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The mission of the Exotic Pest Plant Councils is to support the management of invasive exotic plants in natural areas by providing a forum for the exchange of scientific, educational and technical information.

An **exotic plant** has been introduced, either purposefully or accidentally, from outside of its natural range. A **naturalized exotic plant** is one that sustains itself outside of cultivation (it is still exotic; it has not “become” native). An **invasive exotic plant** not only has become naturalized, but it is expanding its range in native plant communities.

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### On the Cover:

*Bonellia macrocarpa* was introduced to Fairchild Tropical Botanic Garden from mountainous regions in the Mexican states of Yucatan and Chiapas. It subsequently spread and has required removal from the garden. See the article on page 4. *Photo by Jennifer Possley, Fairchild Tropical Botanic Garden*

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# Reconciling Plant Introduction and Conservation at Fairchild Tropical Botanic Garden

by Hillary Burgess and Jennifer Possley

Fairchild Tropical Botanic Garden (FTBG) has introduced over 15,000 exotic plants to South Florida since it opened in 1938. Many botanic gardens, including Miami's FTBG, hold plant conservation as a guiding component of their mission. Recognizing that invasive species are a major threat to worldwide biodiversity, these institutions have an opportunity to educate the public about invasive species issues and a duty to set a positive example. FTBG was founded in honor of Dr. David Fairchild, creator of the Section of Foreign Seed and Plant Introduction of the United States Department of Agriculture in 1897. Dr. Fairchild's ambition was to search the world for beautiful and useful plants and to introduce them to our country's economic and aesthetic landscape. This tradition of plant exploration and introduction remains a strong part of the garden's character today. What has evolved is an awareness of the impacts of invasive species and a commitment to responsibly manage the plant collection accordingly. FTBG's approach is focused on the following questions:

1. Prior to introducing a new species to the Garden's collection, how can invasiveness, or potential invasiveness, be screened?
2. How can plants that are already a part of the collection be evaluated for potential invasiveness?
3. How should known invasive species be managed in the garden?
4. And lastly, how can FTBG staff ensure that potentially invasive plants are not distributed to the greater community?



Fairchild staff and volunteers remove *Bonellia macrocarpa* from FTBG property.

ARLENE FERRIS

## ***Bonellia macrocarpa*** (see cover photograph)

In the 1930s and 40s, Fairchild horticulturists collected several specimens of the shrub *Bonellia macrocarpa* from mountainous regions in the Mexican states of Yucatan and Chiapas. In the ensuing years, approximately ten were planted for display in Fairchild Tropical Botanic Garden, where they flourished for decades. In 1995, Keith Bradley from The Institute for Regional Conservation deposited plant specimens into the Fairchild Herbarium, documenting the escape of *B. macrocarpa* into lake margins in Fairchild's lowlands and in two neighboring Miami-Dade County preserves that share borders with Fairchild. Dispersal of the fleshy, orange fruits of *B. macrocarpa* likely was aided by raccoons and other animals.

*Bonellia macrocarpa*, a member of the plant family Theophrastaceae, is a variable species that has also been classified as *Jacquinia aurantiaca*, *Jacquinia macrocarpa* and other synonyms. We began removing plants classified under the name *Jacquinia aurantiaca* when they were found to be invasive. The scope of our removal efforts increased as we learned more about the taxonomy of this species complex. The last remaining cultivated plants were removed in 2009, and we are well on our way toward removal of all naturalized plants as well. Everglades Cooperative Invasive Species Management Area (ECISMA) team members gave us a strong head start, and FTBG staff volunteers now remove *B. macrocarpa* on a weekly basis, pulling seedlings by hand or using a cut-stump method of herbicide application using 50% Renovate (triclopyr) diluted in water. Fairchild staff will need to—and intend to—remove *B. macrocarpa* seedlings and runners from the garden for years to come.

Conscientious collecting, purchasing, and trading of plant material are key to FTBG's approach to screening out potentially invasive species. Staff members adhere to all importation laws and FTBG's collection policy, which states that we not collect "plant species known or suspected to be invasive in South Florida's natural areas." When any plant material is brought to the garden, background research is performed to ensure that it is not a known pest plant in our region. The Florida Exotic Pest Plant Council (FLEPPC) List of Invasive Plant Species, the University of Florida-IFAS Center for Aquatic and Invasive Plants, and The Institute for Regional Conservation's Floristic Database Online are invaluable tools in this effort. When collecting from the wild, horticulturalists also avoid plants that are growing abundantly in disturbed places or appear weedy in habit. We are also working on protocol to collect data at the time of plant collection that will feed into the Australian Weed Risk Assessment's Predictive Tool adapted for Florida by the IFAS Invasive Plant Working Group (Gordon et al. 2008), the IFAS Assessment of Non-Native Plants in Florida's Natural Areas. When possible these data will inform decisions on the importation and retention of new plant material.

Once a plant is brought to Fairchild's nursery or public landscape, it becomes a part of the plant collection. From that point, the plant is observed for horticultural characteristics of interest, including weediness. It may take many years for such signs to develop. If a plant is noted to be spreading and difficult to control, it is removed from the collection and seedlings are destroyed. In some cases these plants are valued horticultural specimens. Such was the case with *Haematoxylum campechianum* and *Picrodendron macrocarpum*. Both species were enjoyed in the collection for decades until signs of weediness were observed. The plants were subsequently removed. Most recently FTBG staff members have been controlling the shrubs *Bonellia macrocarpa* and *Lumnitzera racemosa* (see sidebars). These escapes have highlighted the importance of early detection, and are an impetus for more diligent monitoring, evaluation, and editing of the plant collection. Thankfully, the majority of our introduced species have not been aggressive, and can serve as ambassadors to the tropics for visiting scientists and the general public.

As for known invasive plants, FTBG staff uses the FLEPPC List to set priorities for removal of specimens and volunteers from the garden. Since the 1980s, Fairchild staff have

worked to control invasives on the property. Initial efforts targeted the usual suspects – *Schinus terebinthifolius*, *Casuarina equisetifolia*, and *Melaleuca quinquenervia*. Though the parent plants are long gone, we continue to remove seedlings of these species on a regular basis.

Current efforts include a complete evaluation of all FLEPPC listed species in the garden, with plans to remove most, and mitigate the risk of others. Two staff members now lead crews of weekly volunteers that are dedicated to the removal of invasive species. One of these is Rob Ziebro, who has worked several days per week since 2001 on the removal of species such as those listed above, as well as *Colubrina asiatica*, *Rhoeo spathacea*, *Dioscorea bulbifera*, *Wedelia trilobata*, and *Ardisia elliptica*. FTBG staff want to avoid unintentionally promoting these plants as ornamental options to the community.

Since its inception, the garden has introduced new plants to the South Florida community via annual sales and seed distribution programs. Staff members also promote the use of certain plants through articles, classes, web resources for home gardeners, and our Plant of the Year Program. The final question of managing for invasive plants comes at this stage of distribution and promotion. The fact is that the majority of pest plants in Florida were introduced for ornamental or economic interest at a time when there was less regard for Florida's natu-



Fairchild staff and volunteers remove *Rhoeo spathacea* (syn. *Tradescantia spathacea*) from FTBG property.

MARTINE GOURMELON



*Lumnitzera racemosa* flowers and foliage.

### ***Lumnitzera racemosa***

*Lumnitzera racemosa* (Combretaceae) is a mangrove tree species that Fairchild horticulturists collected from southeast Asia during a 1960s collecting expedition. By the early 1970s, fourteen individuals were planted for display in the Garden. Over the subsequent decades, *L. racemosa* spread into native mangrove habitat surrounding Fairchild. Because mangrove habitat floods with the tides, the floating seeds of *L. racemosa* were carried out into the adjacent mangrove habitat. The invasion went virtually unnoticed for years – not surprising, given that *Lumnitzera racemosa* looks very similar to our native white mangrove (*Laguncularia racemosa*, also Combretaceae), and that few people, let alone those with plant taxonomy skills, ever venture in to the interior of our neighboring mangrove forests.

In 2008, a group of scientists from the U.S. Geological Survey (USGS) and Florida International University visited Fairchild to survey our lowlands for naturalized mangrove species. While they found that most of the introduced mangroves had not spread, USGS scientist and mangrove expert Dr. Thomas J. Smith noticed that *Lumnitzera racemosa* had become invasive. It had spread to cover approximately 15 acres. Though it did not form a monoculture, some areas had very dense seedlings. On the bright side, the infestation appeared to be contained by a grid-like network of mosquito ditches surrounding Fairchild.

On three dates in spring 2009, ECISMA held removal events at FTBG focusing on *L. racemosa*. Over 50 volunteers from all over Florida succeeded in ridding FTBG property of this aggressive tree. By the second and third day, volunteers began working into Matheson Hammock Park, which contained the densest part of the infestation. The group focused on reproductive individuals, but it soon became apparent that additional work would be needed to eradicate all juvenile plants. We continue to work with partner agencies to control *L. racemosa*. Most recently, Lake and Wetland Management, Inc. in Delray Beach has made a generous offer to donate staff time to remove a portion of the infestation, following the results of herbicide trials.

ral beauty and the value and integrity of its ecosystems. Botanic gardens and other plant importers need to do their best to ensure that plants which are being introduced today do not become pest plants tomorrow.

Since the 1970s, plants at FTBG that have been chosen for distribution are carefully observed for invasive characteristics, and are often test planted in home gardens. More recently, researchers and horticulturalists have begun collaborating on the use of the Australian Weed Risk Assessment's Predictive Tool adapted for Florida by IFAS (Gordon et al. 2008). Dr. Hong Liu, a researcher and faculty member at Florida International University, is spearheading these efforts at FTBG. The end goal of this process is to establish the WRA as an important tool in our ongoing evaluation of the plant collection—especially for those species that we intend to promote and distribute to the community.

A recent milestone is FTBG's endorsement of the Voluntary Codes of Conduct for Botanic Gardens and Arboreta. These codes were developed by the Center for Plant Conservation ([www.centerforplantconservation.org](http://www.centerforplantconservation.org)), and outline an ethic and methods of addressing invasive plants. They will serve as guidelines for FTBG's future efforts to manage our collections responsibly.

### **Acknowledgments**

Maintaining open communications with taxonomists, land managers, plant ecologists, and other experts has been crucial to our recent eradication efforts. The authors would like to thank their colleagues at Fairchild, ECISMA, Miami-Dade County Environmentally Endangered Lands and Natural Areas Management programs, USGS, FIU, and Lake and Wetland Management, Inc. for cooperative efforts to remove these two invasive species.

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# Non-native Invasive Plants and Real Estate Values: The Search for New Opportunities to Address Invasive Species Problems

by Matt Nespeca



Invasive plants are not often considered by the same people who study real estate values. But what may sound like an odd combination of topics might actually be of benefit to both groups.

As professionals that deal with forests, grasslands, and wetlands, it is easier for many of us to understand the ecological landscape than it is to understand the societal fabric that drives the private land ownership in our respective neighborhoods. In a region like the Southeastern US, where over 80% of the land is privately owned, many of our natural areas and preserves are inholdings within a fragmented and sometimes changing complex of residential development, industrial forestland, investment tracts and family owners. The threat of economic, aesthetic and ecological damage due to invasive plants is not understood by many who control private lands in the Southeast, but the potential for losses on these properties (whether realized or unrealized) is severe.

There have been many situations where invasive plants have been shown to damage real estate values. In the western plains, leafy spurge infestations were found to reduce the property value of rangelands by as much as 83% (Weiser, 1997). In lake communities in the Southeast, extreme hydrilla infestations have been found to reduce lakefront property values (Bell, 2004; Driscoll, 1994). In southeastern for-

estlands, the cost of controlling kudzu often exceeds the land value (Britton, 2002), making kudzu control uneconomical for forest investment owners. Few studies have been done to analyze the real estate value losses associated with terrestrial invasive plants in the Southeast, but there is a general consensus among those who deal with invasive plants that property value losses due to invasive plants can be very real.

From 2002 to 2007, 27.4 million acres of forests in the US were sold in major forestland transactions, worth an estimated \$30 billion in land value (Bliss et al, 2008). In addition to the enormous transactions occurring within forest industry, smaller land parcels continue to be bought and sold within the rural urban interface and rural areas of the Southeast. These transactions almost always raise anxiety among conservation organizations and government agencies, mainly due to the continued threat of residential and commercial development as well as forest fragmentation within important ecoregions. The increased rate of land transactions does not always lead to land conversion; in fact, most of the large forestland transactions only represent changes in ownership, with the current land uses (such as forest production) being maintained by new and different ownership groups. Extensive land sales in the past 5 years have also led to important land conservation transactions, such as the International Paper land disposition in 2006, where conservation organizations

If we know that invasive plants are a major environmental and economic threat within our landscapes, and the major tracts of land within these landscapes are transferring ownership on a regular basis, there is potential to utilize the real estate transaction process as an opportunity to motivate invasive plant control efforts.

such as The Nature Conservancy and The Conservation Fund were able to partner with state and federal agencies to protect 218,000 acres of important conservation targets throughout the Southeastern US.

If we know that invasive plants are a major environmental and economic threat within our landscapes, and the major tracts of land within these landscapes are transferring ownership on a regular basis, there is potential to utilize the real estate transaction process as an opportunity to motivate invasive plant control efforts.

Several types of professionals are involved in real estate transactions, including but not limited to land appraisers, real estate agents, loan officers, land planners and environmental consultants. When a piece of land is put under contract by a potential buyer, there is usually a due diligence period where the buyer can hire professionals to determine if the property is suitable for the desired future use of the property, and if the property is worth the contract price.

With the residential home market, it is common for problem pests like Formosan termites to exist, and a buyer identifies the problem during the due diligence process. There are standardized procedures in the residential home market such as wood destroying organism reports, roof inspections, and home inspections that protect buyers and lenders. As with many residential home purchases, there are plenty of reasons that buyers and sellers of land would want to be informed about potential impacts to value.

Below are several scenarios that describe how destructive non-native invasive plants could be identified and addressed during the real estate due diligence process. Not all invasive plants are destructive from a utilization or an aesthetic viewpoint, so only the most obvious and damaging invasives may be addressed during real estate transactions.

### Land Appraisal Example

For most large real estate transactions, the buyer as well as the lender will require a land appraisal to validate the land investment. The following is an example of how a land appraiser could add value to a real estate transaction if they had knowledge of the impacts of invasives:

A potential buyer puts a 1000 acre tract of forestland under contract with a seller for \$2,000,000 (or \$2000/acre) with plans to own the property as a long-term investment.

In the purchase agreement, the buyer is given 60 days of due diligence to review the property before he must fully commit to the purchase.

The buyer contracts with a land appraiser to determine the value of the land to insure that he is getting the property for a fair market price.

The land appraiser does a comparable sales approach appraisal (one method to valuing land), and finds three comparable properties of similar size, proximity and features.

When reviewing the tract, the appraiser finds that 50 acres of the property is infested with kudzu. The three comparable properties do not have any kudzu infestations. Because the appraiser is aware of the major problems that kudzu can cause, she contacts a local invasive plant control contractor to determine what it would cost to rid the property of kudzu. The contractor determines that the 50 acre kudzu patch will take four years to control, and cost a total of \$75,000.

In her appraisal report, the appraiser provides all of the relevant information on the tract, including the support information on the location of the kudzu infestation and the potential costs associated with controlling it.

The potential buyer realizes that the property has a \$75,000 problem on it, and re-negotiates the contract with the seller to adjust the price of the property down by this amount, and can now use the savings to control the kudzu.

Appraisers collect a lot of different information to determine the value of a property. An appraiser does not have to be an invasive plant expert, but if he/she is able to recognize the signs of a serious invasive plant infestation, experts in invasive plant control can be brought in to evaluate the problem. The buyer can be protected more fully and have a more accurate assessment of the land value.

**What would happen if this kudzu patch was not addressed during the real estate transaction? How would this affect the buyer?**

If the buyer was left unaware of the kudzu problem, the losses over time could be extreme. The assumptions above state that the buyer was interested in “long-term investment” for this piece of land, and kudzu is capable of capturing acreage very quickly. For example, a kudzu vine can grow up to 60 feet a year. If a 50 acre kudzu patch was circular in shape, it would have a radius of 833 feet. If the kudzu patch is expanding by 60 feet in radius every year, this would mean that the 50 acre kudzu patch could potentially become a 148 acre patch in as few as ten years (assuming that there were no obstacles like rivers or closed canopy forests to slow it down). At the time of purchase, the kudzu patch

was assumed to have a control cost of \$75,000 (or \$1500 per acre). At the same per acre rate, ten years later, the 148 acre patch would have a control cost of \$222,000, which amounts to over 10% of the original purchase price! In addition to having an expensive kudzu problem, the property could also lose a significant amount of timber and timber growing capacity, as well as large impacts to the beauty and integrity of the land.

### Environmental Assessment Example

Using the same potential buyer, tract and price from the Land Appraisal example, let us consider the role of an environmental consultant. In many large land transactions, a buyer and lender will hire an environmental consultant to perform a Phase 1 Environmental Assessment. The purpose of this assessment is to determine if the property has specific environmental hazards on or near the property, like underground fuel storage tanks, dump sites, and dangerous materials that could impact the health of the property. In most large commercial real estate transactions, Phase 1 Environmental Assessments are required by the lender. Basically, when a bank backs a major land investment, they do not want any environmental surprises that could negatively affect the value of the property.

After putting the 1000 acre tract of land under contract, the buyer contracts with an environmental consultant to perform a Phase 1 Environmental Assessment.

The environmental consultant reviews courthouse records, property data, and data on the surrounding properties, and finds no records of environmental hazards.

The environmental consultant does a site inspection of the property. The 50 acre kudzu infestation is identified, and the patch is so dense that access is impossible.

The environmental consultant makes note of the large inaccessible kudzu infestation in the site inspection report.

In the report, the consultant could provide information on the detrimental effect that kudzu has on property. Currently, Phase 1 Environmental Assessments do not include invasive plants as environmental hazards, but it is easy to understand that large infestations of vines can hide environmental hazards. In fact, a pickup truck was lost for five nights after the driver swerved off an 18' embankment and landed 100' below in a deep ravine covered with kudzu. Although hundreds of people searched for five days, the noxious vine obscured the vehicle (*Wildland Weeds*, Winter 2008).

### What do we know about kudzu patches?

Kudzu was introduced to the US in the late 19<sup>th</sup> Century. In the 1930s, it was utilized extensively to reduce soil erosion in gullies and washed out areas. Back in the days before farmers and ranchers understood the importance of watershed protection, gullies were a common place for dumping waste, including old cars, tires, debris, etc. So now we must ask: "What is under that kudzu patch?" Not only are kudzu infestations difficult to access, they are also likely to be in areas where dumping may have occurred in past years.



DAVID J. MOORHEAD, UNIVERSITY OF GEORGIA, COURTESY OF BUGWOOD.ORG

*Kudzu infestation.*

### A Need To Explore and Educate

As with any problem that exists within our environment, it is impossible to make headway until the persons most affected by the problem become aware and educated. In the above examples, kudzu is used as an example of a problem that could impact the value of a property. Many other invasive plants that we are battling (such as cogongrass, Japanese climbing fern, and phragmites) can have similar impacts on the existing and future value of land. Examples of land appraisers and environmental consultants were used above, but other real estate professionals such as bank officers, real estate agents, land planners, and land developers could also become more engaged in the process. As a professional invasive plant control community, what are some of the tactics that we can use to build awareness of invasive plants during the real estate due diligence process?

Work with land appraisers and forest management professionals to develop models that account for the negative potential impacts of invasive plants, including the estimated control costs, land use losses as well as the growth pattern of specific invasive species. We know that kudzu can grow 60 feet per year, but we would need to incorporate many other biological, environmental and economic factors into a modeling effort to capture the dynamics of kudzu encroachment. Models such as this could be used by appraisers to inform buyers during the due diligence process.

Engage the banking community to insure they are aware of the negative impacts of invasive species on future land uses. If a property is a high risk for invasive plant infestations, lenders should be concerned about the success of any major land investment. Standardized due diligence processes for invasive plants could be developed as optional add-ons to environmental assessments or appraisals to insure that a tract of land is a sound investment.

*continued on page 10*



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Educate the land investment community on the problems with invasive plants. Current owners can become informed on the potential for devaluation of existing land investments when invasive plants are not addressed, and buyers can understand how to recognize major infestations that may require major control expenditures.

Work with invasive plant control contractors to develop methods for them to build their market presence with real estate professionals. Would contractors be willing to provide cost-effective inspections and quotes to potential land buyers in the same way that pest control operators provide termite treatment quotes for home purchasers?

As people who are concerned with invasive plants, we need to find methods to reach outside of our current professional circles to build new ways to address the problem. The one certainty about private land in our country is that it will transfer hands over time. Let's not ignore these opportunities to address invasive plant problems during the process.

*Matt Nespeca, Regional Sales and Technical Service Manager, Nufarm Americas,  
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# Small and Big Measures of Success — A Nice Surprise

by Chris Lockhart, photos by Sam Wright, Fairchild Tropical Botanic Garden

The white flowers of a small ground cover plant dotted the disturbed landscape, catching the eye of Florida Natural Areas Inventory (FNAI) biologist Chris Lockhart. During a routine invasive plant survey at John U. Lloyd Beach State Park (Lloyd SP), she discovered them spreading onto a bed of mulched Australian pine (*Casuarina equisetifolia*). Chris pointed it out to Park Service Specialist Carmelo Duesler and took a small sample to identify over lunch. What a lunch time treat! It was easily determined to be the federally endangered beach clustervine (*Jacquemontia reclinata*)!

The area of discovery was one of a few sites where this Category I invasive non-native plant has been removed from Lloyd SP over the past several years, along with Brazilian pepper (*Schinus terebinthifolius*), punk tree (*Melaleuca quinquenervia*), lather leaf (*Colubrina asiatica*), beach naupaka (*Scaevola taccada*) and mahoe (*Talipariti tiliaceum*).

In the 1970s, before Lloyd SP became a state park, numerous areas were overcome with the shade-providing but gangly Australian pines. Typical of an Australian pine infestation, few plants grew in the understory except other invasive plants such as air potato (*Dioscorea bulbifera*) and oyster plant (*Tradescantia spathacea*). This was likely due at least in part to compounds in the leaves of the pines that retard the germination and growth of seedlings (1, 2, 3) and a thick duff layer, allowing the trees to tower over their territory with little competition. The “she-oaks,” as they are called in Australia, are more closely related to oaks than pines, which accounts for their very hard, dense wood. Although great for shade, the sterile ground under these trees provides poor wildlife habitat; and along the beach, their gnarly roots can entangle sea turtles that come ashore to nest.

Restoration is a gradual process. After decades (or, in this case, roughly a century) of tree invasion, the basis of recovery is formed by removal, replanting and monitoring. Mangroves have since been planted along Lloyd SP’s entrance road, offering wildlife habitat, erosion control and a shaded drive. Native trees, shrubs and groundcover plants have gradually grown to fill in the gaps. And gaps there were, especially in areas where the Australian pine once formed dense stands.

The project to remove Australian pine and other invasive plants from Lloyd SP was completed in 2005. Mulch remained and various good and bad trees, shrubs and groundcover plants began to claim territory in the newly found sunlight. In the late 1980s or early 1990s, a sighting of the beach *Jacquemontia* was reported from Lloyd SP. Until now, its presence could not be substantiated. The recent find has stimulated new interest.



Flower close-up, *Jacquemontia reclinata*

Botanists Amy Jenkins (FNAI) and Sam Wright (Fairchild Tropical Botanic Garden) were hot on the trail. Sam visited Lloyd SP a couple of times, not only to confirm the rare find, but to document the extent of the population. What started as a small delight turned out to be one of the larger populations of beach *Jacquemontia* in Florida.

Sam described some reactions to the find. “There was an invasive removal crew at John U. Lloyd the day I went to survey the plants. I told them about the *Jacquemontia* appearing after the invasive plant removal. One crew member responded by saying ‘that makes me happy...That can keep me going for another three months.’ I think it would be great for these and other crews to know that their work really is improving conditions for rare plants. Native plants and habitats are more resilient than we give them credit for. With restoration projects we sometimes don’t have the patience (for whatever reason) to allow natural succession to revegetate an area. We feel the need to plant right away, but the seed bank is there and it’s just waiting to be released. Time and time again I have observed rare plants reappearing after invasive removal.”

The Florida Department of Environmental Protection, Division of Recreation and Parks has done (and continues to do) a terrific job on the removal of invasive non-native plants and subsequent restoration. There are currently over 130 species listed as invasive non-native plants by the Florida Exotic Pest Plant Council ([www.fleppc.org](http://www.fleppc.org)), and plenty of work remains. Restoration efforts give the native flora and fauna a new chance



for life. It's a struggle sometimes, with the pressure of urbanization and threats of climate change, but discoveries like this lift the spirits of scientists, nature lovers and work crews alike. There's hope for some of our rare species out there – one step at a time.

### Acknowledgements

The following people contributed to this article: Sam Wright, Fairchild Tropical Botanic Garden; Carmelo Duesler, John U. Lloyd Beach State Park, Florida Department of Environmental Protection, Division of Recreation and Parks; Amy Jenkins, Florida Natural Areas Inventory; Parks Small, Florida Department of Environmental Protection, Division of Recreation and Parks.

Chris Lockhart, Florida Natural Areas Inventory, [clockhart@fnai.org](mailto:clockhart@fnai.org)

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Orange flags mark individual Jacquemontia plants growing through Australian pine leaf litter and mulched invasive plants.

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# Invasive Exotic Pest Plants in Tennessee – 2009

Updated in December 2009 with the help of 21 field biologists and land managers and using listing criteria developed from a variety of existing protocols (TNC/NPS, MA, CA, CT, VI).

## Tennessee Exotic Pest Plant Council Criteria for Evaluating Plant Species for Invasiveness in Tennessee

Criteria that must be met for plants to fall into the following categories: Severe Threat, Significant Threat, Lesser Threat, Alert.

Invasiveness Category	Criteria that must be met for each invasive category
Base criteria	1-4
Severe threat	5 or 6
Significant threat	7 and 8 or 9
Lesser threat	10 and 11
Alert	12 or 13 or 14

### BASE CRITERIA:

- 1) The plant species, sub-species or variety is established outside of cultivation and is non-native to some portion of the region of North America within which it occurs.
- 2) The species has the potential for rapid growth, high seed or propagule production and dispersal, and establishment in natural communities of North America or in managed areas where it is not desired or the species persists in free living infestations (outside of cultivation) within Tennessee.
- 3) The species occurs in the state of Tennessee.
- 4) The species is known to out-compete other species in native plant communities within the state of Tennessee.

### SEVERE THREAT:

- 5) The species meets criteria 1-2 and is listed as a noxious weed in Tennessee or by the federal government, – OR – 6) The species meets criteria 1-4 and occurs in at least 30 counties (ca. 30% of Tennessee counties), presents substantial management difficulties (for example, *Lespedeza cuneata* at a high density and narrow distribution poses less of a threat to native populations and is easier to manage than *Lespedeza cuneata* at lower density dispersed over large areas and growing among off-target native species potentially affected by herbicide use, while *Microstegium vimineum* occurs in dense populations, creates substantial seed banks that are unmanageable over the short-term, and requires long-term efforts).

### SIGNIFICANT THREAT:

- 7) The species meets criteria 1-4 and meets either 8 or 9 below, – AND – 8) The species occurs within at least 30 counties in Tennessee and management does not present substantial difficulties, – OR – 9) The species occurs in 10 to 29 counties within Tennessee and presents substantial management difficulties.

### LESSER THREAT:

- 10) The species meets criteria 1 through 4, – AND – 11) The species occurs in 10 to 29 counties within Tennessee and does not present substantial management difficulties.

### ALERT:

- 12) The species meets criteria 1 through 2 and shows invasiveness in similar habitats to those found in Tennessee, – OR – 13) 1 through 3 and shows invasiveness in similar habitats to those found in Tennessee, – OR – 14) The species meets criteria 1-4, occurs in fewer than 10 counties, and is considered a severe threat in adjacent states or poses substantial management difficulties.



Chinese privet (*Ligustrum sinense*)

RON MCCONATHY

**Severe Threat:** Exotic plant species that possess characteristics of invasive species and spread easily into native plant communities and displace native vegetation.

Species ITIS Nomenclature	Common Name	Habit
<i>Ailanthus altissima</i> (P. Mill.) Swingle	tree of Heaven	tree
<i>Albizia julibrissin</i> Durazz.	mimosa	tree
<i>Alternanthera sessilis</i> (L.) R. Br. ex DC.	sessile joyweed	forb/herb
<i>Bromus tectorum</i> L.	cheat grass, downy brome	grass
<i>Celastrus orbiculatus</i> Thunb., <i>Celastrus orbiculata</i> Thunb.	Asian bittersweet	woody vine
<i>Dioscorea oppositifolia</i> L., <i>D. batatas</i> Dcne., <i>Dioscorea polystachya</i> Turcz.	Chinese yam	deciduous vine
<i>Elaeagnus umbellata</i> var. <i>parviflora</i> (Royle) Schneid.	autumn olive	shrub
<i>Hydrilla verticillata</i> (L.f.) Royle	Hydrilla, water thyme	aquatic
<i>Hypericum perforatum</i> L.	goatweed, St. John's-wort	shrub, subshrub
<i>Imperata cylindrica</i> (L.) Beauv. (all varieties and cultivars)	cogongrass, Japanese bloodgrass	grass
<i>Kummerowia stipulacea</i> (Maxim.) Makino, <i>Lespedeza stipulacea</i> Maxim.	Korean clover	forb
<i>Lespedeza bicolor</i> Turcz.	bicolor lespedeza, shrubby bushclover	shrub, subshrub
<i>Lespedeza cuneata</i> (Dum.-Cours.) G. Don	sericea lespedeza	forb
<i>Ligustrum sinense</i> Lour.	Chinese privet	shrub
<i>Ligustrum vulgare</i> L.	common privet	shrub
<i>Lonicera japonica</i> Thunb.	Japanese honeysuckle	vine
<i>Lythrum salicaria</i> L. [all varieties and cultivars]	purple loosestrife	wetland forb
<i>Microstegium vimineum</i> (Trin.) A. Camus, <i>Eulalia viminea</i> (Trin.) Kuntze	Nepalgrass, Japanese grass	grass
<i>Paulownia tomentosa</i> (Thunb.) Sieb. & Zucc. ex Steud.	princess tree	tree
<i>Polygonum cuspidatum</i> Seib. & Zucc., <i>Fallopia japonica</i> (Houttt.) Dcne.	Japanese knotweed, Mexican bamboo, fleecflower	subshrub
<i>Pueraria montana</i> var. <i>lobata</i> (Willd.) Maesen & S. Almeida, <i>Pueraria lobata</i> (Willd.) Ohwi	Kudzu	vine
<i>Rosa multiflora</i> Thunb. ex Murr.	multiflora rose	shrub
<i>Rottboellia cochinchinensis</i> (Lour.) W.D. Clayton	Itchgrass	grass
<i>Salvinia molesta</i> Mitchell	aquarium water-moss	aquatic
<i>Solanum viarum</i> Dunal	tropical soda apple	subshrub
<i>Sorghum halepense</i> (L.) Pers.	Johnson grass	grass

**Significant Threat:** Exotic plant species that possess characteristics of invasive species but are not presently considered as such in native plant communities as those species listed as **Rank 1**.

Species ITIS Nomenclature
<i>Alliaria petiolata</i> (Bieb.) Cavara & Grande, <i>Alliaria officinalis</i> Andr. ex Bieb
<i>Allium vineale</i> L.
<i>Alternanthera philoxeroides</i> (Mart.) Griseb., <i>Achyranthes philoxeroides</i> (Mart.) Standl.
<i>Arthraxon hispidus</i> (Thunb.) Makino, <i>Arthraxon hispidus</i> var. <i>cryptatherus</i> (Hack.) Honda
<i>Arundo donax</i> L., <i>Arundo donax</i> var. <i>versicolor</i> (P. Mill.) Stokes
<i>Berberis thunbergii</i> DC
<i>Broussonetia papyrifera</i> (L.) L'Her. ex Vent.
<i>Carduus nutans</i> L.
<i>Centaurea biebersteinii</i> DC, <i>Centaurea stoebe</i> L. ssp. <i>micranthos</i> (Gugler) Hayek
<i>Cirsium vulgare</i> (Savi) Ten., <i>Carduus vulgaris</i> Savi
<i>Elaeagnus pungens</i> Thunb.
<i>Eragrostis curvula</i> (Schrud.) Nees
<i>Glechoma hederacea</i> L.
<i>Iris pseudacorus</i> L.
<i>Lolium arundinaceum</i> (Schreb.) S.J. Darbyshire, <i>Festuca arundinacea</i> Schreb., <i>Schedonorus phoenix</i> (Scop.) Holub
<i>Lonicera maackii</i> (Rupr.) Herder.
<i>Lysimachia nummularia</i> L.
<i>Maclura pomifera</i> (Raf.) Schneid.
<i>Melia azedarach</i> L.
<i>Mentha x piperita</i> L.
<i>Miscanthus sinensis</i> Anderss., <i>Miscanthus sinensis</i> var. <i>gracillimus</i> A.S. Hitchc., <i>M. sinensis</i> var. <i>variegatus</i> Beal, <i>M. sinensis</i> var. <i>zebrinus</i> Beal
<i>Murdannia keisak</i> (Hassk.) Hand.-Maz., <i>Aneilema keisak</i> Hassk.
<i>Myriophyllum aquaticum</i> (Vell.) Verdc., <i>Myriophyllum brasiliense</i> Camb.
<i>Myriophyllum spicatum</i> L.
<i>Polygonum caespitosum</i> var. <i>longisetum</i> (deBruyn) A.N. Steward, <i>Persicaria longiseta</i> (de Bruyn) Moldenke
<i>Polygonum persicaria</i> L.
<i>Populus alba</i> L.
<i>Potamogeton crispus</i> L.
<i>Rorippa nasturtium-aquaticum</i> (L.) Hayek, <i>Nasturtium officinale</i> Ait. f.
<i>Setaria faberi</i> R.A.W. Herrm.
<i>Setaria italica</i> (L.) P. Beauv.
<i>Setaria viridis</i> (L.) P. Beauv.
<i>Spiraea japonica</i> L.f.
<i>Tussilago farfara</i> L.
<i>Verbascum thapsus</i> L.
<i>Vinca major</i> L.
<i>Vinca minor</i> L.



Japanese honeysuckle (*Lonicera japonica*)

CHUCK BARGERON, UNIVERSITY OF GEORGIA

possess characteristics of  
 ed to spread as easily into native plant  
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Common Name	Habit
garlic-mustard	forb
field Garlic	forb/herb
alligatorweed	forb/herb
hairy jointgrass	grass
giant reed, elephant grass	grass
Japanese barberry	shrub
paper mulberry	tree
musk thistle, nodding thistle	forb
spotted knapweed	forb/herb
bull thistle	forb
thorny-olive	shrub
weeping love grass	grass
gill-over-the-ground, ground ivy	deciduous vine
pale-yellow iris	wetland forb
tall fescue	grass
Amur bush honeysuckle	shrub
moneywort, creeping Jenny	forb/herb
Osage Orange	tree
Chinaberry	tree
peppermint	forb/herb
zebra grass, Chinese silver grass	grass
Asian spiderwort	forb/herb
parrot feather, Brazilian water-milfoil	aquatic
Eurasian water-milfoil	aquatic
bunchy knotweed, oriental ladythumb, bristly lady's-thumb	forb/herb
lady's thumb	forb/herb
white poplar	tree
curly pondweed	aquatic
watercress	aquatic
nodding foxtail-grass	grass
foxtail-millet	grass
green millet, giant green foxtail	grass
Japanese spiraea	shrub
coltsfoot	forb/herb
common mullein	forb/herb
Greater periwinkle	vine
common periwinkle	vine

**Lesser Threat:** Exotic plant species that spread in or near disturbed areas, and are not presently considered a threat to native plant communities.

Species ITIS Nomenclature	Common Name	Habit
<i>Bromus secalinus</i> L.	rye brome	grass
<i>Bromus sterilis</i> L.	poverty brome	grass
<i>Buglossoides arvensis</i> (L.) I.M. Johnston, <i>Lithospermum arvense</i> L.	corn gromwell	forb/herb
<i>Bupleurum rotundifolium</i> L.	hound's-ear, hare's-ear	forb/herb
<i>Cardiospermum halicacabum</i> L.	balloonvine, love-in-a-puff	deciduous vine
<i>Centaurea cyanus</i> L.	bachelor's button, cornflower	forb/herb
<i>Cichorium intybus</i> L.	chicory	forb
<i>Clematis terniflora</i> DC, <i>Clematis maximowicziana</i> Franch. & Savigny, <i>Clematis paniculata</i> Thunb.	leatherleaf clematis, sweet autumn clematis	vine
<i>Conium maculatum</i> L.	poison hemlock	forb
<i>Dipsacus fullonum</i> L.	Fuller's teasle, common teasle	forb/herb
<i>Egeria densa</i> Planch., <i>Elodea densa</i> (Planch) Casburg	Brazilian elodea, Brazilian water-weed	aquatic
<i>Euonymus alatus</i> (Thunb.) Siebold, <i>Euonymus alata</i> (Thunb.) Sieb.	burning bush	shrub
<i>Euonymus fortunei</i> (Turcz.) Hand.-Mazz., <i>Euonymus hederaceus</i> Champ. & Benth.	winter creeper	woody vine
<i>Hedera helix</i> L.	English ivy	woody vine
<i>Hibiscus syriacus</i> L.	Rose of Sharon	shrub, tree
<i>Mentha spicata</i> L.	spearmint	wetland forb
<i>Muscari neglectum</i> Guss. ex Ten., <i>Muscari atlanticum</i> Boiss. & Reut.	grape hyacinth	forb/herb
<i>Ornithogalum umbellatum</i> L.	Star of Bethlehem	forb/herb
<i>Pastinaca sativa</i> L.	wild parsnip	forb/herb
<i>Ranunculus bulbosus</i> L.	St. Anthony's turnip	forb/herb
<i>Rubus phoenicolasius</i> Maxim.	wineberry	subshrub
<i>Tragopogon dubius</i> Scop.	yellow goat's-beard	forb
<i>Wisteria floribunda</i> (Willd.) DC, <i>Rehsonia floribunda</i> (Willd.) Stritch	Japanese wisteria	vine



Greater periwinkle (*Vinca major*)

CHRIS EVANS, RIVER TO RIVER CWMA, COURTESY OF BUGWOOD.ORG

**Alert:** Exotic plant species that are known to be invasive in similar habitats to those found in Tennessee, are listed as a severe threat in adjacent states, or pose substantial management difficulties where they occur but for which more information is needed to determine their invasiveness in the state of Tennessee.



Beale's barberry (*Mahonia bealei*)



Chinese wisteria (*Wisteria sinensis*)

Species ITIS Nomenclature	Common Name	Habit
<i>Achyranthes japonica</i> var. <i>hachijoensis</i> Honda	Japanese chaff flower	forb
<i>Acroptilon repens</i> (L.) DC., <i>Centaurea repens</i> L.	Russian knapweed	forb/herb
<i>Agrostis stolonifera</i> L.	creeping bentgrass	grass
<i>Bromus japonicus</i> Thunb. ex Murr., <i>Bromus arvensis</i> L.	Japanese bromegrass	grass
<i>Buddleja davidii</i> Franch.	butterfly bush	shrub subshrub
<i>Carduus acanthoides</i> L.	plumeless thistle	forb/herb
<i>Cirsium arvense</i> (L.) Scop., <i>Carduus arvensis</i> (L.) Robson	Canada thistle	forb/herb
<i>Coronilla varia</i> L., <i>Securigera varia</i> (L.) Lassen	crown vetch	vine
<i>Daucus carota</i> L.	wild carrot, Queen Anne's-lace	forb
<i>Dioscorea bulbifera</i> L.	air-potato	deciduous vine
<i>Eichhornia crassipes</i> (Mart.) Solms	floating water hyacinth	aquatic
<i>Elaeagnus angustifolia</i> L.	Russian olive	tree
<i>Firmiana simplex</i> (L.) W. Wight	Chinese parasol tree	tree/shrub
<i>Gaillardia pulchella</i> Foug.	firewheel	forb
<i>Helianthus ciliaris</i> DC.	Texas blueweed	forb/herb
<i>Hesperis matronalis</i> L.	dame's rocket	forb/herb
<i>Ilex crenata</i> Thunb.	Japanese holly	shrub/small tree
<i>Koelreuteria paniculata</i> Laxm.	goldenrain tree	tree
<i>Kummerowia striata</i> (Thunb.) Schindl., <i>Lespedeza striata</i> (Thunb.) Hook. & Arn.	Japanese clover	forb/herb
<i>Lepidium campestre</i> (L.) Ait. F.	field pepperweed	forb/herb
<i>Leucanthemum vulgare</i> Lam., <i>Chrysanthemum leucanthemum</i> L., <i>Chrysanthemum vulgare</i> Lam.	ox-eye daisy	forb/herb
<i>Ligustrum japonicum</i> Thunb.	Japanese privet	shrub
<i>Ligustrum obtusifolium</i> Sieb. & Zucc.	border privet	shrub
<i>Lonicera fragrantissima</i> Lindl. & Paxton	January jasmine	shrub
<i>Lonicera morrowii</i> Gray	Morrow's bush honeysuckle	shrub
<i>Lonicera tatarica</i> L.	Tartarian honeysuckle, twinsisters	shrub
<i>Lonicera x bella</i> Zabel	Bell's bush honeysuckle	shrub
<i>Lotus corniculatus</i> L.	birdfoot trefoil	forb/herb
<i>Ludwigia uruguayensis</i> (Camb.) Hara, <i>Ludwigia grandiflora</i> (M. Micheli) Greuter & Burdet	Uruguay waterprimrose	forb/herb to subshrub
<i>Lygodium japonicum</i> (Thunb. ex Murr.) Sw.	Japanese climbing fern	forb/herb/vine
<i>Mahonia bealei</i> (Fortune) Carr., <i>Berberis bealei</i> Fortune	Oregon grape	shrub
<i>Melilotus alba</i> Medikus	white sweet clover	forb/herb
<i>Melilotus officinalis</i> (L.) Lam., <i>Melilotus albus</i> var. <i>annuus</i> Coe; <i>Melilotus albus</i> Medik.	yellow sweet clover	forb/herb
<i>Myosotis scorpioides</i> L.	true forget-me-not	forb/herb
<i>Najas minor</i> All.	water nymph	aquatic
<i>Nandina domestica</i> Thunb.	Nandina, sacred-bamboo	shrub
<i>Phalaris canariensis</i> L.	canary grass	grass
<i>Phragmites australis</i> (Cav.) Trin. ex Steud.	common reed	grass, aquatic
<i>Polygonum perfoliatum</i> L.	mile-a-minute	forb/herb
<i>Pyrus calleryana</i> Dcne.	Bradford pear, callery pear	tree
<i>Rubus bifrons</i> Vest ex Tratt	Himalayan berry	subshrub
<i>Salsola tragus</i> L., <i>S. kali</i> spp. <i>tragus</i> (L.) Celak.	prickly Russian thistle	forb
<i>Senna obtusifolia</i> (L.) H.S. Irwin & Barneby, <i>Cassia obtusifolia</i> L.	sicklepod senna	forb/herb
<i>Setaria pumila</i> (Poir.) Roem. & Schult.	yellow foxtail, smooth millet	grass
<i>Sonchus arvensis</i> L.	perennial sowthistle, sowthistle	forb/herb
<i>Trapa natans</i> L.	water chestnut	aquatic
<i>Triadica sebifera</i> (L.) Small, <i>Sapium sebiferum</i> (L.) Roxb., <i>Triadica sebiferum</i> (L.) Roxb.	Chinese tallowtree	tree
<i>Tribulus terrestris</i> L.	puncturevine	forb/herb
<i>Wisteria sinensis</i> (Sims) DC, <i>Rehsonia sinensis</i> (Sims) Stritch	Chinese wisteria	vine

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## FLEPPC'S KATHY CRADDOCK BURKS EDUCATION GRANT REQUEST FOR PROPOSALS – FY2010



The Florida Exotic Pest Plant Council is soliciting grant proposals for non-native invasive plant education and outreach projects in Florida. The intent of these grants is to provide funding to organizations or individuals who will educate Floridians about non-native invasive plants and their influences on the environment and economy of Florida. Proposals will be accepted from individuals, public or private nonprofit organizations, and academic institutions.

### Award preference will be given to proposals that meet the following criteria:

- Involve plants listed as Category-I species on the FLEPPC 2009 List of Invasive Plant Species, found on [www.fleppc.org](http://www.fleppc.org) (projects involving Category-II species will also be considered);
- Include an educational message that will reach a large segment of the community;
- Heighten community awareness about non-native invasive plant identification, management, prevention, environmental and/or economic impacts;
- Involve an active component (passive programs such as signs, brochures or websites should be enhanced to promote an event or an action involving the target audience);
- Include an evaluation of project success;
- Demonstrate matching funds or in-kind contributions;
- Include partnerships (please specify type and degree of involvement for partner entities);
- Include a detailed timeline of grant activities.
- First time applicants and new/startup projects will be given preference, although repeat applicants and established programs will be considered.

Application instructions and further information may be found on the FLEPPC website ([www.fleppc.org](http://www.fleppc.org)). Grants may not be used to fund food or beverages, capital expense items (sprayers, chain saws, machinery, herbicide), overhead costs (e.g., electricity) or large-scale herbicide application activities. Requests for funding should not exceed \$1,000.00 and all funds awarded are to be used within one year of receipt. If full funding is not available, partial funding may be awarded. Applicant/organization must present a summary of results at the FLEPPC annual meeting (poster or presentation) or provide a summary article for possible inclusion in Wildland Weeds magazine. The FLEPPC Education Grant Committee reserves the right to review all publications resulting from its funding (prior to printing or distribution) for accuracy.

### The deadline for proposal submission is 5pm on February 1, 2010.

The FLEPPC Education Committee will review all applications. Winners will be announced in April 2010 at FLEPPC's annual conference, held this year in Crystal River, FL.

### For further information, contact:

Jennifer Possley, [jpossley@fairchildgarden.org](mailto:jpossley@fairchildgarden.org)  
Ph: 305-667-1651, ext. 3433, Fax: 305-665-8032

## FLEPPC JULIA MORTON INVASIVE PLANT RESEARCH GRANT PROGRAM REQUEST FOR PROPOSALS • Deadline: February 26, 2010

### BASIC ELIGIBILITY REQUIREMENTS:

To be eligible for funding, applicants must be an undergraduate or graduate student enrolled at an accredited institution of higher learning anywhere within the United States. However, the research must be on a listed Florida invasive plant (<http://www.fleppc.org/list/list.htm>). An accompanying letter of recommendation from a faculty advisor is strongly encouraged.

The Florida Exotic Pest Plant Council (FLEPPC) has available funding for a small number of research grants/scholarships for students conducting studies related to invasive exotic plant management in Florida.

**The deadline for proposal submission is February 26, 2010.** Written proposals should be no more than three pages in length, include detailed methods for the research to be conducted, and should request funding for no more than \$2,500. The proposal should include a summary of the research project and its relationship with Florida exotic pest plant management problems. Particular plant species involved in the study should be one or more of the Category I or Category II exotic pest plant species listed by FLEPPC (see: [www.fleppc.org](http://www.fleppc.org)). In addition, the applicant should provide complete contact information and a detailed budget, with an explanation of how the funding will be used. Examples include (but are not limited to) travel funds for field work, funds for research equipment or supplies (or temporary use of specialized equipment), a stipend for applicant's project work time not otherwise supported, travel funds for presentation of the research at the annual FLEPPC meeting, etc. In developing the budget, funds requested are to be used for the direct costs of conducting research on the proposed project and are not to be used for indirect costs incurred by the student's university.

Proposals will be evaluated and ranked on the critical management need for scientific results in the area of study and on the clarity of the submitted request.

**Proposals are due by 5:00 p.m. 2/26/10. Send proposals by e-mail to: Dr. Betsy Von Holle, [vonholle@mail.ucf.edu](mailto:vonholle@mail.ucf.edu)**



# Kentucky Celebrates Invasive Plant Awareness Month

by Joyce Bender, KY EPPC President

Kentucky's Invasive Plant Awareness Month was kicked off with a presentation of Governor Steve Beshear's proclamation in the Capitol rotunda on August 24th. Representing the governor was Leah MacSwords, director of the Division of Forestry. Receiving the signed proclamation was Kay Fisher, current president of the Garden Club of Kentucky and Ann Fiel, past president and avid supporter of KY EPPC's efforts to bring invasive plants to the public's attention. The month-long awareness campaign was planned jointly between the Garden Club of Kentucky and the KY EPPC as a follow-up to 2007's Weed Awareness Week.

Events to raise public awareness were scheduled from Mammoth Cave National Park to the Daniel Boone National Forest and on state and private natural areas in between. The public was invited to participate in weed pulls, weed identification hikes and attend presentations on invasive species. The mayors of three cities, including the capitol city of Frankfort, declared September Invasive Plant Month as well. The month ended on a high note with the Capitol Grounds Makeover. In an unprecedented effort, several massive bush honeysuckle (*Lonicera maackii*) shrubs were removed from an area near the governor's entrance to the state capitol and replaced with native fringe trees (*Chionanthus virginicus*). The Kentucky Native Plant Society donated the shrubs and the effort was supported by the Frankfort Garden Club and the South Frankfort Neighborhood Association. Removal of the honeysuckle and site preparation was provided by the staff from the Finance Cabinet's Department for Facilities and Support Services. The work crew was so enthusiastic that they also removed a nearby burning bush and the privet hiding behind it. The Department's Deputy Commissioner, Jerry Graves even stepped in to help plant the first fringe tree.

Alan Nations, the president of the Kentucky Native Plant Society presented a pen and pencil set made from bush honeysuckle wood to Steve Meredith, an official from the Finance Cabinet and asked that it be presented to the governor to thank him for declaring the month for invasive plant awareness. Nations explained his organization's donation of the fringe trees saying, "Our organization wanted to support Invasive Plant Awareness Month in a way that will last beyond September. Kentucky has so many native plants that work well in landscapes, what better place to start than planting on the Capitol grounds to remind everyone that they can have beauty and benefit our environment at the same time. Urban



Barbara Hadley-Smith, Jerry Graves, Joyce Bender and Alan Nations begin the Capitol Grounds makeover by planting a fringe tree where a bush honeysuckle was removed.

efforts such as this are instrumental in stopping the spread of invasive plants to Kentucky's diverse and beautiful natural areas."

Peggy Dungan, local member of the Frankfort Garden Club has been trying for many years to get the non-native plants that are taking over Frankfort's landscapes and the natural areas of Franklin County on people's radar. "The Capitol grounds were my playground as a child. They have been my front yard all my life. I feel very strongly about preserving their beauty for all Kentuckians to enjoy and to be a source of pride. I also feel very strongly that these grounds should set the example for all gardeners in Kentucky by utilizing native plants and removing invasives. I am very happy to know that finally we have the attention of the folks looking after the Capitol. I hope we can continue to remove the plants up there that are overwhelming our beautiful native flora and making it hard on the wildlife to find food."

Steve Meredith indicated that the Finance Cabinet would be willing to work with KY EPPC, the Garden Club of Kentucky and other interested citizens to continue removing invasives and replacing them with native plants. He asked for an inventory of the invasives on the Capitol grounds and a location map. Joyce Bender said that KY EPPC would work with local master gardeners and members of the Kentucky Native Plant Society to provide the inventory and map. She also said that there will be interpretive material developed to keep visitors and legislators apprised of the project as it proceeds.

Joyce Bender, Nature Preserves and Natural Areas Branch Manager, Kentucky State Nature Preserves Commission, Frankfort, KY Tel: (502) 573-2886, [www.naturepreserves.ky.gov](http://www.naturepreserves.ky.gov), [Joyce.Bender@ky.gov](mailto:Joyce.Bender@ky.gov)



## **Disturbance and Change, Invasive Plants and Paths to Recovery**

*a Joint Meeting of SE-EPPC and SE-SERI*

Chattanooga, TN, May 11-13, 2010 (Tuesday-Thursday)

Join us May 11<sup>th</sup> through 13<sup>th</sup> for the first joint meeting between the Southeast Exotic Pest Plant Council and the Southeast Chapter of the Society for Ecological Restoration International. This will be an exciting meeting that brings together practitioners and researchers from the fields of restoration and invasive plant species management. Take this unique opportunity to network and learn together. The meeting will be held at the historic Sheraton Read House Hotel in the heart of downtown Chattanooga, Tennessee.

Chattanooga is a thriving city surrounded by spectacular views and offering an abundance of educational, recreational, and historical tourism opportunities including the outstanding Tennessee Aquarium. A variety of outdoor recreational opportunities are available within a very short drive of the downtown area including hiking, whitewater rafting, and much, much more. Chattanooga is a progressive city that has been addressing invasive plant issues and climate change and is creating a healthy, prosperous city for all generations as a green community.

### **KEYNOTE SPEAKER**

*Coping with Disturbance and Change: Identifying the Costs Associated with Invasive Plants in the Southeast*  
Don Hodges, University of Tennessee, Professor of Forest Economics and Policy and  
Director of the University of Tennessee Natural Resource Policy Center

### **PLENARY SPEAKERS**

*Insights into the Green Initiatives Being Made Within the City of Chattanooga*  
Gene Hyde, City Forester for Chattanooga, current Chair of the Chattanooga Green  
Committee, and lead member of Mayor Littlefield's climate protection core group.

*Restoration of Native Grasses in the southeastern United States*  
Tom Barnes, University of Kentucky, Professor and extension wildlife specialist

**For more information about the meeting and instructions on abstract submittal,  
go to the meeting web site at <http://www.se-eppc.org/2010/>**

**Florida Exotic Pest Plant Council  
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# **Changes in Latitude**



**April 5-8, 2010, Crystal River, Florida**

**For more information go to <http://www.fleppc.org/index.cfm>**

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- 2008 Banff, Alberta, CANADA
- 2010 Shepherdstown, West Virginia, USA

## MARK YOUR CALENDARS: Weeds Across Borders 2010 conference | June 1-4, 2010 National Conservation Training Center | Shepherdstown, West Virginia, USA

The Weeds Across Borders 2010 Coordinating Committee is now accepting abstracts for oral (paper) and poster presentations. The theme of this year's conference is "Plant Invasions: Policies, Politics, and Practices." Program session topics include: Cooperation & Partnerships, Applied Research Reports, New Issues, Border Management & Recreational Pathways, Economic & Ecological Impacts: Trends & Predictions, Awareness & Education, and Early Detection & Rapid Response.

For more information on the Call for Papers and a tentative Conference Agenda, visit the WAB 2010 website [visit www.weedcenter.org/wab2010](http://www.weedcenter.org/wab2010)

## Meet a couple of IPC's Valuable Employees



**Paul Rischmiller** started with IPC in October of 2008 jumping right into Florida's most invasive weeds as a crew leader. In 2009 Paul became a full time crew leader with responsibilities including management of the Hoosier National Forest project in southern Indiana. Paul is a graduate of St. Olaf College in Northfield, MN where he was the captain of the football team while concentrating on environmental studies. Paul garnered an early appreciation for the environment as an Eagle Scout. Thanks for your hard work, Paul. We look forward to many years working with you.

**Spencer Johnson** recently completed his first year with IPC. Spencer is a graduate of Florida Tech in Melbourne, FL with a degree in Marine Biology. Spencer's positive attitude is a big asset to the crew when summer temperatures reach the upper 90's or when winter temperatures dip below freezing. Spencer has been a crew leader for projects including GE Power, Montpelier Station and Naval Air Station Patuxent River. Spencer has also worked on invasive plant management projects including Fort Detrick in Frederick, MD and spent substantial time controlling invasives for the Fairfax County Park system in Virginia and says that he thanks God for the opportunity to help protect our environment. Thank you, Spencer, for a job well done.



# THANK YOU

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# “Meeting the Challenges of Invasive Non-native Plants” at the GA-EPPC 2009 Annual Meeting

by Brian Arnold

The Georgia Exotic Pest Plant Council (GA-EPPC) held its 2009 Annual Meeting at the State Botanical Garden of Georgia in Athens on November 5th. A diversity of professionals from four southeastern states attended “Meeting the Challenges of Invasive Non-native Plants.” Cynthia Taylor, Natural Resource Manager for Elachee Nature Science Center, and newly-elected GA-EPPC president, welcomed attendees and introduced speakers.

**Dr. James H. Miller**, Research Ecologist with the U.S. Forest Service, Southern Research Station, and Affiliate Professor of Forestry with Auburn University’s School of Forestry and Wildlife Sciences, was the keynote speaker. In his presentation, “Heroic Group and Individual Efforts are Finally Making a Difference,” Dr. Miller recognized the many efforts of GA-EPPC members and their volunteer teams who have conducted projects aimed at controlling non-native invasive species. He praised the collective efforts of GA-EPPC in formulating one of the most complete invasive plant lists in the region, and the many invaluable websites from the University of Georgia’s Center for Invasive Species and Ecosystem Health. He commended the formation of the four state cogongrass and invasive species task forces, and announced the newly posted regional maps and spreadsheets showing occupation of 33 high threat invasive taxa at [www.invasive.org/fiamaps/](http://www.invasive.org/fiamaps/). He stressed EPPC’s role in informing “those in power” of the biosecurity threat posed by invasive species. In comments that led to lively discussion, Dr. Miller challenged attendees to consider the emerging understanding regarding the liabilities of prescribed burning in opening forest stands to invasions by invasive species. He stressed that good judgment must be used with prescribed burning, weighing the positive benefits with these liabilities when invasives occur nearby. Dr. Miller also mentioned the pending revision of his popular “Nonnative Invasive Plants of Southern Forests.” An expanded two-volume set should be available for distribution by early summer.

**James Johnson**, Forest Health Coordinator for the Georgia Forestry Commission, discussed federal stimulus funding of invasive species control efforts. Mr. Johnson’s presentation, “Georgia’s Invasive Species Incentive Program – Economic Stimulus Funding,” outlined the process



of awarding \$1,795,000 in stimulus funds. Mr. Johnson explained that although the funds are designated for invasive species control, the primary purpose is job creation. Although Georgia State Park and Historic Sites and the Warnell School lands managed by the University of Georgia have funds earmarked for invasive species surveying, control and marketing of a consistent invasive species message, the majority of the funds will go to private land owners, with “limited resource” landowners receiving priority. Although the application period has expired, more details about the program are available at [www.gatrees.org](http://www.gatrees.org).

**Newt Hardie**, leader of the Kudzu Coalition, presented “Using Farm Equipment to Kill Kudzu.” The Kudzu Coalition, a Spartanburg, SC non-profit organization, has gained much recognition for its innovation in controlling kudzu and other invasive species. The Coalition consists of a volunteer work force that operates without grants of any kind. The Coalition uses no herbicides but does work together with owners using chemical treatments – usually by removing any surviving kudzu plants. Mr. Hardie provided an entertaining presentation in which he demonstrated how his organization uses modified farm equipment and skid steer (Bobcat) tractors to battle kudzu. Several of the innovations were engineered by Coalition volunteers. Participants were treated to images of “Kudzilla,” a skid steer tractor growing in fame and being used in various applications. In order to learn more about the Coalition’s work, visit [www.kokudzu.com](http://www.kokudzu.com) and check out Kudzu Kollege. In a second presentation entitled “Engaging Volunteers in the Fight Against Invasives,” Mr. Hardie described experiences and lessons learned in finding, recruiting, and retaining volunteers.

**Steve Sanchez**, Landscape Architect with Hughes, Good, O’Leary and Ryan, addressed attendees in a presentation entitled “Non-native Invasive Species and the Challenge of Landscape Design.” Mr. Sanchez is recognized for his use of native plant material and his concern for invasive plant issues. He shared the challenge of creating a functional and aesthetic landscape without the use of invasive exotic plants. Mr. Sanchez explained the

difficulty in finding native plants that satisfy the needs of landscape clientele, which leads to the use of exotic species. The role of the Green Industry and the lack of knowledge by many landscape architects regarding native and/or invasive plant material were discussed.

**Chuck Bargeron**, Information Technology Director with the University of Georgia Center for Invasive Species and Ecosystem Health, presented “Georgia Invasives – Implementing Volunteer Mapping Using EDDMapS.” EDDMapS, the Early Detection & Distribution Mapping System, is used to record and map the locations of invasive species. It cooperates with and aggregates data from other invasive species mapping projects, and provides an important tool for management. For example, it is used in Early Detection & Rapid Response (EDRR) ef-

forts to prevent establishment of invasive plants into new areas, and to justify the need for management and resources. Mr. Bargeron explained the simple process by which an individual can register as a user and in so doing, take advantage of benefits such as receiving an email alert in the event that a given invasive is reported within a designated territory. Users can assist the system by reporting an invasive found in an area where it has not yet been recorded. Attendees were informed of enhancements that are planned for EDDMapS, including online training courses that will qualify for Continuing Education Credits. EDDMapS can be found on the UGA Center’s website at [www.invasive.org](http://www.invasive.org).

**Danielle Greene**, GA-EPPC board member and Curator of Horticulture and Environmental Initiatives at Zoo Atlanta, led

a panel discussion addressing the topic of working with volunteers. Panelists, including Ms. Taylor and Mr. Hardie, as well as Ayanna Williams of Park Pride, Blake Watkins of Trees Atlanta, and Dave Butler of Dekalb County Parks Department, offered attendees their advice by sharing stories of successes as well as failures.

The GA-EPPC business meeting included the election of officers:

**President:**

Cynthia Taylor, Natural Resource Manager, Elachee Nature Science Center

**President Elect:**

Mincy Moffett, Georgia DNR Nongame Conservation Section

**Secretary:**

Brian Arnold, Natures Landscape Services, Inc.

**Treasurer:**

Elaine Nash, Georgia Native Plant Society

Presentations from the annual meeting can be viewed at: <http://www.gaepcc.org/2009presentations.cfm>

Other GA-EPPC activities can be found at [www.gaepcc.org](http://www.gaepcc.org).

*Brian Arnold, Natures Landscape Services, Inc., [brian@natureslandscapeservices.com](mailto:brian@natureslandscapeservices.com)*

**Visit these award-winning examples of volunteers in action against invasive plant species:**

**Beachvitex.org** is home to the Beach Vitex Task Force that is committed to controlling the spread of the invasive plant, *Vitex rotundifolia* in North and South Carolina. This site provides facts about beach vitex and serves as an information clearinghouse.

**[www.kokudzu.com](http://www.kokudzu.com)** is home to the Kudzu Coalition and serves a diverse group of volunteers exploring new ways to control kudzu in South Carolina. Sign up for Kudzu Kollege!



# Internodes

## Mark Your Calendar

- **Changes in Latitude – 25th Annual Symposium of the Florida Exotic Pest Plant Council**, Crystal River, FL. April 5-8, 2010. Keynote speaker: Dr. Jeffrey Dukes, Purdue University. CEUs will be available. [www.fleppc.org](http://www.fleppc.org)
- **2010 Alabama Invasive Plant Council** meeting, Auburn University, AL. April 21, 2010. [www.se-eppc.org/alabama/](http://www.se-eppc.org/alabama/). CFE, Pesticide License, and other recertification points will be available.
- **2010 Aquatic Weed Control Short Course**, Coral Springs, FL. May 3-6, 2010. The short course is designed to benefit those new to the industry and experienced professionals seeking a comprehensive update. Topics include General Standards (CORE) Training, Pesticide Application Equipment Calibration Training, Plant Identification, Aquatic Pest Control Category Training, Natural Areas Weed Management Training, Right-of-Way Weed Management Training. Up to 20 Florida Continuing Education Units (CEUs) may be earned by attending this course. [www.conference.ifas.ufl.edu/aw](http://www.conference.ifas.ufl.edu/aw)
- **Disturbance and Change, Invasive Plants and Paths to Recovery - A Joint Meeting of the Southeast Exotic Pest Plant Council and Southeast Society for Ecological Restoration**, Chattanooga, Tennessee. May 11-13, 2010. Call for Papers and additional information will be available at [www.se-eppc.org](http://www.se-eppc.org)
- **Weeds Across Borders 2010**, Shepherdstown, West Virginia. June 1-4, 2010. A biennial conference gathering people from Canada, the U.S., and Mexico to focus on "Plant Invasions, Policies, and Politics." <http://www.fs.fed.us/ficmnew/wab10.shtml>
- **50th Annual Meeting of the Aquatic Plant Management Society (APMS)**, Bonita Springs, FL. July 11-14- 2010. [www.apms.org](http://www.apms.org)

## Websites

Visit the SE-EPPC website, [www.se-eppc.org](http://www.se-eppc.org), for current news on invasive species via the Bugwood Blog. In addition to Invasive Plants in the News, the website regularly announces recent publications, upcoming meetings and other resources, hosts the Southeast EPPC listserv and links to all state chapters under the Southeast umbrella. Issues of *Wildland Weeds* are posted and back issues may be searched by issue, author, or plant species at <http://www.se-eppc.org/wildlandweeds/>

Dr. James H. Miller, Research Ecologist with the USDA Forest Service, Southern Research Station reports the availability of updated maps for the 33 taxa shown in *Nonnative Invasive Plants of Southern Forests: A Field Guide for Identification and Control* using data up to May 2009. The maps may be viewed at [http://srsfia2.fs.fed.us/data\\_center/data\\_mapping.shtml](http://srsfia2.fs.fed.us/data_center/data_mapping.shtml) Annual updates are planned. Dr. Miller states, "The unique displays of areas of forest occupied by these destructive invasive species can be used to plan control/containment/eradication programs, convey the serious[ness] of these threats, and to educate ourselves, policy makers, and citizens."

## Publications

*Effects of hydrology on the growth and physiology of an invasive exotic, Lygodium microphyllum (Old World climbing fern)*, by S. Gandiaga, J. C. Volin, E. L. Kruger, & K. Kitajima. *Weed Research* (2009) 49:283–290

*Does release from natural belowground enemies help explain the invasiveness of Lygodium microphyllum? A cross-continental comparison*, by J. C. Volin, E. L. Kruger, V. C. Volin, M. F. Tobin, K. Kitajima. *Plant Ecology* (Published Online 21 November 2009).

*Inspection and cleaning manual for equipment and vehicles to prevent the spread of invasive species*, by Bureau of Reclamation, Policy and Program Services Office, Denver, and U.S. Army Corps of Engineers, Engineer Research and Development Center, Vicksburg. Technical Memorandum No. 86-68220-07-05 (Sept 2009).

*Species richness of both native and invasive aquatic plants influenced by environmental conditions and human activity*, by R.S. Capers, R. Selsky, G.J. Bugbee, J.C. White. *Botany* (2009) 87:306-314.

*Jatropha bio-diesel production and use*, by W.M.J. Achten, L. Verchot, Y.J. Franken, et al. *Biomass and Bioenergy* (2008) 32(12):1063-1084. "In this paper, we give an overview of the currently available information on the different process steps of the production process of bio-diesel from JCL [*Jatropha curcas* L.], being cultivation and production of seeds, extraction of the oil, conversion to and the use of the bio-diesel and the by-products... The review concludes with a call for general precaution and for science to be applied."

*The worldwide airline network and the dispersal of exotic species: 2007-2010*, by A.J. Tatem. *Ecography* (2009) 32(1):94-102. "International air travel has played a significant role in driving recent increases in the rates of biological invasion and spread of infectious diseases."

*Weedy and invasive plant genomics*, by C.N. Stewart. 2009. 253 pp. ISBN 978-0-8138-

2288-4. Wiley-Blackwell, Ames, Iowa. [www.wiley.com](http://www.wiley.com). The author believes that more collaborative research will soon take place as the research communities and cultures of weed science and of plant genomics and evolutionary biology converge on the field of weed genomics.

## Legislative Notes

The US Army Corps of Engineers published a memorandum, *Guidance on Authorities for Project Specific Restrictions to Manage the Introduction of Invasive Species*, on December 17, 2009. "In executing the U.S. Army Corps of Engineers mission to provide public outdoor recreation opportunities and protect natural resources, Corps projects are faced with escalating problems concerning the introduction of invasive species .... The purpose of this memorandum is to establish guidance that can be applied in a consistent manner, nationwide, to manage the introduction of invasive species on Corps projects." This guidance includes enforcement suggestions which include asking the U.S. Attorney's office to seek restitution of damages, in addition to fines, in particularly egregious cases of invasive species introductions. View this encouraging document at <http://corpslakes.usace.army.mil/employees/cecwon/pdfs/09dec17-INVSPEC.pdf>.

Doug Johnson, Executive Director of the California Invasive Plant Council ([www.cal-ipc.org](http://www.cal-ipc.org)), compiled statistics on the number of comments submitted to [www.regulations.gov](http://www.regulations.gov) on the USDA-APHIS Q-37 rule changes creating the NAPPRA category and strengthening screening of plant imports. Of some 300 comments, close to 90% were supportive of the proposed rule changes and came from numerous organizations (public and private, at scales ranging from local to national) as well as individuals, including university researchers, professional biologists, and concerned citizens. Even nursery trade associations were cautiously supportive. The only organizations he found voicing opposition to the changes were the American Bamboo Society and Ball Horticultural Company. The only states in which opposing comments outweighed supporting were Texas and Louisiana.

A U.S. Senate Committee on Environment and Public Works, Subcommittee on Water and Wildlife, held a legislative hearing on December 3<sup>rd</sup> to review pending bills on invasive species from constrictor snakes to nutria to Asian carp to feral swine. The entire hearing, including written statements from witnesses, can be viewed at: [http://epw.senate.gov/public/index.cfm?FuseAction=Hearings.Hearing&Hearing\\_ID=45f45e40-802a-23ad-4565-d987acc7d6e7](http://epw.senate.gov/public/index.cfm?FuseAction=Hearings.Hearing&Hearing_ID=45f45e40-802a-23ad-4565-d987acc7d6e7)



Invasive Plant Control was established in 1997 with the sole purpose of controlling invasive species in natural areas.

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