLINDRICA*. D. Christopher Holly and Gary N. Ervin, Department of Biological Sciences, Mississippi State University, Starkville, MS

Imperata cylindrica (L.) Beauv. is a highly invasive perennial grass that threatens agriculture, forestry, and native plant assemblages in many regions of the world. *Imperata cylindrica* is a prolific seed producer, but the importance of seed as a vector of invasion has not been adequately addressed for this species. Further highlighting the need for studies on seed-mediated spread in this species is the growing support in the ecological literature that propagule pressure plays a key role in many successful invasions. The relative importance of propagule pressure across environmental gradients is an area of research that is quickly becoming important in understanding invasion success. The present study was conducted in order to test the effects of varying propagule pressure upon the ability of *I. cylindrica* to grow and establish across experimentally manipulated light and soil gradients. The results pointed out several biologically significant trends in the establishment and growth of *I. cylindrica* seedlings in the experimental environments. Seedlings growing in high nutrient soils performed the best regardless of the amount of available light, but overall biomass was always greatest in high light environments. *Imperata cylindrica* showed a very strong trend in biomass allocation, with seedlings in reduced light environments always partitioning more biomass to aboveground tissue. The data provided no evidence that initial propagule density affected the growth and establishment of *I. cylindrica* seedlings, but realized propagule pressure (number of surviving seedlings) had a positive effect on growth and biomass production on a per-seedling basis.

CHARACTERIZATION AND QUANTITATIVE ASSESSMENT OF A POTENTIAL RHIZOME-MEDIATED ROOT DISTURBANCE MECHANISM IN COGONGRASS. D. Christopher Holly and Gary N. Ervin, Department of Biological Sciences, Mississippi State University, Starkville, MS

Cogongrass (*Imperata cylindrica* (L.) Beauv.), an invasive C-4 perennial grass, negatively influences native plant communities by forming dense monotypic stands that alter ecosystem properties and lower local species diversity. A previously hypothesized mechanism by which cogongrass achieves competitive dominance is through puncturing of neighboring plants by the sharply tipped cogongrass rhizomes. However, very little empirical evidence has been found in the peer-reviewed literature to quantify this phenomenon, much less establish it as a true form of competitive interaction. The present field study was conducted to: (1) quantify the occurrence of rhizome-mediated below-ground vegetative penetration, both interspecifically and intraspecifically; (2) document how this phenomenon is influenced by spatial location relative to the cogongrass stand; (3) determine the role above-ground and below-ground biomass may have in the process. Results indicated that rhizome-mediated below-ground vegetative penetration can be a much more frequent intraspecific phenomenon than interspecific. The data also strongly pointed to spatial location as a significant factor, with most penetrations occurring in the interior of a cogongrass stand as opposed to the advancing border. Significant correlations of rhizome-mediated below-ground vegetative penetration, as a function of above-ground cogongrass biomass, were found in the overall plot analysis and most strongly in the advancing border of a cogongrass stand.

ACCELERATED DECOMPOSITION RATES BY *IMPERATA CYLINDRICA* IN SOUTHERN MISSISSIPPI ARE CORRELATED WITH MICROBIAL COMMUNITY STRUCTURE AND FUNCTION. D. Christopher Holly[1], Gary N. Ervin[1], Colin R. Jackson[2], Susan V. Diehl[3], Grant T. Kirker[3], [1]Department of Biological Sciences, Mississippi State University, Starkville, MS; [2]Department of Biology, University of Mississippi, Oxford, MS; [3]Department of Forest Products, Mississippi State University, Starkville, MS

In situ decomposition of above and belowground plant biomass of the native grass species *Andropogon glomeratus* and exotic *Imperata cylindrica* was investigated using litter bags over the course of a 12 month period. The above and belowground biomass of the invasive *Imperata* always decomposed faster than that of the native *Andropogon*. This finding reinforces the growing trend in the invasion literature of increased decomposition rates exhibited by invasive plant species. Belowground biomass of both species decomposed at a consistently faster rate when placed within an invaded area consisting of a monotypic stand of Imperata, as opposed to within a native plant assemblage. The microbial communities associated with the invaded sites often differed compositionally as well as functionally from those found in the native vegetation and provide a possible causal mechanism by which to explain the observed differences in decomposition rates. The study supports the growing consensus that invasive plant species alter normal ecological processes and highlights a possible mechanism (alteration of microbial assemblages) by which a model invasive species may alter the ecosystem level process of decomposition.

INVASION OF THE EXOTIC *PAULOWNIA TOMENTOSA* AT LINVILLE GORGE AND CHANGES IN ITS HABITAT DISTRIBUTION OVER TIME. Dane M. Kuppinger, University of the South, Sewanee, TN

Paulownia tomentosa (Paulownia), a native of Asia, began invading xeric forests of the southern Appalachians following wildfires in the 1980's and heavily invaded Linville Gorge (Pisgah National Forest) following a wildfire in 2000. *Paulownia* habitat models were developed for the Gorge utilizing Classification Tree models and survey data from 5 fires across the Southern Appalachians. Resurveys of the plots at Linville Gorge, allowed for an analysis of changes in *Paulownia* habitat over time. In 2002, these models predicted *Paulownia* habitat to exist over 6.57km^2 of the Gorge. That shrank to 2.43km^2 of habitat in 2004 and to 1.79km^2 of habitat in 2006. *Paulownia* habitat losses are particularly concentrated on more mesic sites, at lower elevations, on flatter slopes, and in areas that burned with lower severity as measured by the variables Topographic Convergence (TCI), elevation, slope, and difference in the Normalized Burn Ratio (dNBR) respectively. Lack of significant habitat restriction on the steepest, driest portions of the landscape suggests that although *Paulownia* may suffer range restriction, it is not likely to be expatriated from the Gorge during the course of succession. That these areas are also habitat to two rare endangered species, *Liatris helleri* and *Hudsonia montana*, leaves open the possibility of potential impact to these species' populations within Linville Gorge.

MISSISSIPPI FORESTRY COMMISSION'S EFFORTS WITH INVASIVE EXOTIC PLANTS. Mike Lee, Mississippi Forestry Commission

COGONGRASS (*IMPERATA CYLINDRICA* (L.) BEAUV.) RESPONSE TO HERBICIDE TREATMENTS AND SUBSEQUENT SPECIES COMPOSITION ASSESSMENTS ON CAMP SHELBY JOINT FORCES TRAINING CENTER, MS. Lyman, Melinda R.[1], Lisa Y. Yager[2]; [1]The Nature Conservancy Camp Shelby Field Office; [2]Mississippi Museum of Natural Science

Efforts to control cogongrass with herbicide were initiated on Camp Shelby Joint Forces Training Center, MS in 2004. In 2007, 76 cogongrass patches were evaluated for their response to treatments of glyphosate and imazapyr. Patches were sprayed in 2004 and retreated in subsequent years if cogongrass regrowth occurred. Of all patches under evaluation, 46% showed no regrowth in 2007. Infested areas were reduced to <25% in the majority of those patches that experienced regrowth sometime after treatment. Species composition assessments have demonstrated an overall increase in species richness and frequency among all treated patches. Among the 76 cogongrass patches evaluated, 21 were chosen to evaluate changes in species composition over time. Herbicide treatments between annual species composition assessments showed minimal effects to overall richness. Of the 177 species observed in 2007, 42 of these were new as compared to 2006 observations. Species exhibiting the highest frequency in 2007 were *Rubus* spp. (Blackberry/Dewberry) and *Andropogon* spp./*Schizachyrium scoparium* (Bluestem complex), while species exhibiting the highest change in frequency were *Dichanthelium* spp. (Panic grass), *Diodia virginiana* (Virginia buttonweed), and *Acalypha gracilens* (Slender threeseed mercury). *Ambrosia artemisiifolia* (Annual ragweed) remained the same. Cogongrass frequency among these patches dropped 5% in 2007. Although plant species richness increased after herbicide treatments, complete eradication of this noxious weed was not achieved.

SEED GERMINATION OF SELECTED MAIDENGRASS (*MISCANTHUS* SPP.) CULTIVARS AND VARIETIES.
Victor Maddox, GeoResources Institute, Mississippi State University, Mississippi State, MS, John Byrd, Plant and Soil Sciences, Mississippi State University, Starkville, MS;, John Madsen, GeoResources Institute, Mississippi State University, Starkville, MS; and Randy Westbrooks, United States Geological Survey, Whiteville, NC

Thousands of exotic species have been introduced to the United States. Many times the invasibility or risk of these species is unknown. Determining risk associated with introduced species could be of great benefit in the prevention or early detection of invasions. Grasses are numerous in scope and continue to be introduced into the United States, mostly as forages or ornamentals. Efforts conducted from 2005 to 2007 with two ornamental species of *Miscanthus*: *Miscanthus floridulus* (Labill.) Warb., and *M. sinensis* Anderss. *Miscanthus sinensis* cultivars and varieties studied were 'Arabescue', g*racillimus* Hitchc., 'Graziella', 'Kirk's Dwarf', 'Little Kitten', 'Morning Light', 'Purpurescens', 'Sarabande', 'Strictus', *variegatus* Beal, and *zebrinus* Beal. The purpose of this study was to determine which species and/or cultivars pose a risk of invasion, suitable temperatures for seed germination, and if *M. sinensis* cultivars and/or varieties pose a greater risk when outcrossing is possible. Seed for the 2006 and 2007 germination studies were collected in the fall of 2005 and 2006, respectively, from field plants and retained in a refrigerator prior to plating. Multiple seedheads from multiple plants were collected for each grass. Two replications of 100 seeds per grass were placed on wet germination paper in petri plates. Petri plates were placed in a curtain germinator under continuous lighting and at constant temperatures of 12^{o}C, 18^{o}C, 24^{o}C, 30^{o}C, or 36^{o}C. Separate runs were conducted at each temperature. Percent germination was recorded for each grass at each temperature. In 2006, *M. sinensis* 'Purpurescens', *M. sinensis* 'Strictus', and *M. sinensis variegatus* all produced viable seed. All germinated at temperatures of 24^{o}C, 30^{o}C, and 36^{o}C, except *M. sinensis* 'Purpurescens' which showed no germination at 36^{o}C. In 2007, germination was observed in *M. sinensis* 'Arabescue', g*racillimus*, 'Graziella', 'Little Kitten', 'Morning Light', 'Purpurescens', 'Sarabande', 'Strictus', *variegatus*, and *zebrinus*. Only 'Kirk's Dwarf' showed no germination at any temperature. 'Little Kitten' showed germination at 24^{o}C and 30^{o}C, but not at temperatures above or below. Germination was highest at 24^{o}C for most grasses in the studies. Percent germination was considered low since the highest germination in either year was only 36%. However, seed production on these grasses can be at least 1100 seed per inflorescence. No germination was observed at 12^{o}C or 18^{o}C in either year, but germination at higher temperatures may be expected since all are warm-season or C4 grasses. Regardless, germination appears to be inconsistent from year to year. Seed germination studies conducted on 2007 seed to determine if outcrossing influences seed viability will also be presented.

CACTUS MOTH DETECTION NETWORK. John D. Madsen, Richard L. Brown, Gary N. Ervin, Victor L. Maddox, and Clifton F. Abbott. Mississippi State University, GeoResources Institute, Starkville, MS

The US Geological Survey, National Biological Information Infrastructure, USDA-APHIS and the Mississippi State University entered into a partnership in 2004 to develop the Cactus Moth Detection Network. A team of scientists at Mississippi State University is collaborating on an overall project with six components. The Mississippi Entomological Museum has developed techniques for identification of

cactus moth, as well as verifying the identification of field specimens. Surveys for native pricklypear cactus species have been conducted to map the locations of potential hosts. Volunteers are being solicited to establish an early detection network for cactus moth at georeferenced sentinel sites. A predictive model is under development to predict the locations of pricklypear cactus populations. A wide range of extension publications have been developed for the use of volunteers, resource managers, and other. Lastly, a web-based database and ArcIMS map have been developed (http://www.gri.msstate.edu/cactus_moth) to track cactus and cactus moth. Our group is active in coordinating our efforts with other groups working on cactus moth, as well as other invasive species efforts within USGS and NBII. Regular updates in the form of monthly reports are available either on the webpage, or through a subscription e-mail list.

GEORGIA'S COGONGRASS EFFORTS: MANAGING COGONGRASS IN DISTURBED LANDSCAPES.

Mark McClure, Georgia Forestry Commission

Cogongrass in Georgia

There were fewer than 10 known cogongrass infested sites in Georgia in 2004 and USDA APHIS (Animal and Plant Health inspection Service - Plant Protection and Quarantine) were treating the sites. The Georgia Forestry Commission (GFC) received an invasive species grant in 2004 from the USDA Forest Service (USFS), Forest Health Protection and began examining the problems of invasive plants throughout the state**.** Cogongrass was quickly recognized as the most serious threat despite the low numbers of sites and acres reported**.** As information on this species was circulated within the GFC, The University of Georgia (UGA) County Extension Agents and other partners during the year, **many additional spots were located, primarily in the southwestern portion of the state, confirming our suspicions that there were numerous unreported infestations of cogongrass**. Presently, there are a total of 110 known cogongrass spots in 20 Georgia counties.

Sources of Introduction & Education

Timber Harvesting Equipment: Numerous talks have been given to **Georgia Loggers** regarding the likelihood cogongrass could be transported on timber harvesting equipment. The majority of known cogongrass sites were introduced with timber harvesting equipment in pine plantations during thinning operations. Loggers from Georgia, Florida and Alabama operate in the southwestern portion of the state. Without sanitation efforts being made, the spread of seed material and rhizomes is common. Numerous

Tree Planting Vendors: Establishment of cogongrass in unthinned pine plantations is often a result of contaminated tree planting equipment. Most of these sites are being identified by foresters when timber marking. Presentations have been made to foresters and vendors regarding the need to sanitize tree planting equipment.

Utility Companies: Cogongrass was introduced when power poles were installed. Contaminated rock and fill material placed around each pole was the source of origin. Training has been given to Georgia Power employees including right of way and land management foresters and contractors.

Rights-of-way: The **Georgia Department of Transportation** (Right of Way Division) has received numerous training sessions, and not only have workers looking for cogongrass, but have implemented a sanitation requirement for out of state mowing crews who maintain our Interstates throughout the state. Several sites have also been established along local county road rights-of-ways. A training session was given to the **Georgia Public Workers Association** annual meeting. Localized meeting with County Public Work Directors have also been made. Origin of these right-of-way spots is speculated but

unknown. The major concern is the spread of both seed material and rhizomes with road maintenance equipment.

Sportsmen: Several infestations were likely initiated by out of state hunters who brought in equipment to establish and maintain food plots (that wasn't properly sanitized). Targeting this group has been more ambiguous but articles have been published by several groups with widespread magazine distribution: National Wild Turkey Federation, Georgia Outdoor News and the Georgia Wildlife Federation. Also, an ad was formulated and published in the Georgia Hunting Rules and Regulations Book (this is a free publication that lists all game season, limits, etc.) that is available at all places where hunting licenses are sold with a printing volume of 550,000 annually.

Homeowners: Several spots in urban areas have originated from contaminated mulch and nursery stock. Landscape trees purchased from an out-of-state vendor had cogongrass growing in the root ball.

Monitoring Major Disturbed Landscapes

The catastrophic wildfire in Waycross in the spring/summer of 2007 disturbed a large landscape in and surrounding the Okefenokee National Wildlife Refuge. Private lands, timber industry and federal ownership were affected. Firefighting equipment and personnel from all parts of the country assisted with the firefighting efforts. In addition loggers from Georgia and Florida assisted with timber salvage operations. Tree planting vendors from both Georgia and Florida will be involved with the enormous task of reforestation. With this equipment has come the potential for importing invasive/noxious weeds and other undesirable vegetation from seed or root material that may have been transported on the equipment. As the reclamation and rehabilitation process takes place in the disturbed areas, efforts will continue to be made to monitor for and detect cogongrass and other invasive species infestations.

A State MOU for Cogongrass

A memorandum of understanding to establish a cogongrass weed management area for the state of Georgia has been drafted and circulated (and approved) by the many partnering groups and agencies. A formal signing and press event will occur in spring 2008. This event will coincide with the spring seeding characteristic that is the most recognizable taxonomic characteristic for the public.

Key partnerships (and roles) for the leadership within Georgia's Cogongrass Program:

A cogongrass task force was organized to formally address the issue and some of our key partnerships with other groups and agencies began at that time:

1. GFC – education, detection and field visits when reported, eradication treatments
2. UGA – education, detection, web support, printed materials and publications
3. USDA APHIS (PPQ) – detection and eradication treatments
4. USDA USFS – funding, education
5. Jones Ecological Center – education and outreach
6. Georgia Department of Agriculture – detection and plant industry regulation enforcement
7. Mark Atwater – Weed Control Unlimited, Inc.

Political support is Critical

A legislative tour was held at the Tall Timbers Research Station on August 17, 2006 and numerous local political leaders, state legislators, and congressional aides attended along with herbicide company representatives, University faculty (from UGA and MS State), State and private foresters and other resource professionals. Classroom presentations as well as a guided field trip allowed for a full day of information exchange.

Working with Neighboring States

Currently, the GFC is partnering with the SC Forestry Commission, Alabama Forestry Commission, and the Florida Division of Forestry, with a regional grant to continue our efforts. We plan to execute a Memorandum of Understanding to establish the entire state of Georgia as a Cooperative Weed Management Area for Cogongrass in the spring of 2008, and will attempt to maximize media coverage of this event to get the public looking for cogongrass when the seed heads are present. Our outreach work that has gained momentum will continue into the future to gain additional partners in the detection effort.

SITE SPECIFIC CONSIDERATIONS. Arthur E. Miller, Retired USDA-APHIS-PPQ Regional Program Manager, Raleigh, NC, and Nancy Fraley, Liaison, SE Exotic Plant Management Team, National Park Service, Asheville NC

The approach taken to control invasive plants at various sites may be similar or vary greatly. These are some general site specific issues to consider:

- Target Species - Parasitic, aquatic/wetland, or terrestrial; tree, bush, vine, forb, or grass; and positive identification.
- Growth Stage - Vegetative, flowering, fruits, seeds, etc.; height of target plants; and stage of other invasive plants.
- Infestation Size - Acres and density of invasive plants; number of other sites with the species; and significance.
- Site Conditions - Other invasive plants; desirable plants; topography; sun; parts of site may differ; neighboring properties; and pathways present.
- Property Management - Permission to survey and treat; site plans including restoration or revegetation; and visibility.
- Method Options - Treatment record; standard treatment for type of site; biological, mechanical, prescribed burning, herbicides, cultural, and integrated vegetation management; no action; eradication versus control; available herbicides; timing; and safety issues.
- Costs - Hours, travel distance, equipment, personnel, etc.; budget - priority of site; cooperators; cooperative funding; and volunteers.

SYNTHESIS OF THE COGONGRASS REGIONAL CONFERENCE: WHAT WE LEARNED AND WHAT WE NEED TO KNOW. James H. Miller, Invasive Species Researcher and Affiliate Professor, USDA Forest Service R&D, Auburn University, AL and Nancy J. Loewenstein, Auburn University School of Forestry and Wildlife Sciences and Alabama Cooperative Extension System

The Regional Cogongrass Conference was convened in Mobile on November, 7 & 8, and 350 participants from 10 states heard presentations from 19 regional and local experts on cogongrass management and strategies. The Proceedings, aka, “A Cogongrass Management Guide” was compiled before the conference for distribution there, and now is posted on www.cogongrass.org along with the PowerPoint (PP) presentations. In the near future the audio presentations with the PPs will be posted. The presentation team with members from across the southern region (see a listing of the presenters in the Proceedings) provided current understanding of ways to confront the onslaught of cogongrass, how to

stop the spread and restore infested lands, and become organized within states and multi-county areas. This post-conference synthesis is aimed at condensing valuable facts and understandings learned from the presenters to assist the development of extension materials, prescriptions, and organizations.

Cogongrass: The World-class Invasive

1. Cogongrass (*Imperata cylindrica*) is a non-native C4 tropical to subtropical grass from eastern Asia that invades and degrades crops, range, and forests on every continent to varying degrees. It was introduced from at least 4 to 5 Asian sources into the SE U.S. in the early 1900's. It is now a Federally Listed Noxious Weed which bars further introductions and interstate sales and transport. Still, ornamental red cultivars, presumably with sterile seeds but fertile pollen, are sold widely in the U.S., including most SE states with unclear consequences.
2. Severe cogongrass infestations occur in central FL, southern AL and MS with advancing fronts spreading in FL, AL and MS and outlier infestations in TX, LA, GA, and SC. A confirmed lawn infestation in Lexington, TN, has recently been reported.
3. Cogongrass is a one of the most difficult to control invasives because:
    a. it grows on the full range of sites in the SE, including degraded soils, and is drought tolerant with sustained productivity relative to native plants during dry conditions;
    b. it is shade tolerant, persisting under forest canopies, but grows best in edges and in the open;
    c. the abundant branching and transportable rhizome mass can rapidly spread into adjacent disturbed soils and the sharp tip can pierce the roots of plants. Patches have been assumed to be clonal from rhizome transport while recent research shows increasing genetic variability within patches as the distance from the Gulf increases;
    d. there is a potential of about 360 windblown seed per plant with viability usually reported at less than 1% while germination of filled seed is over 90%. Cross pollination is required and seeds are blown usually in clumps, which would support the idea of genetically variable patches. Seeds can germinate immediately while viability is thought to be less than 1 year;
    e. and, cogongrass has superior fire adaptations relative to native plants, with burned cogongrass resprouting within weeks and rapidly sending forth new rhizomes. Each rhizome segment has a shoot bud that is activated when apical dominance is disrupted (tops are killed).

Preventing the Spread

1. Prevention revolves around networks for surveillance, tracking, mapping, and monitoring of infestations. Publicly accessible mapping networks are being developed, while currently available is the Early Detection and Distribution Mapping System (EDD Maps) at the Center for Invasive Species and Ecosystem Health at the University of Georgia. New and outlier infestations must be reported then eradicated.
2. Cogongrass spreads by both seed and rhizomes. The plumed seeds usually blow less than 150 ft while a few can be carried for miles in high winds. Both seeds and rhizomes hitchhike on equipment and have caused long distance spread. Hitchhiking can only be prevented by inspections of clothing and equipment after operations in infested tracts and sanitation when required before movement.

3. Positive identification of cogongrass is somewhat difficult and hinders efforts. The identification publication on www.cogongrass.org and similar state extension fact sheets can be valuable aids. Training in identification at various levels is a critical need across the region.
4. Raising awareness with public education and extension is an immediate high priority. The PowerPoints from the conference can be downloaded, reassembled, and used by anyone to aid training.
5. Restoration or maintenance of communities resistant to invasion must be the aim of any management program. Closed tree stands with a shrub layer are most resistant, followed by waxy leaf shrub communities, followed by warm season grass stands, with the most susceptible being mixed prairies and burned areas. Thus, the recent promotion and wider adoption of prescribed burning of forest stands comes with a threat of cogongrass establishment in infested areas.

Treating Infestations and Restoring Sites

1. Cogongrass management requires persistent integrated treatments using herbicides, mechanical, treatments, and possibly burning. Timely retreatments whenever cogongrass reappears should be accompanied with revegetation efforts. The most effective sequence of treatments for all situations has yet to be fully identified, while research has provided workable prescriptions for pastures, roadsides, and forest lands.
2. The most effective herbicides against cogongrass contain the active ingredients of imazapyr and glyphosate. Both brand name and newer generic formulations are available. While generics cost less, there are questions by professionals regarding consistency in quality and manufactures' liability support. Imazapyr is more active on cogongrass but has residual soil activity and can damage some desirable plants having roots in the treated area and those planted after treatment. Where there are concerns for non-target damage, glyphosate, which requires more retreatments, is typically used. A list of equivalent brand name and generic formulations is provided in the back of the Conference Proceedings.
3. Treatment details are given at www.cogongrass.org.
4. Treatments with glyphosate, imazapyr, and other herbicides during or immediately before flowering can stop seed formation.
5. Burning has routinely be used to remove thatch and aid in the spraying of new regrowth, but fire kills native plants, and all research has shown increased rates of rhizome encroachment after burning. The benefits of burning to assist application must be weighed against the threat of more rapid spread.
6. Disking and burning can be used in combination with herbicide applications to decrease cogongrass rhizome biomass. The sequence and schedule is critical.
7. After herbicide treatments to suppress cogongrass, other aggressive species of trees or grass (and possibly shrubs or vines) must be established to gain long term restoration. Establishment of loblolly pine plantations using good genetic sources, quality seedlings, careful seedling handling, and proper planting has been found practical at the study location viewed on the field tour. Preplanting treatments with herbicides accelerated growth after 5 years but was not necessary for establishing a fully stocked stand, even when planting in a 10-year old infestation.
8. Warm season grasses have shown resistance to invasion in controlled experiments, while this has not been found in field studies. Establishment of warm season grasses, like broomsedge

and little bluestem, are not assured with current seed and plant sources and procedures, but have promise.

9. In pastures, deep plowing and seedbed preparation with planting of ryegrass or fescue has been successful in eradicating cogongrass infestations. Plowing and harrowing cogongrass infestations and planting glyphosate resistant crops with follow-up oversprays of glyphosate can be successful for conversion to row crops.
10. Contract herbicide applicators are available in most locations and are capable of effectively treating cogongrass for private and public landowners.
11. Biocontrol by insects, diseases, nematodes, and grazers is a possibly and could be developed with appropriately funded research and development. Intensive grazing by horses of overseeded infestations using bahiagrass has worked.

Organizing for Success.

1. We are making great strides to organize at the regional, state, and county levels to stop the spread of cogongrass. Good examples of new programs at the state and local levels are presented in the Proceedings.

2. Even though it is a federally listed noxious weed, federal programs and responsible federal and state agencies are underfunded to effectively aid in the process. Redirection of appropriation must occur.

3. Eradication along road rights-of-ways and on immediately adjoining lands must occur through departments of transportations and county roads initiatives. In the same way, eradication along rivers must be the responsibility of TVA and the power companies.

4. Knowledge networks such as www.invasive.org and www.cogongrass.org at the University of Georgia, as well as publicly accessible mapping programs for tracking cogongrass, such as EDD Maps, and in the future http://invasive.princeton.edu/ are presently accessible and growing, Broad training of citizen scientists and agency personal are needed to generate specific infestation locations using GPS coordinates.

5. Grants, incentives and cost-share programs are available but need greater funding and a broader scope.

What we need to do next

Formulate State Cogongrass Management Plans that state our common GOALS, our objectives and a time line.

- Prevent the northward spread and stop long distance vectors – Save the Eastern Region
- Contain the spread of the advancing front within States – Early Detection and Rapid Response (EDRR)
- Save Special Habitats and Preserves from degradation
- Restore infested lands to productive, resilient, and sustainable systems
- Implement a tracking system
- Implement the plan at the local level

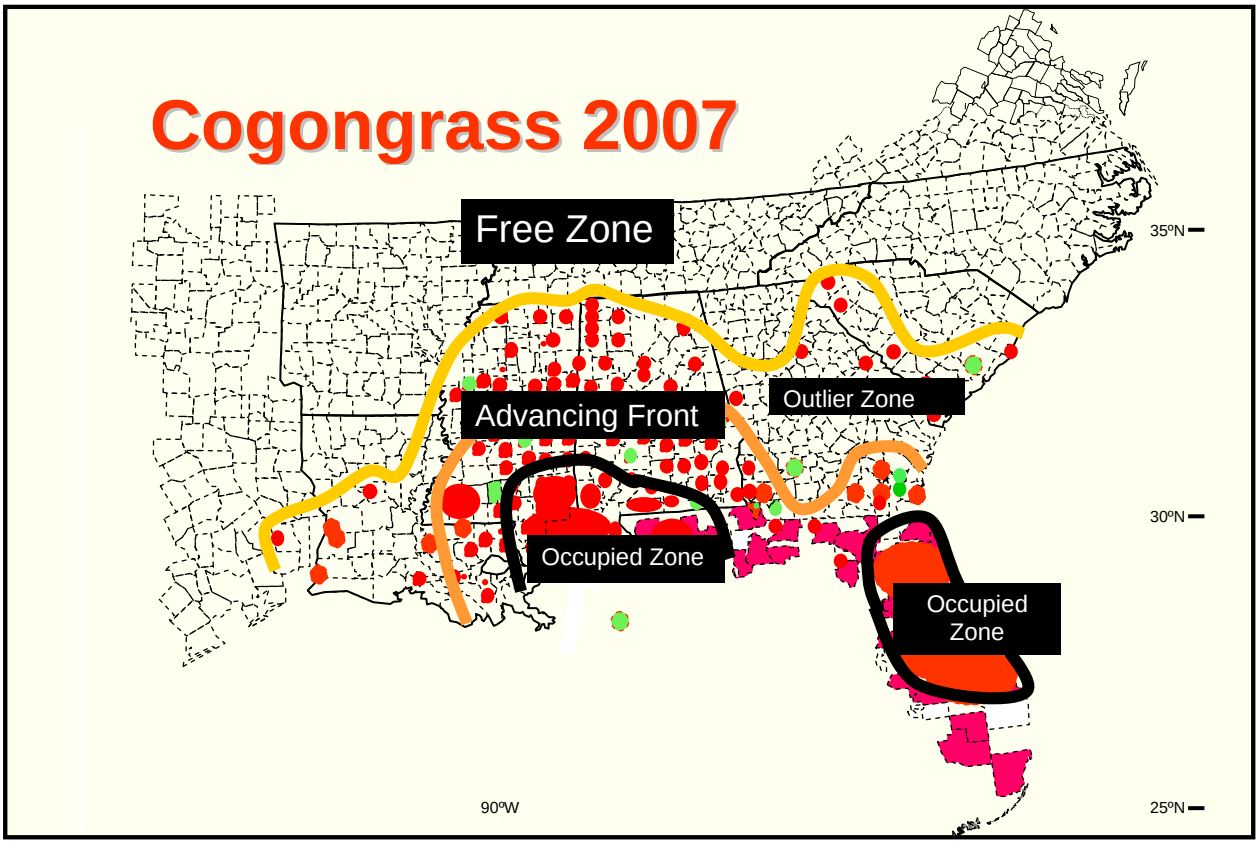
Engage and enlist volunteers to enact an Adaptive Cooperative Management Program. And find roles in this program for people with different abilities and skills.

Perform cost-risk analyses to quantify the losses that we are incurring so that we can communicate these to leaders and citizens to make them firmly aware of what we are and will be losing.

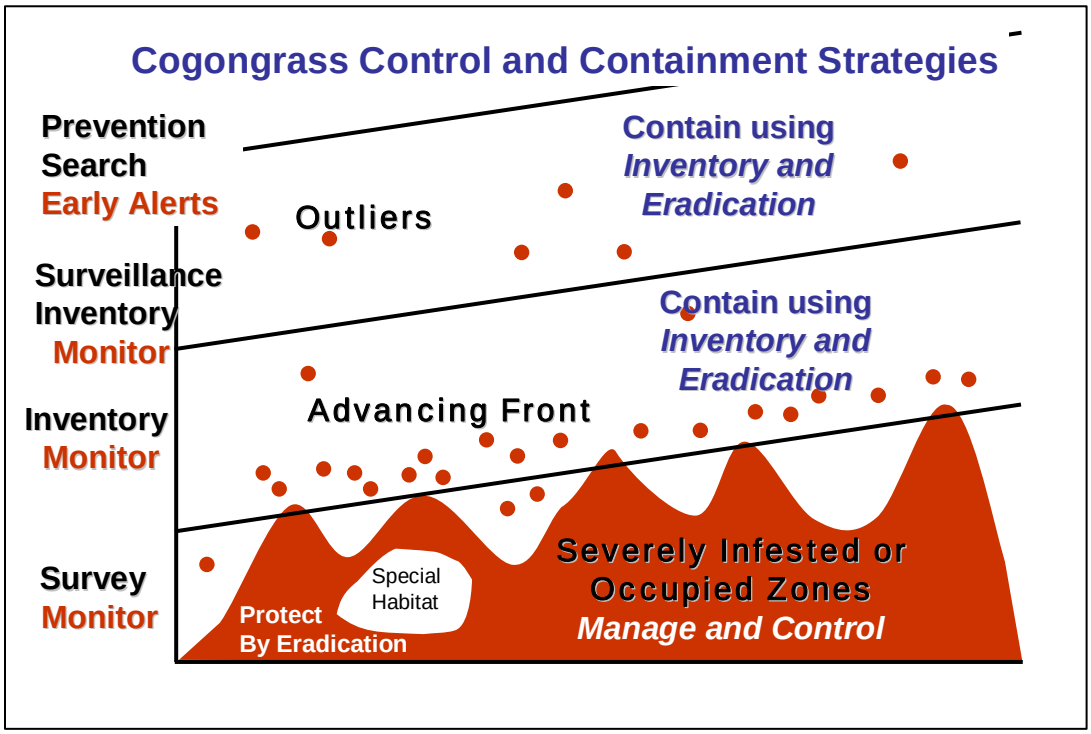
Seek political and agency leadership and involvement.

Organize research and development to devise and communicate better management and restoration strategies and treatments.

STOP THE SPREAD through organized programs at state and the regional levels that can be implemented at the local level. Draw lines on maps to show areas requiring different strategies**.**



Current occupation of cogongrass with four zones that require different strategies.



Outlier Areas

There are areas beyond the highly infested areas where outlier infestations must be detected early and eradicated. Public education is needed for early detection along with organizing search and surveillance teams with reporting networks. Movement of contaminated equipment and materials must be stopped.

The Advancing Front

All infestations must be found and recorded across the landscape. All ownerships must be included. Treatment must be persistent to stop seed dispersal. Equipment and personnel sanitation must be employed when working near or in infested areas. Special habitats of plants and animals must be saved from destruction. The front must be held and pushed back.

Severely infested Areas

Surveys are required to quantify the acres of infestation. Concerted programs with landowner assistance are needed to fuel control. Equipment and personnel sanitation must be employed when working near or in infested areas. Any forest and nursery product movement must be monitored for contamination. Special habitats of plants and animals must be saved from destruction. Homes must be safeguarded against wildfire.

Win the land Back!!! Become involved in this crisis which imperials future generations.

Everyone can contribute to the effort to combat cogongrass. There are many roles to be performed in an organized approach, which will require people of many talents and know-how. Education is a key need, so educators can play a role. Leadership is needed at all levels from elected officials to group leadership. Searching and reporting of new infestations can be done by many with the right training and

reporting network. Trained land owners, managers, consultants and contractors along with State and federal agencies personnel will carry the fight to the land, much like stopping a huge wildfire.

CENTER FOR INVASIVE SPECIES AND ECOSYSTEM HEALTH. David J. Moorhead, G. Keith Douce, Charles T. Bargeron, Carey Minteer, and Joe LaForest; University of Georgia, Tifton, GA

The Bugwood Network is becoming the Center for Invasive Species & Ecosystem Health at the University of Georgia. The mission of the Center is to serve a lead role in development, consolidation and dissemination of information and programs focused on invasive species, forest health, natural resource and agricultural management through technology development, program implementation, training, applied research and public awareness at the state, regional, national and international levels.
This presentation will introduce the Center and provide information about Center projects including: EDDMapS, Invasive.org, and Invasive Plants of the United States DVD-ROM.

THE NORTH CAROLINA SANDHILLS WEED MANAGEMENT AREA: FACILITATING REGIONAL, INVASIVE PLANT MANAGEMENT PARTNERSHIPS AMONG NEIGHBORING LAND STEWARDS. North Carolina Sandhills Weed Management Area, Southern Pines, NC

The North Carolina Sandhills Weed Management Area (NCSWMA) is composed of federal, state, and local agencies working with public and private landowners in an effort to control noxious and invasive weeds from causing ecological and economic damage in the region. The NCSWMA strives to facilitate cooperation among members, which benefit from coordinated efforts, as well as shared information, resources and expertise. Some of the many important activities of the NCSWMA include education, public outreach, regional prioritization, fundraising, rapid response control initiatives and early detection of invasive weeds not yet widely distributed in the region. With only five percent of the historic longleaf pine-wiregrass ecosystem remaining today, public and private landowners in the North Carolina Sandhills play an important role in conserving rare species diversity. The region not only provides habitat for five federally endangered species, it also supports numerous state-listed and federal species of concern, many of which are endemic. Unfortunately, at least 51 non-native invasive plant species (NIS) have already been confirmed to occur in the Sandhills of North Carolina. Since this is only a subset of the NIS projected to potentially occur in the Sandhills, the number of NIS and infestations impacting the region will undoubtedly increase without proactive management efforts. As the premier Weed Management Area in North Carolina, the NCSWMA is striving to provide the partnerships, shared responsibilities, increased efficiency, and collective vision necessary for successful regional NIS management.

SEASONAL BIOMASS DETECTION OF WATERHYACINTH USING NORMALIZED DIFFERENCE VEGETATION INDEX DERIVED FROM LANDSAT 5 TM SIMULATED DATA. Wilfredo Robles and John D. Madsen, GeoResources Institute, Mississippi State University, Starkville, MS

Detection of seasonal biomass patterns is useful for making accurate decisions and selecting the best timing to apply any control methods used in an aquatic plant control program. Large waterbodies require significant amounts of labor to perform ground-truth surveys. However, this problem may be addressed with the use of remote sensing which provides both temporal and spatial information from a target area. Studies were conducted at Lakes Columbus and Aberdeen (Mississippi) during the growing seasons of 2005 and 2006 to detect seasonal biomass patterns of waterhyacinth and correlate it with the normalized difference vegetation index (NDVI) derived from Landsat 5 TM simulated data. A quadrat (0.10 m^2) placed 25 times at each site was used to collect and determine monthly biomass. Reflectance measurements using an Analytical Spectral Device were taken every month. All statistical analysis was conducted in SAS. Reflectance measurements were transformed into a Landsat 5 TM simulated data set using MatLab® software. A significant relationship (r^2 = 0.28) exists between ground-truth biomass of waterhyacinth and NDVI values from the simulated dataset. Maximum biomass was reached between July and September in both growing seasons which corresponds with maximum NDVI values of 0.93-0.94. The opposite pattern occurred between October and May. Therefore, waterhyacinth seasonal biomass patterns may be tracked with an NDVI composite from Landsat 5 TM.

CURRENT DISTRIBUTION OF GIANT SALVINIA AND HYDRILLA IN MISSISSIPPI: THREE YEARS SURVEYING. Wilfredo Robles, John D. Madsen, Victor L. Maddox, and Ryan M. Wersal, GeoResources Institute, Mississippi State University, Starkville, MS

In the state of Mississippi, water bodies are mainly used for transportation, recreation, and habitat for fish and wildlife; all of which are threatened with the introduction of invasive aquatic plant species. The two species, giant salvinia (*Salvinia molesta*) and hydrilla (*Hydrilla verticillata*), are considered invasive aquatic plants worldwide. Both plants are listed as noxious weeds on both the Federal Noxious Weed List and the Noxious Weed List for the State of Mississippi. Implementation of monitoring and management programs is needed for early detection of and prevention of their introduction, establishment and spread in any water body. Pursuant to that, statewide surveys have been conducted since 2005 in the state of Mississippi to detect the presence and absence of giant salvinia and hydrilla. A handheld computer with Global Position System (GPS) capabilities has used to obtain geographic coordinates of surveyed locations and report the status of these two species. To date in 2008, a total of 37 counties have been surveyed including reservoirs, waterways and major rivers. The giant salvinia population in the Pascagoula River delta reported in 2005 before Hurricane Katrina has not reestablished according to extensive surveys in 2006 and 2007. However, giant salvinia still persists in Wedgeworth Creek, Forrest County, MS. It was found at the mouth of Wedgeworth Creek which drains into the Leaf River. It is likely to spread into the Leaf River, so additional surveys in the future are warranted. Since 2005, hydrilla has been found at lakes Columbus, Aberdeen, Aliceville, and Gainesville which belongs to the Tennessee- Tombigbee Waterway. Populations at those lakes still persist and are well established. At all lakes, hydrilla is localized next to boat ramps and small coves. A hydrilla population at the Ross Barnett Reservoir is located in the northern portion of the lake covering a total of 407 acres. Since 2005, hydrilla at the Ross Barnett Reservoir has been under management using herbicides successfully limiting its establishment. However, water bodies at the Tennessee-Tombigbee Waterway have not been under management. Therefore, the implementation of a hydrilla management plan at those water bodies is highly recommended to suppress hydrilla populations and prevent future spread to nearby water bodies. Further surveys are recommended in order to monitor and prevent the establishment of giant salvinia in southeast Mississippi. Many southward tributaries related with the

Leaf River located in Perry, Greene, George and Jackson counties have been surveyed, however, giant salvinia have not been found in any of them.

ROLE OF NATURAL AND ANTHROPOGENIC DISTURBANCE IN EXOTIC INVASIONS: PREDICTING INVASION DYNAMICS OF *LYGODIUM JAPONICUM* USING ECOLOGICAL NICHE MODELING. Nitesh Tripathi and Shibu Jose, School of Forest Resources and Conservation, University of Florida, Gainesville, FL

L. japonicum (Japanese climbing fern) is a serious exotic pest threatening forests of the southeastern US. Japanese climbing fern is a perennial climbing fern native to eastern Asia. In Florida, it is mostly found in the north. We evaluated the effects of both natural and human induced disturbances on the establishment and spread of *L. japonicum*. Specifically, we examined how fire and hurricanes influenced the spread rates and patterns using ecological niche modeling. The Blackwater River State forest, a 195,000 acres forest in northwestern Florida that was hit by these two major hurricanes (Ivan -2004 and Dennis -2005) was used as the study area.
A total of 534 *L. japonicum* occurrence points were used for the modeling activity. Niches of cogongrass were modeled in ecological space and niches were projected onto landscapes with potential for invasion. Results indicated that disturbance events, irrespective of natural or human resulted in significant expansion of *L. japonicum* compared to undisturbed areas. Disturbance events, in general, can exacerbate the invasion of exotic plants like *L. japonicum* with serious consequences for the invaded communities. Identifying vulnerable sites and treating existing infestations beforehand may help combat the issue to a certain extent.

AERIAL SKETCH MAPPING AND RELATED TECHNOLOGY ASSESSMENT TOOLS. Allen Van Valkenberg, Mississippi Forestry Commission

MISSISSIPPI FIELD TRIAL OF KUDZU CONTROL STRATEGIES. M.A. Weaver, W.T. Molin, C.D. Boyette, and R.E. Hoagland, USDA ARS Southern Weed Science Research Unit. Stoneville, MS

Replicated field trials at two Mississippi sites evaluated broadcast, post-emergence herbicides and mowing for efficacy as preliminary steps towards kudzu eradication. Herbicides were applied to natural infestations of kudzu in September and July at the maximum labeled rates in 61 L ha -1 total volume with 0.25% nonionic surfactant using a boomless spray rig equipped with a TeeJet TFW-12 nozzle. Efficacy was measured 2 and 4 weeks after application by collecting green plant matter in the treated areas, determining dry weight reductions compared to adjacent, untreated areas. Commercial formulations of aminopyralid, fluroxypyr, metsulfuron, and triclopyr gave better than 95% control at four weeks after application. Glyphosate was more effective in late season than mid season applications. None of these treatments should be expected to result in kudzu eradication, but might be effective first measures in an integrated control program. These herbicides might reduce kudzu density and plant vigor, making the site more manageable by biological control agents.

COMPARISON OF SUBSURFACE AND FOLIAR HERBICIDE APPLICATIONS FOR CONTROL OF PARROTFEATHER (*MYRIOPHYLLUM AQUATICUM* VELL. VERDC.). Ryan M. Wersal and John D. Madsen; GeoResources Institute, Mississippi State University, Starkville, MS

Parrotfeather is an invasive aquatic plant that is native to South America. Parrotfeather has caused major problems in water-bodies in the United States, where infestations have reduced access, use, and runoff in ditches, streams, ponds, and shallow lakes. Parrotfeather is difficult to control and thrives in a variety of environmental conditions in addition to deploying management techniques. Our objectives were to examine the efficacy of subsurface applications of seven herbicides labeled for aquatic use and to compare those applications to herbicides that can also be applied to foliage. A replicated mesocosm study was conducted in 378 L tanks beginning in August 2007. The maximum and half maximum labeled rates of copper, diquat (6,7-dihydrodipyrido (1,2-a:2',1'-c) pyrazinediium dibromide), endothall (7-oxabicyclo [2.2.1]heptane-2,3-decarboxylic acid), fluridone (1-methyl-3-phynyl-5-[3-(trifluoromethyl)phenyl]-4(1H)-pyridinone), triclopyr (3,5,6-trichloro-2-pyridinyloxyacetic acid), 2, 4-D (2,4-dichlorophenoxyacetic acid), and carfentrazone (a,2-dichloro-5-[4-(difluoromethyl)-4,5-dihydro-3-methyl-5-oxo-1*H*-1,2,4-triazol-1-yl]-4-fluorobenzenepropanoic acid, ethyl ester) were applied to designated tanks allowing for a 48 hour exposure time. Fluridone was applied as a static exposure. The maximum labeled rate for foliar applications of diquat, triclopyr, and 2,4-D were used to compare treatment methods. Parrotfeather was rated weekly for percent control for six weeks. At six weeks after treatment (WAT), healthy plant material was harvested, dried, and weighed to determine plant mass. Analyses were conducted using a Kruskal-Wallis test and means separated by the Student-Newman-Keuls method at a $p=0.05$ level of significance. Six WAT, copper, endothall, fluridone, and carfentrazone were not efficacious in controlling parrotfeather. Diquat at all rates and treatment methods significantly ($p<0.01$) reduced parrotfeather mass. Triclopyr as a subsurface treatment at 2.5 mg ae L^{-1} and as a foliar treatment significantly ($p<0.01$) reduced parrotfeather mass. Only the foliar treatment of 2,4-D resulted in acceptable control of parrotfeather. However, regrowth was evident in all treatments and plants would have recovered given sufficient time. According to our results the efficacy of subsurface applications was similar when compared to foliar applications. Future work needs to identify possible herbicide combinations and or application timings that could maximize treatment efficacy; as one herbicide and one application was not sufficient to control parrotfeather.

ASSESSING HERBICIDE EFFICACY AND AQUATIC PLANT COMMUNITY CHANGES IN THE ROSS BARNETT RESERVOIR, MS. Wersal, R.M[1], J.D. Madsen[1] and M.L. Tagert[2]; [1]GeoResouces Institute, Mississippi State University, [2]Mississippi Water Resources Research Institute, Mississippi State University, Starkville, MS

Invasive aquatic plants are an increasing problem in waterways throughout the United States by directly impacting navigation, drainage, fishing, water quality, fish and wildlife habitat, and the aesthetics of an area. In Mississippi, the Ross Barnett Reservoir as it is the largest surface water impoundment and the primary source of potable water for the city of Jackson. Point intercept surveys were conducted in 2005, 2006, and 2007 to assess long term changes in the aquatic plant community and to assess herbicide control of hydrilla (*Hydrilla verticillata*). Surveys were conducted on a 300-meter grid using hand held computers enabled with GPS technology. We observed 23 species of aquatic or riparian plants during the surveys; of those, 6 are non-native species. The frequency of occurrence for waterhyacinth and alligatorweed decreased ($p \leq 0.01$) from 2005 to 2007. The frequency of occurrence

for waterhyacinth in 2005 was 4.9% and declined to 2.9% and 1.2% in 2006 and 2007, respectively (Table 2). The occurrence of alligatorweed was reduced from 21.1% in 2005 to 3.9% in 2006 and to 4.0% in 2007; almost an 80% reduction in occurrence. The occurrence of native species did not change between years, indicating that non-native species are being selectively removed with little impact on the native plant community. Management of hydrilla has been successful in minimizing the spread of this weed and preventing the production of tubers. While managing the weed is expensive, the cost is much less than the potential cost if hydrilla were to spread in the Ross Barnett Reservoir.

MONITORING NON-NATIVE PLANT POPULATIONS IN THE ROSS BARNETT RESERVOIR, MS. Ryan M. Wersal[1], J.D. Madsen[1] and M.L. Tagert[2]; [1]GeoResouces Institute, Mississippi State University, [2] Mississippi Water Resources Research Institute, Mississippi State University, Starkville, MS

As the threat of non-native plant species increases, the development and refining of methods to rapidly detect, monitor and ultimately control these species to mitigate negative impacts is critical. An area of concern is the largest surface water impoundment in Mississippi, the Ross Barnett Reservoir. The reservoir encompasses 33,000 acres with over 10,000 acres of suitable habitat for plant growth. To assess the extent of non-native plant infestations within the Reservoir we implemented point intercept surveys in 2005, 2006, and 2007, sampling more than 2,600 points over the three years. Hydrilla was first observed in the reservoir in 2005 and in 2006 had a frequency of occurrence of 0.8%. The presence of hydrilla increased to 1.4% in 2007, however more than 161 acres have been removed from the reservoir. Waterhyacinth had a frequency of occurrence of 5.0% in 2005 and was significantly ($p < 0.01$) reduced to 2.9% in 2006 and 1.2% in 2007. The estimated coverage of waterhyacinth was reduced from 333 acres in 2005 to 111 acres in 2007, through aggressive management. Alligatorweed was observed at 21.0% of sample points in 2005 and was significantly ($p < 0.01$) reduced to 4.0% in 2006 and 2007. The estimated coverage of alligatorweed was 3,170 acres in 2005 and with aggressive management was reduced to 377 acres in 2007. Two other non-native species that are currently being monitored are parrotfeather (*Myriophyllum aquaticum*) and brittle naiad (*Najas minor*). Parrotfeather had a frequency of occurrence 0.7% in 2005 and 0.2% in 2007, and due to the size and openness of the reservoir it is unlikely that this species will become a wide spread problem. Brittle naiad was observed for the first time in 2007 at 2.0% of sample points. It is unclear if this species will become problematic, but coverage was estimated at 178 acres, second in coverage to alligatorweed. If the current trend in low water depths continues it would favor the reproduction of brittle naiad as an annual. Continued monitoring and assessment is crucial to understanding the dynamics of the aquatic plant community and to measure the success of a management program.

COMPARISON OF IMAZAPYR AND IMAZAMOX FOR CONTROL OF PARROTFEATHER (*MYRIOPHYLLUM AQUATICUM* (VELL.) VERDC.). Wersal, R.M and J.D. Madsen; GeoResources Institute, Mississippi State University, Starkville, MS

Parrotfeather infestations can impede navigation, stream flow, and runoff to such an extent that flooding of adjacent lands occurs and provides mosquito larvae a refuge from predation indirectly aiding in the spread of insect born diseases. Parrotfeather is difficult to control and usually persists in spite the deployment of management techniques. The use of a systemic herbicide may offer greater efficacy on

parrotfeather. Therefore, the objective of this study was to evaluate the efficacy of Imazapyr (2-[4,5-dihydro-4-methyl-4-(1-methylethyl)5-oxo-1H-imazol-2-yl]-3-pyridinecarboxylic acid) and imazamox, 2-(4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H imidazol-2-yl]-5-(methoxymethyl)-3-pyridinecarboxylic acid) on parrotfeather. The study was conducted as a randomized complete block design with three rates of imazapyr (1.123, 0.584, 0.281 kg ai ha^{-1}), three rates of imazamox (0.561, 0.281, 0.140 kg ai ha^{-1}), and an untreated reference in 378 L tanks. Foliar herbicide treatments were made using a CO_2 pressurized backpack sprayer at a rate of 187 L ha^{-1}. A non-ionic surfactant was added to the spray mixture at a rate of 0.25% v:v. At the conclusion 10 weeks, parrotfeather biomass was reduced ($p \leq 0.01$) when treated with the highest rates of imazapyr and imazamox. Parrotfeather treated with the highest rates of imazapyr had percent control ratings of 100 percent. Parrotfeather treated with imazamox had ratings of 53 and 46 percent respectively, but were still different from the untreated reference. Our study indicates that imazapyr was most effective at controlling parrotfeather after ten weeks; imazamox activity was observed, however, regrowth was evident.

CONCEPTUAL FRAMEWORK FOR A BIOLOGICAL PROTECTION ETHIC ON THE INTRODUCTION, USE, AND SPREAD OF EXOTIC PLANTS AND ANIMALS IN THE UNITED STATES.

Randy G. Westbrooks, USGS BRD, Whiteville, NC; John D. Madsen, Mississippi State University, Starkville, MS; and Leslie J. Mehrhoff, University of Connecticut, Storrs, CT

Since the advent of European colonization in the early 1500s, at least 50,000 plants and animals have been intentionally introduced into North America for various reasons. While most of these species are clearly beneficial in some way, over 4,000 introduced plants have established free living populations outside of cultivation (John Kartesz, Biota of North America Program, Chapel Hill, NC). These represent the current pool of introduced species that have or may become invasive in the future. Since estimated losses and control costs attributed to invasive plants now exceed $30 billion, and about 2/3 of documented invasive plants are intentionally introduced, it is clear that we need to make better decisions on the introduction and use of exotic species in the United States.

In spite of improved methods for predicting invasiveness of introduced plants by noted scientists such as Sarah Reichard (University of Washington) and Marcel Rejmanek (UC-Davis) over the last decade, a number of prominent scientists have concluded that the only sure way to tell if a species will be invasive in some habitats is whether it has a history of invasiveness. But even this approach is not fool proof. Beach vitex (*Vitex rotundifolia* L.), which is now a major threat to dune ecosystems along the south Atlantic coast in the Carolinas, had no history of being invasive when it was introduced from the beaches of Korea as a dune stabilization and ornamental plant by the North Carolina State University Arboretum in the mid-1980s. Beach vitex has now joined the ranks of 28,000+ species that are now recognized by Australian Plant Profiler, Rod Randall, as being invasive somewhere in the world. In 1985, no one could imagine that this introduced woody vine would become such a problem along the Carolina coast.

The need to minimize this problem compels us to continue working diligently to prevent the introduction and spread of invasive plants without putting a damper on responsible free trade by the nursery and landscape industry, or the desire to beautify our managed landscapes with new and beautiful exotic plants. However, unless we are able to minimize further introductions of invasive plants, the only thing for certain is that we will be spending more and more money to control

intentionally introduced species gone awry. Since this is a public policy issue that affects society at large, we believe it would be better to prevent such problems through informed choices (a proactive strategy) rather than depending on public agencies and resource conservation organizations to address them if they do become a problem in the future (a reactive and expensive strategy).

In order to minimize the need for additional regulations on the plant nursery and landscape industry, which would seriously limit personal choice in the yard and garden, it seems that the best approach for minimizing future problems with invasive species is through public education about the issue. What we need is widespread 'buy-in' for a biological protection ethic on the responsible use of introduced plants and animals. It is important to use species that won't escape and be continually spread through natural and artificial means.

OVERVIEW AND UPDATE ON ESTABLISHMENT OF STATE EDRR COORDINATING COMMITTEES IN SUPPORT OF THE NATIONAL EARLY DETECTION AND RAPID RESPONSE SYSTEM FOR INVASIVE PLANTS.

Randy G. Westbrooks (USGS BRD, Whiteville, NC), Robin Mackie (USDA Forest Service, Columbia, SC), John Madsen (Mississippi State University), and Leslie J. Mehrhoff (University of Connecticut)

Currently, a number of state interagency partner groups throughout the U.S. are working to prevent the establishment and spread of new invasive plants. This is part of the effort to develop a National Early Detection and Rapid Response (EDRR) System for Invasive Plants. In 2007, the South Carolina Exotic Pest Plant Council formed an Early Detection and Rapid Response Coordinating Committee, and is currently developing a State EDRR Work Plan. The plan outlines individual roles and steps that should be taken to prevent the establishment and spread of new plant invaders in South Carolina – particularly non-regulated species [such as bush killer (*Cayratia japonica*) a new invasive vine in North Carolina]. The South Carolina EDRR Plan was adapted from a generic EDRR work plan that has been developed over the past eight years to assist EDRR partner groups throughout the U.S. and Canada.

Key steps in developing a State EDRR network include:
1) **Establish a State EDRR Coordinating Committee** – This includes field specialists with expertise in volunteer recruitment and training, identification and vouchering (botanists), rapid assessment and rapid response (state and federal scientists), state and federal weed regulatory officials, as well as representatives from representative public and private land management agencies and organizations.
2) **Develop a list of EDRR target species -** Include all state and federally listed species that occur in adjacent states, known invasives that occur at only one to two sites within the state, as well as other new and emerging species that aren't being otherwise addressed.
3) **Develop and train an Early Detection and Reporting Network –** This is a network of volunteers (e.g., native plant society members, friends groups, etc.) and agency field personnel (botanists, field biologists, etc.) established to enhance detection and reporting of new invaders.
4) **Report suspected new plants to designated state and federal officials** – E.g., The State Weed Coordinator, USDA APHIS PPQ, and etc.**.**
5) **Submit voucher specimens of new invasive plants to partner herbaria for identification and vouchering –** This includes new county, state, and national records.

6) **Archive confirmed new invasive plant records in Regional Invasive Plant Databases -** Regional Databases in the Southeast include the Invasive Plant Atlas of the Mid-South (Mississippi State University) and EDDMaps (Southeast EPPC).
7). **Conduct Rapid Assessments -** For exotic plants with free living populations that don't have a clear history of invasiveness (e.g., beach vitex in South Carolina), it is very important to quickly determine what resources are at risk, and what should be done about them. USGS, IPANE, and IPAMS are developing a rapid assessment process for new invasive plants.
8) **Rapid Response - Don't Hesitate, Weeds Won't Wait!** - For confirmed new invaders with a long history of invasiveness elsewhere [e.g., giant salvinia (*Salvinia molesta*)], it is important to establish a task force (e.g., the Carolinas Beach Vitex Task Force), pool available resources, and take immediate action.

Connecting the dots – *getting agencies and organizations to work together* – is the key to success in EDRR at all levels – from the international to the local level! No single agency has the resources, expertise, or authority to address all types of invasive plants. What we do this year and next year to prevent the establishment and spread of new invasive plants throughout the southeastern U.S. will have a big impact on our natural and managed resources for decades to come!