

# Wildland Weeds

WINTER 2005



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# Wildland Weeds

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

An **exotic plant** has been introduced to Florida, either purposefully or accidentally, from a natural range outside of Florida. 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 Florida plant communities.

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**On the Cover:** A tracked skid steer with a feller buncher and a herbicide spray tank fells, bunches and sprays Australian pines trees (*Casuarina equisetifolia*). For more monster machines, see pp. 12-13.  
*Photo by Laurel Egan.*

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# The History of Tung Oil

by Karen Brown and William Keeler

While greatly enjoying the experience of studying local flora some years ago with the humorous yet venerable botanist, Dr. Dana Griffin of the University of Florida (now retired and birdwatching), I struggled to learn to identify the trees of Gainesville. One of my favorites was the tung oil tree, *Aleurites fordii*, because of its dead giveaway clue, the two tiny glands at the top of each leaf where it joins the petiole. This was as good as an answer written in the palm of one's hand during a final exam. I later learned that tung oil trees were an invasive exotic tree listed as a FLEPPC Category II species.\* Even later, I was surprised to learn there was a rich history of tung oil trees right here in my own backyard of Gainesville.



1946. Florida State Library and Archives, The Florida Memory Project.



1932. University Archives, Department of Special and Area Studies Collections, George A. Smathers Libraries, University of Florida.

“Florida now has one of the most important opportunities which ever came South for a visit, knocking at her door.”

(Dacy, 1927)

## History of American tung oil production

After extensive stands of pine trees were cut for timber in the early 1900s, Gulf Coast farmers looked for a suitable cash crop for the large acreage left over. The U.S. was the primary market for Chinese tung oil, importing 12 million gallons (100 million pounds) in 1927, and almost 120 million pounds in 1933, with demand still exceeding supply. Tung oil from southern China was extracted by hand from trees growing wild throughout

the country; they were not cultivated. Due to the fluctuations in cost, quality, and delivery, China was a risky source of the high-grade tung oil that was far superior to any other type of oil.

The first tung tree seed reportedly was brought to America from Hankow, China in 1905 by Dr. David Fairchild, then senior agricultural explorer for the U.S. Department of Agriculture (USDA). Resultant seedlings were distributed to experiment stations in the South. In 1912 the Bureau of Plant Industry issued a special bulletin, carrying the personal approval of Secretary of Agriculture James Wilson, which urged growers to plant tung orchards and offered a limited number of free one-year old trees. In the same year, ten trees were planted at UF's Agricultural Experiment Station in Gainesville. By

1927, there were some 400 growers and more than 10,000 acres of tung oil trees in Alachua and adjoining counties alone.

In 1928, L.P. Moore (nephew of the Benjamin Moore Paints founder) of the Alachua Tung Oil Corporation in Gainesville built the first mechanized tung oil compressing mill in the world. This began the commercial production of tung oil in the U.S. The largest of Florida's tung plantations at the end of 1937 was that of H.W. Bennett in Alachua County. Mr. Bennett studied tung trees in their native China along the Yangtze River. He returned to plant 100,000 trees on 2,000 acres from 1930-1932, establishing China Tung Oil on “Tung Acres” just outside of Gainesville.

In 1938, the USDA began an extensive research program on tung production at

\*Category II - Invasive exotics that have increased in abundance or frequency but have not yet altered Florida plant communities to the extent shown by Category I species.

laboratories in Georgia, Florida, Alabama, Louisiana and Mississippi. In 1941, just prior to the outbreak of WWII, tung oil was declared a strategic item for defense use. All tung oil produced was to be used for war efforts only. All ammunition was "coated, and all ships were painted by products using tung oil." Federal financial support programs were available, and the U.S. also helped planters in South America, particularly Argentina. Since there was an embargo on Chinese tung oil at this time, the domestic oil was profitable. The Pan American Tung Research and Development League was formed between tung oil producers in America and Argentina to work jointly on research and development and to pool tung oil from both countries to provide consistent supplies to U.S. consumers.

### Tung oil as a crop

Tung oil trees thrive in moist, well-drained, slightly acid soil (Dacy). Trees begin to bear fruit in their third year and yield commercial quantities at four to five years of age. Maximum production occurs in the tenth to twelfth years of growth. Trees were expected to be commercially productive for at least 20 years after maximum production occurred.

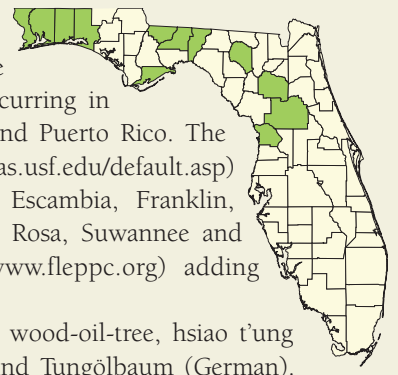
Fruits fall to the ground from late September through November and are left for a few weeks to dry and cure. Nuts are separated from the hard outer shell, and pressed to extract the oil. Byproducts can be used for mulch or burned for fuel but cannot be used as feed for livestock due to the fruit's toxic properties. Dried and pressed nuts yield about twenty percent oil. Under favorable conditions, an acre of tung trees will produce about two tons of nuts and eight hundred pounds (one hundred gallons) of raw tung oil annually. Late spring cold spells will kill spring growth and destroy the fruit for that year. However, the trees need from 200 to 400 hours below 45 degrees F for their dormancy period. (Moore/Davis) (Montgomery).

### The demise of American tung oil production

Between 1934 and 1940, frost almost totally ruined the tung nut crop for four

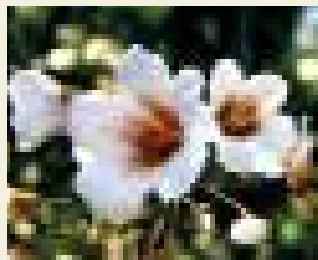
### Botanical Description and Distribution

*Aleurites fordii* (Hemsl.) is in the Euphorbiaceae (Spurge) family. The USDA Plants Database (<http://plants.usda.gov/>) shows the tung oil tree occurring in Florida, Georgia, Alabama, Mississippi, Louisiana, and Puerto Rico. The Atlas of Florida Vascular Plants (<http://www.plantatlas.usf.edu/default.asp>) lists vouchered specimens from Alachua, Citrus, Escambia, Franklin, Gadsden, Jefferson, Leon, Marion, Okaloosa, Santa Rosa, Suwannee and Walton counties, with the FLEPPC database ([www.fleppc.org](http://www.fleppc.org)) adding Columbia County.

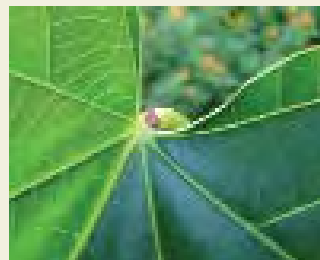


Common names include tung oil tree, Chinese wood-oil-tree, hsiao t'ung shu, t'ung shu, t'ung yu, tung yan shu (Chinese), and Tungölbaum (German). "Tung" is the Chinese word for "heart" and refers to the heart-shaped leaves of the tung tree, which is native to southern China and Indo-China.

The tung oil tree is a small deciduous tree up to 40 or more feet in height with smooth bark and a much-branched head. Branches are horizontal to semi-erect, often produced approximately in whorls. Leaves are glossy, dark green, alternate, long petioled and simple. Leaf blades are broadly ovate, 3-13 inches wide, entire with a cordate base and sharp point or with 2-5 sharp-pointed lobes. Two convex reddish-brown glands occur near the junction between the petiole and the leaf blade. The trees are monoecious (separate male and female flowers are borne on the same tree.) Flower petals are white tinged with red and yellow, darker at the base with dark red-branched lines running lengthwise. A prominent tuft of hairs occurs at the base of each petal. Flowers range from just over 1" to almost 3" in diameter. Petals range in number from 4-9. Fruits are 1-3" in diameter, dark green, turning brown upon maturity. Most are oblong to ovoid, but some are nearly spherical. Some have distinct longitudinal ridges. Fruit contains 3-7 large seeds, with 5 seeds being most common, ranging in size from 5/8" to 1-1/4" long with a brown coat and white flesh (Dickey, 1952).



FRED NATION



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different years. The industry had expanded from Florida, Georgia, and Alabama, to Mississippi, Louisiana, and Texas, with Mississippi the largest producing state. Although price supports continued, Argentina could sell oil at lower prices and U.S. producers were operating at a loss. In addition, frosts were decreasing the extent and yields of tung oil groves. In the 1950s and 1960s, freezes wiped out commercial tung activities in parts of Louisiana, Mississippi, and Alabama and all of Georgia. Hurricanes Betsy (1965) and Camille (1969) dealt the final blows to the tung plantations in southern Mississippi and eastern Louisiana. Camille destroyed or damaged about half of the groves in the

U.S., and destroyed the entire tung nut crop plus two thirds of the trees in Mississippi. Approximately 40,000 acres of groves were destroyed in one Mississippi county alone. Growers eligible for federal disaster compensation took it and went into other agricultural production. Unfortunately for the tung oil industry, Camille "came on the heels of what many thought would be the savior of the industry: a genetic breakthrough that produced late-blooming varieties capable of escaping late spring freezes." (Fry) It also was believed the new clones would maintain typical production but on only half the acreage. However, there was little incentive for replanting. Oil is the lone economically

## Poisonous properties:

### “Poisonous soup sickens over 100 students in Hunan”

A news report from central China's Hunan Province told of thirteen students who brought tung oil to school and put it into the breakfast soup to protest the school's food quality and price. Over 100 students were poisoned, with more than 40 sick enough to be hospitalized ([www.chinaview.cn](http://www.chinaview.cn)). Both the leaves and seeds of the tung tree are toxic if eaten, especially the seeds. In humans, a single tung nut can cause severe vomiting, diarrhea, cyanosis, respiratory depression, weakness, and possibly death (Everist, 1981). Effects are gastroenteritis, nausea, vomiting, abdominal cramps, diarrhea, dizziness, weakness, poor reflexes and dehydration. Onset of symptoms occurs in 30 minutes with recovery usually within 24 hours. Contact also can cause dermatitis. Two other cases of accidental poisoning occurred in November 1992 and November 1994 when elementary and high school students in Taiwan ate tung nuts, mistaking them for chestnuts. The students were hospitalized and symptoms subsided within one to two days (Lin, et al, 1996).

## Uses of tung oil

The tung tree was once the principle commercial source of tung oil, used as a high-grade, quick drying oil in paint, varnish, linoleum and printer's ink (Dickey, 1952).

The Chinese have used tung oil for waterproofing masonry, cloth, shoes, clothing, and paper. The oil, mixed with lime mortar or burned tung nut residue, was one of the world's first agents for waterproofing and caulking boats. When a 600 year old shipyard was excavated recently in Nanjing, China, caches of tung oil were found. Tung nut residue also was used in the manufacture of lampblack and Chinese ink, otherwise known as “India ink” (Federal Writers' Project). One unreferenced article states that tung oil is highly regarded as a medicine in China, used as a remedy for insanity and in the treatment of burns, bruises, and swellings. Tung oil reportedly was mixed in the mortar that made the Great Wall of China, and Marco Polo is said to have brought a sample back to the western world from China. *The Book of Poetry*, Chinese folk songs compiled by Confucius, mentions that the oil was used in Chinese lacquers.



1949. B.L. Kerce. Florida State Library and Archives, The Florida Memory Project.

significant product of tung trees; it can not be grown for fiber, meal, or fertilizer as with soybeans and flax. The climatic hazards, increasing production costs, competition from substitute synthetic products (domestic consumption declined almost 50% between 1955 and 1970), and more productive uses of land spelled the end for commercial tung oil production in the U.S. Tung orchards were abandoned or bulldozed and used for other crops, pasture or timber. Today, the major growing areas of tung trees include China, Argentina, Paraguay, and parts of Africa. The only domestic activity on tung oil is research to molecularly deconstruct its oil producing enzymes in order to convert low-cost vegetable oils to value-added drying oils. (USDA-ARS)

### Spread in Natural Areas

Although tung oil can be locally abundant, it is not seen as a major player in control projects to date (Leslie, pers. comm.). However, an estimated 84 acres

have been controlled since 1998 by the Florida Department of Environmental Protection's Bureau of Invasive Plant Management. Basal bark treatments of 15-20% Garlon 4 in oil work well, according to Drew Leslie of the Bureau. This is fortunate due to the lack of

natural enemies that exist.

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“The tree has no enemies that we have been able to discover that in any way affect it, either fungus or insect, nor have we been able to find that there is anything in China that affects the tree.”

(Williamson, 1927)

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## Conclusion

It seems a sad story that a commercial crop that was so intensely researched, promoted and invested in was wiped out by the ravages of nature and the development of synthetic substitutes and products of lesser quality. There was excitement in the air when tung oil production was on the rise and offering riches to investors and farmers. But today, the tree that held so much financial promise and captured people's dreams has been relegated to a FLEPPC Category II exotic pest plant, an ignominious end for the tung oil tree.

References available from the author. Karen Brown, University of Florida, IFAS-Center for Aquatic and Invasive Plants, [kpbrown@ifas.ufl.edu](mailto:kpbrown@ifas.ufl.edu), (352) 392-1799.

**Editor's note:** The following article appeared in the March 2005 issue of *Frontiers in Ecology and the Environment*, a journal of the Ecological Society of America. It is reprinted with permission.

# The tragedy of the commons revisited: Invasive Species

by Sarah Reichard, University of Washington, Seattle, WA

In the classic paper “The tragedy of the commons,” Garret Hardin (1968) explored the conflict that arises when an individual benefits from actions that may bring harm to others. He challenged the philosophical assumption of Adam Smith (1776, reprinted in 1936) that decisions reached individually will be the best decisions for an entire society and advocated “social arrangements” that produce responsibility. These arrangements might include some form of “mutually agreed upon coercion,” although perhaps “coercion and incentives” more accurately describes his intentions.

Just as an individual who benefits from grazing cattle on the village commons may be depleting the resource for others, importers generally benefit from introduced invasive species that may cause harm in some way. These introduced species cause enormous economic (Pimental *et al.* 2000) and environmental (Mack *et al.* 2000) problems, including competition for resources, alteration of ecosystem properties such as nutrient cycling and hydrology, and increased disturbances. Controlling problem species often requires application of pesticides and mechanical controls that are harmful to non-target species. Economic damage includes the loss of fisheries, forests, and suitable farmland, and the cost of control.

Many species that become invasive are introduced intentionally as pets, garden or aquarium plants, for recreational fishing, or for agricultural use. Others arrive accidentally as a by-product of commerce, for instance through ballast water discharge or as stowaways in shipping materials. Those choosing to import the pets or plants benefit financially. People engaged in international trade also benefit financially and risk allowing harmful pests to hitchhike from country

to country. Unfortunately, the choice that those individuals make – to profit by importing biological organisms – may impact others far removed from them. Ranchers in the western states battle introduced weeds, forests needed for forest products, recreational use, and wildlife habitat are decimated by pathogens and diseases, and near-shore environments are irrevocably altered by contaminated ballast discharge. One party benefits, while others suffer the consequences.

How do we determine an acceptable “social arrangement?” One solution might be to ask those importing biological organisms or engaged in international shipping to voluntarily take responsibility for the choices they make. This could include developing and implementing best management practices for their industry, and integrating them into daily routines. For instance, the International Chamber of Shipping developed its first voluntary environmental code, dealing

primarily with marine and atmospheric pollution, in 1993. When it was later revised they cited improvements; for example, the amount of oil lost was halved after these voluntary policies were adopted, despite a 76% increase in oil transporting tonnage during that time (ICS 1999). They acknowledged that better regulatory control was a factor in this improvement, but claimed that increased environmental awareness among shippers and seafarers, in addition to the actual recommended practices, also contributed. This pinpoints one problem with such voluntary practices: their direct effects are difficult to quantify.

Many invasive plants were originally introduced for horticultural use, using appropriate plant introduction methods of the time (Reichard and White 2001). It is clear, however, that those methods failed to recognize the consequences to the commons. In 2001, representatives from nurseries, botanic gardens, land-

*continued on page 8*

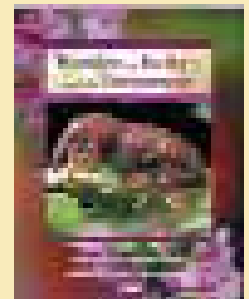
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scape architects, the gardening public, and local, state, and federal government met at the Missouri Botanical Garden to develop codes of conduct for their constituents. The resulting codes have been endorsed by the professional organizations of these disciplines and approximately 30 other organizations. Some of these groups have begun the often difficult process of implementing the codes, but whether industry support will be sufficient for change is unknown; it is still a "social arrangement experiment" in progress.

If the environmental community wants industry to change their practices, we must be ready to assist them; we have

the expertise industry needs. For instance, almost all of the codes of conduct for plants call for interdisciplinary groups to determine which new species are likely to become invasive and which already problematic species should be removed from inventories and gardens. Many botanists have essential knowledge about plant life histories and disturbance ecology, and a greater access to peer-reviewed literature that could be invaluable in affecting these changes. This can be our contribution to the social arrangement.

But to what extent can we expect these voluntary efforts to work? Is it

inevitable that they will be insufficient to produce a satisfactory level of change because irresponsible people within an industry will not follow them? How long will it take to learn whether these measures will be successful and, more importantly, how can we determine success? The best solution is to begin developing and implementing a more restrictive regulatory framework along with the voluntary efforts, conforming with the National Management Plan developed by the National Invasive Species Council (NISC 2001). This will include expanding our base of relevant science, determining what agencies should be involved and whether the current agency responsibilities should be adjusted. It could increase funding for inspections, assessments, and early detection of, and rapid response to, new invasions. As these steps are taken, the voluntary efforts should be assessed and the regulations adjusted to provide an appropriate social arrangement between those introducing species and those battling them.

We must take steps now to prevent the introduction of new pest species. Finding solutions that provide protection for the environment, while respecting the needs of industry, will require open minds and committed individuals.

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# Meet the Southeast Exotic Pest Plant Council

The Southeast Exotic Pest Plant Council (SE-EPPC) was formally established on March 20, 1999 at the first annual Southeast Exotic Pest Plant Council Symposium hosted by the Tennessee EPPC in Oak Ridge.

SE-EPPC is an umbrella organization with state chapters and affiliates. The state chapter is the most functional unit with a board of directors; an affiliate occurs in the absence of a state chapter where activity is based in an existing organization; i.e., an exotic pest plant committee of a state native plant society. In states where there is no organization, individuals are simply members of SE-EPPC. Chapters receive non-profit status under SE-EPPC. State chapters operate autonomously but are required to adhere to the SE-EPPC mission goals.

The SE-EPPC conducts an annual symposium hosted by different chapter states from year to year. Their 2006 meeting will be held in Raleigh, NC from May 23rd – 25th. All are welcome and encouraged to attend. [www.se-eppc.org](http://www.se-eppc.org)



## SE-EPPC Officers



**Brian Bowen** (President) was a founding member of SE-EPPC and served as part time coordinator from 1999 to 2002. He has been president since 2002. He is the past president of TN-EPPC and past chair of NAEPPC. He is the Administrator for the Tennessee Natural Areas Program. He has an MS in biology from Middle Tennessee State University.



**Joyce Bender** (Vice President) has been managing the Kentucky State Nature Preserves System since 1986. She is the president of the KY-EPPC.



**Kristen Gounaris Allen** (Secretary) has a B.S. in Applied Ecology from Rutgers University and an M.S. in Plant Ecology from the University of Maryland. Her post-graduate career has consisted of 7 years, in various positions dealing with exotic pest plants, with the National Park Service. She is currently the Biologist for Richmond National Battlefield Park in Virginia.



**Tony Pernas** (Treasurer) is the coordinator for the Florida/Caribbean Exotic Plant Management Team for the Florida and Caribbean Office of the National Park Service in Palmetto Bay, Florida. He is a board member of FLEPPC. He received his Bachelors Degree in Environmental Studies from Florida International University.

## Board of Directors



**Jim Burney** (FLEPPC Chair) has a Master's degree in biological sciences from the University of Central Florida and is certified as a Professional Wetland Scientist by the Society of Wetland Scientists. He is president of Aquatic Vegetation Control, Inc.

**Pam Robinson Ferral** (SC-EPPC) is the Director of Science and Stewardship for the South Carolina Nature Conservancy in Columbus.



**Connie Gray** (President, GA-EPPC) is the Ecological Resource Specialist for DeKalb County Parks & Recreation. With some 30 years experience working with plants, she has devoted the last 18 to restoration and management of natural areas in her native state.



**Robin Mackie** (USDA Forest Service Liason to the SE-EPPC) is the founder of the SC-EPPC and has been a botanist and ecologist with the U.S. Forest Service in South Carolina for 15 years.



**Bennie Moore** (President, AL-IPC) is a Conservation Agronomist with the Natural Resources Conservation Service.



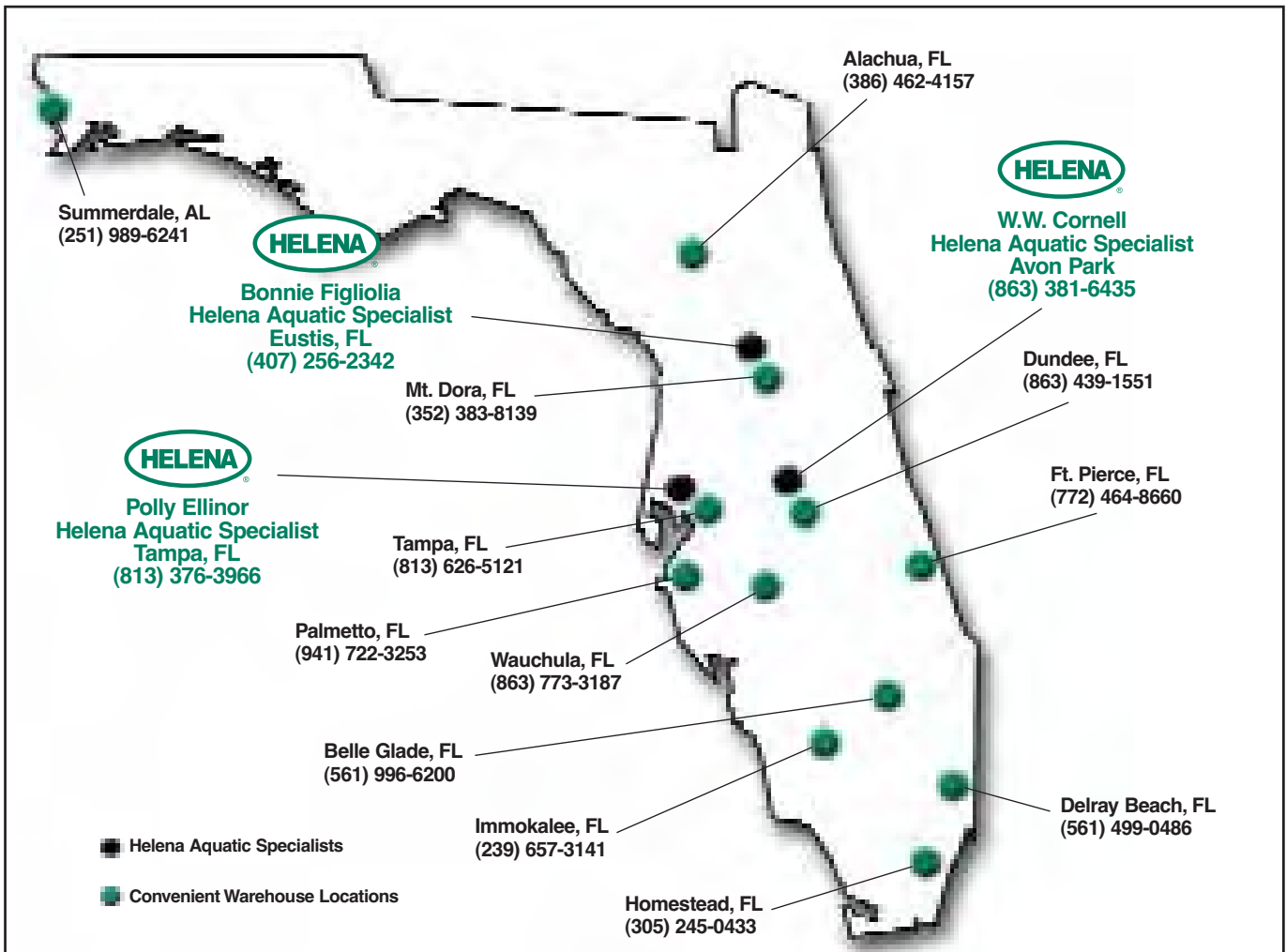
**Johnny Randall** (President, NC-EPPC) received a bachelors degree in biology from the University of North Carolina at Charlotte and M.S. and Ph.D. degrees in Botany from Virginia Polytechnic Institute and State University. He has been Assistant Director for Conservation at the North Carolina Botanical Garden since January 1998. He conducts research on invasive exotic species' effects on the reproductive ecology of native plants.



**Jack Ranney** (TN-EPPC) is a semi-retired research ecologist and adjunct professor in forestry at the University of Tennessee who serves as Invasive Species Leader for the Southern Appalachian Man and Biosphere. He is the former director of the Southern Appalachian Cooperative Ecosystem Studies Unit.



**Dave Thompson** (President, MS-EPPC) is a Landscape Architect working with the Mississippi DOT. He coordinates with Mississippi State University on research of herbicides and invasives, and acts as a point of contact for MDOT on invasive species issues.



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# FLEPPC Education and Outreach Small Grants

Request for Proposals - FY 2006 • Proposal Due Date: March 1, 2006

The Florida Exotic Pest Plant Council is soliciting grant proposals for non-native invasive plant education and outreach projects in the State of Florida. The intent of these grants is to provide funding to organizations or individuals who wish to educate the public about non-native invasive plants and their effect 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:

- ✓ involves a plant or plants listed on FLEPPC's 2005 List of Invasive Species (found at [www.fleppc.org](http://www.fleppc.org))
- ✓ educational message will reach a large segment of the community
- ✓ includes partnerships (please specify type and degree of involvement for partner entities)
- ✓ demonstrates matching funds or in-kind contributions
- ✓ increases local community awareness of non-native plants through local charettes, volunteer events, web site development, and distribution of educational materials
- ✓ assists local communities in developing area specific non-native plant control ordinances and programs
- ✓ heightens community awareness about non-native invasive plant identification, control, and prevention
- ✓ first time applicants and new projects, although repeat applicants still will be considered.

For more information and application instructions, visit the FLEPPC website at [www.fleppc.org](http://www.fleppc.org) or contact:



Leesa Souto • FLEPPC Education Committee Chair  
UCF-Stormwater Management Academy  
108 S. Babcock Street • Melbourne, FL 32901  
Phone: 321-722-2123 • Email: [lsouto@mail.ucf.edu](mailto:lsouto@mail.ucf.edu)

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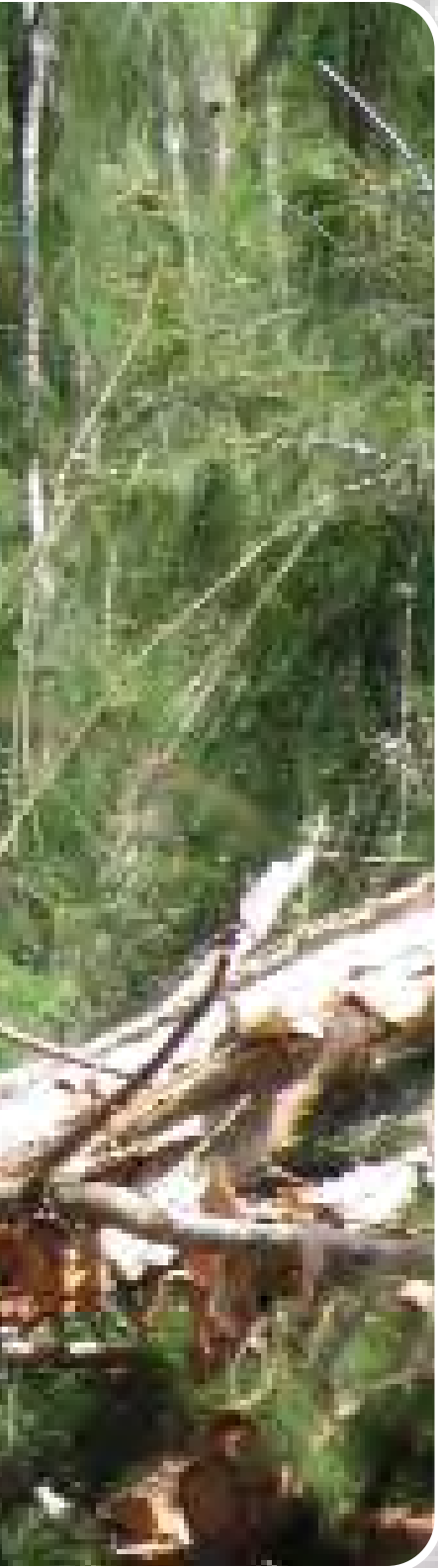


# MONSTER



Tracked skid-steer with feller buncher cutting Australian pines. Note the attached herbicide tank above the saw blade, which is push-button operated by the driver to treat the stump. Articulating arms grab the tree and stack it.

# MECHANICAL WEED CONTROL



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Barco Chipper cutting melaleuca trees.

STEVE AUSMUS, USDA, ARS



Brontosaurus cutting Melaleuca trees.

MARISOL AMADOR, UF-IFAS



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TODD OLSON, AQUATIC VEGETATION CONTROL

# Plan now to enter the 1st Annual FLEPPC Photo Contest!



FLEPPC is holding its first annual FLEPPC Photo Contest with awards to be presented at the 2006 Annual Symposium in Gainesville, Florida.

You must be a current FLEPPC member to participate, but you need not be present at the symposium to win. More than one photograph may be submitted, but no more than three from any one photographer.

## Categories include:

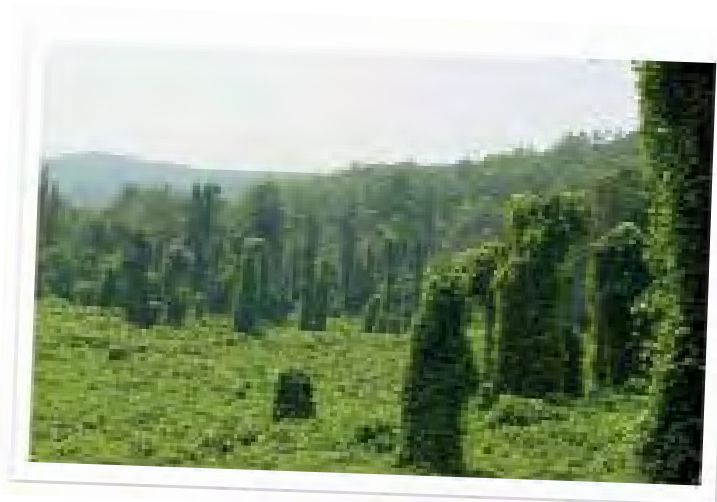
- natural area landscape infestation
- close-up of a Category 1 or 2 exotic pest plant
- before/after control (two photos)
- weed workers working
- humor
- artistic

Winners will be chosen at the symposium by members of the FLEPPC Photo Contest Committee and winning photographs will be published in **Wildland Weeds** magazine and on the FLEPPC website.

Photos may be digital or film, but a print must be submitted for the contest entry. Prints should be 5" x 7" or 8" x 10". The photo committee asks that photos not be digitally enhanced or altered, except for the humor and artistic categories in which digital alterations are optional.

To enter, please obtain an entry form from the FLEPPC web site ([www.fleppc.org](http://www.fleppc.org)) and submit one with each photograph to be entered (no more than three from any one photographer). Participants may bring their entries to the symposium or mail them to:

Karen Brown  
FLEPPC Photo Contest  
7922 NW 71st Street  
Gainesville, FL 32653



Have fun and good luck!

# Kentucky EPPC Trains Forestry Personnel

by Joyce Bender, KY EPPC President

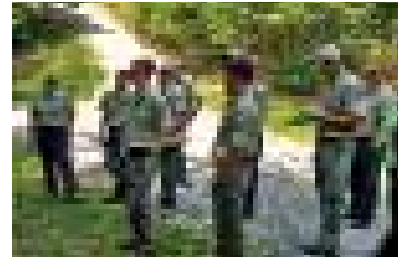
The Kentucky Exotic Pest Plant Council (KY EPPC) recently trained service foresters across Kentucky in invasive plant identification and control. With a \$10,000 grant from the state Division of Forestry (DOF), two workshops were held for personnel from the western and eastern regions. A total of sixty foresters attended the two-day trainings held at Mammoth Cave National Park in April and in May at Eastern Kentucky University's Maywoods Environmental and Educational Laboratory.

Among the many duties of service foresters is helping landowners develop management plans for their properties. Some management recommendations in previous years conflicted with the KY EPPC invasive plant list and led to some confusion for landowners and Forestry staff alike.

Training included classroom lectures on the impacts of invasive plants, controlling them, developing vegetation management plans and using native plants as alternatives. Each recipient received a number of handouts including the TN and KY EPPC Plant Flash Cards now available for downloading from the SE-EPPC website ([www.se-eppc.org](http://www.se-eppc.org)). Outdoor training covered field identification and additional information on control methods.

Responses from attendees were very positive and the Kentucky EPPC is confident that the Division of Forestry met their goal to improve staff understanding of the invasive plant issue. The DOF is hopeful that their foresters will be better able to answer questions from the public and to educate them about the impacts of invasive plants on Kentucky's natural resources.

Joyce Bender, Nature Preserves and Natural Areas Branch Manager, Kentucky State Nature Preserves Commission, 801 Schenkel Lane, Frankfort, KY 40601, (502) 573-2886, [www.naturepreserves.ky.gov](http://www.naturepreserves.ky.gov), [Joyce.Bender@ky.gov](mailto:Joyce.Bender@ky.gov)



[top] Division of Forestry staff at the Maywoods workshop.

[bottom] KY EPPC Board member David Taylor explaining invasive plant identification.



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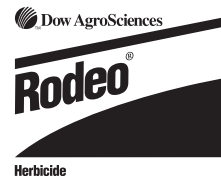
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# The City of Greenacres – A good place to live

by Seretha George, Planning and Engineering Department

Edgar Allan Poe defined landscape design as poetic, presenting characteristics of trees, flowers, and grass not only as aesthetically pleasing to a community, but as a mesmerizing art to the individual eye.

Just for a moment, stroll with me through our wonderful City of Greenacres and, along the way, witness the breathtaking sights of diverse landscaping designs and maintenance that cultivate artistic individualism and community pride.

Take a look at the City's medians and right-of-ways consisting of native trees and shrubs. Another artistic landscape design almost seems surreal – the grass is velvety plush green, embedded with tall trees and exotic flowers.

The fundamental nature of landscaping is that properly maintained trees, shrubs, flowers, and grasses are beautiful designs. The City strongly believes that landscaping is an important element in preventing neighborhood blight, as well as preserving the investment within the community. The City of Greenacres proudly and proactively places great efforts in preserving and enhancing the appearance, character, and value of the City's neighborhoods and has many programs in place to assist residents and business owners in creating and maintaining their landscapes.

The mission of the Planning and Engineering Department is to support the City of Greenacres' citizens and Council in their vision to live and work in a healthy, safe, and attractive community. This shared vision encourages a strong sense of community pride, continued dedication, and genuine care through public awareness, City policy, and community practice. The City's public awareness campaign focuses on educating, informing, and familiarizing our citizens, business owners, students and developers, as well as the rental and homeowner communities, about the landscape standards and maintenance requirements within the City. Thus, the Planning and Engineering Department created professionally designed, full-color brochures and, to date, has distributed over 1,700 copies.

- In 2003, staff mailed landscape maintenance guides to all of the registered homeowner associations and landscape companies within the City.
- In 2004, landscape maintenance guides were sent to commercial property owners within the City. Staff noted that in many cases, commercially zoned properties are owned by non-residents who may not have current information on the City's maintenance requirements. Consequently, property can remain in non-compliance due to dead, dying, diseased, or missing trees and plant materials, resulting in the property and neighborhood becoming aesthetically unattractive.

The long-term goal of this project is to preserve and protect the appearance, character, and value of the City's communities by promoting a sense of pride in the appearance of the community for those who live in the area, as well as those who visit. The City believes that a continued commitment to public education helps create a more positive and supportive environment. The intent of the City's Landscape Maintenance Guide is:

- to provide public awareness of the trees and shrubs both prohibited and preferred with requirements for their maintenance,
- to encourage innovation in the use of landscape materials in cost-effective and low-maintenance ways,
- to educate citizens and interested parties about the importance of continuously interrelating general maintenance and beautification initiatives.

The Landscape Maintenance Guide is available at City Hall and on the City's website (<http://www.ci.greenacres.fl.us/>) under Planning and Engineering Department. A few of the excellent information tools located within the guide include a list of trees and shrubs currently prohibited and those currently preferred:

## Prohibited Trees In All Circumstances

- Australian Pine
- Brazilian Pepper
- Earleaf Acacia
- Melaleuca
- Schefflera

## Prohibited Species for Satisfying Required Landscaping

### Trees

- Areca Palm
- Black Olive\*
- Calophyllum
- Ficus\*
- Golden Rain Tree
- Hibiscus
- Hong Kong Orchid
- Sea Grape
- Silk Oak
- Toog

### Shrubs

- Ficus\*
- Hibiscus\*
- Ixora\*
- Scaevola
- Selloum

\*May be allowed under specific circumstances and with city approval.

## Preferred Species

- Bald Cypress
- Dahoon Holly
- Laurel Oak
- Live Oak
- Red Maple
- Slash Pine
- Satin Leaf
- Sabal Palm
- Southern Magnolia
- Southern Wax Myrtle

The City of Greenacres is very pleased with the outcome of this project. Thanks to funding in part by the **Florida Exotic Pest Plant Council**, the project enabled the City to meet its goals by providing essential information to property owners within the commercial districts as well as all other citizens and interested parties. This has consequently led to attractive communities while creating good intergovernmental relationships. The City of Greenacres continues to work with the Palm Beach County Environmental Resource Management Department and the Florida Exotic Pest Plant Council to provide up-to-date and accurate information to our citizens and businesses, while also developing diverse strategies to create public awareness of preferred native trees and shrub materials, and their maintenance requirements.

Seretha George, City of Greenacres, Planning & Engineering Department, 5985 10th Avenue North, Greenacres, Florida 33463; 561/642-2054; [SGeorge@ci.greenacres.fl.us](mailto:SGeorge@ci.greenacres.fl.us)

# REQUEST FOR PROPOSALS FOR INVASIVE PLANT RESEARCH

**Deadline: February 27, 2006**

The Florida Exotic Pest Plant Council (FLEPPC) annually funds 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 27, 2006. Funding is limited to \$2,500. per project. The proposal should include a summary of the research project and its relationship to Florida exotic plant management problems. Plant species involved in the study must be one or more of the Category I or Category II exotic pest plant species listed by FLEPPC ([www.fleppc.org](http://www.fleppc.org)). 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), stipend for applicant's project work time not otherwise supported, travel funds for presentation of the research, 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.

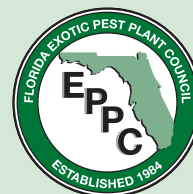
Proposals will be evaluated and ranked on the critical management need for scientific results in the area of study and on the clarity of the submitted request.

## **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 Florida invasive plant listed by FLEPPC as Category I or II (<http://www.fleppc.org>). An accompanying letter of recommendation from a faculty advisor is strongly encouraged.

## **Send proposals by e-mail, fax, or mail to:**

John C. Volin, Chair  
Research Committee, FLEPPC  
Florida Atlantic University  
2912 College Ave.  
Davie, FL 33314  
[jvolin@fau.edu](mailto:jvolin@fau.edu)  
FAX - (954) 236-1099  
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**Proposals are due by 5:00 p.m. February 27, 2006.**



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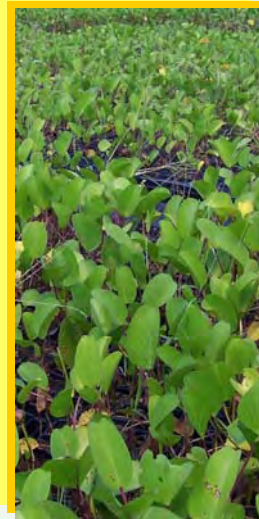
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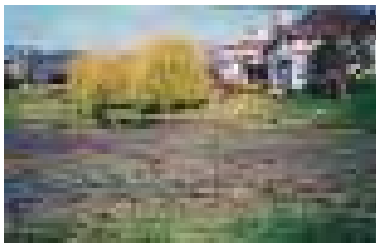
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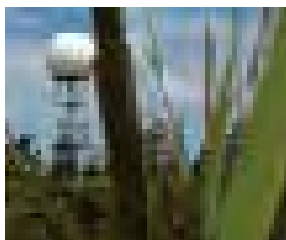


# Pine Rockland Restoration in South Florida

by Lauren Linares, Scheda Ecological Associates

There are hurricanes in Florida, and there are invasive plants. This year, the National Oceanic and Atmospheric Administration (NOAA) decided to tackle both.

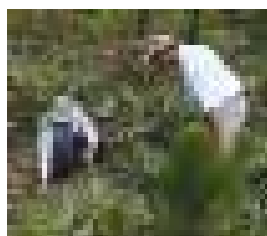
NOAA implemented a plan to eradicate exotics at its 10-acre National Weather Service (NWS) radar facility in Miami-Dade County, where the main offender is Burma reed, *Neyraudia reynaudiana*. The project is especially important because the property is a pine rockland, a globally imperiled South Florida ecosystem (according to the Florida Natural Areas Inventory) of which 98% has been destroyed.



Burma reed in foreground with Doppler radar in background

“Management of invasive plants is a critical step in successful restoration of an infested pine rockland site,” says Chris Bergh, director of the Nature Conservancy Florida Keys Program, and chairman of the Pine Rockland Working Group. “In addition to competing directly with native plants, some invaders dramatically alter the fire regime of the infested site. By increasing fire fuel loads, species like Burma reed can create conditions that favor overly frequent and overly intense fires that negatively alter the makeup of the entire natural community.”

Scheda Ecological Associates (SEA) was contracted to restore the NWS site and was more than happy to take on the challenge. Justin Parsons, eradication crew foreman of Aquagenix, and I went



Project Manager Lauren Linares shows cautious Meteorologist-in-charge Rusty Pfost a tiny pine rockland endemic.

to work documenting the many listed and endemic pineland plants that needed protection during work activities.

Specially trained crew then began cutting Burma reed with machetes, and tying the grass into bundles for removal. The reed was allowed to partially regrow before crewmembers carefully applied herbicide using backpack sprayers. Exotic trees were chopped and immediately received a cut-stump herbicide treatment.

The federal government deserves kudos for recognizing the importance of this endeavor. I can't think of a better way to serve the environment than to knock out enemy plants while restoring a unique habitat that has almost disappeared.

The first round of the NOAA project is now complete. There will be follow-up treatments throughout the year, and documentation of the pineland plants that pop up their heads now that sunlight has reappeared. Coontie (*Zamia pumila*) was among the first plants to take advantage of the new sunlight after the tall Burma reed was cut.



Lauren Linares is a Senior Environmental Scientist at Scheda Ecological Associates in West Palm Beach, Florida. Contact her at [LLinares@scheda.com](mailto:LLinares@scheda.com) or 561-689-9198.

## National Weather Service Radar Facility 2005 PLANT SPECIES LIST

PINELAND PLANTS	COMMON NAME	LISTING	PINELAND PLANTS	COMMON NAME	LISTING
<i>Abrus precatorius</i>	Rosary pea	<b>FLEPPC Cat. 1</b>	<i>Metopium toxiferum</i>	Poisonwood	
<i>Acacia auriculiformis</i>	Earleaf acacia	<b>FLEPPC Cat. 1</b>	<i>Morinda royoc</i>	Cheeseshrub	
<i>Albizia lebbek</i>	Woman's tongue	<b>FLEPPC Cat. 1</b>	<i>Myrsine floridana</i>	Myrsine	
<i>Anemia adiantifolia</i>	Pine fern		<i>Nephrolepis</i> sp.	Sword fern	<b>FLEPPC Cat. 1</b>
<i>Angadenia berteroi</i>	Pineland allamanda	<b>State threatened</b>	<i>Neyraudia reynaudiana</i>	Burma reed	<b>FLEPPC Cat. 1</b>
<i>Byrsonima lucida</i>	Locustberry	<b>State threatened</b>	<i>Opuntia</i> sp.	Prickly-pear cactus	
<i>Callicarpa americana</i>	Beautyberry		<i>Pilobephis rigida</i>	Wild pennyroyal	
<i>Chamaecrista lineata</i> var. <i>keyensis</i>	Narrowpod Sensitive Pea	<b>State endangered</b>	<i>Pinus elliottii</i> var. <i>densa</i>	South Florida slash pine	
<i>Chamaesyce deltoidea</i> ssp. <i>deltoidea</i>	Deltoid spurge	<b>U.S. endangered</b>	<i>Piriqueta caroliniana</i>	Piriqueta	
<i>Chiococca parvifolia</i>	Snowberry		<i>Psidium longipes</i>	Long-stalked stopper	<b>State threatened</b>
<i>Cnidioscolus stimulosus</i>	Tread-softly		<i>Psychotria nervosa</i>	Wild coffee	
<i>Coccothrinax argentata</i>	Silver palm	<b>State threatened</b>	<i>Psychotria sulzneri</i>	Shortleaf wild coffee	
<i>Commelina erecta</i> var. <i>angustifolia</i>	Whitemouth dayflower		<i>Pteridium aquilinum</i>	Bracken fern	
<i>Crossopetalum ilicifolium</i>	Quailberry	<b>State threatened</b>	<i>Quercus pumila</i>	Running oak	
<i>Croton linearis</i>	Pineland croton		<i>Randia aculeata</i>	White indigoberry	
<i>Dichromena floridensis</i>	White-topped sedge		<i>Rhus copallina</i> var. <i>leucantha</i>	Southern sumac	
<i>Dyschoriste angusta</i>	Everglades twinflower		<i>Ruellia succulenta</i>	Wild petunia	
<i>Flaveria lineata</i>	Yellowtop		<i>Sabal palmetto</i>	Cabbage palm	
<i>Galactia pinetorum</i>	Pineland milk-pea		<i>Schefflera actinophylla</i>	Umbrella tree	<b>FLEPPC Cat. 1</b>
<i>Guettarda scabra</i>	Rough velvetseed		<i>Schinus terebinthifolius</i>	Brazilian pepper	<b>FLEPPC Cat. 1</b>
<i>Heliotropium polyphyllum</i>	Pineland heliotrope		<i>Serenoa repens</i>	Saw palmetto	
<i>Jacquemontia curtisii</i>	Pineland jacquemontia	<b>State threatened</b>	<i>Smilax</i> sp.	Greenbrier	
<i>Lantana camara</i>	Lantana	<b>FLEPPC Cat. 1</b>	<i>Stachytarpheta jamaicensis</i>	Blue porterweed	
<i>Lantana depressa</i> var. <i>depressa</i>	Shrub verbena	<b>State endangered</b>	<i>Stillingia sylvatica</i>	Queen's delight	
<i>Lantana involucrate</i>	Wild sage		<i>Tetrazygia bicolor</i>	Tetrazygia	<b>State threatened</b>
<i>Leucaena leucocephala</i>	Lead tree	<b>FLEPPC Cat. 2</b>	<i>Toxicodendron radicans</i>	Poison ivy	
<i>Liatris</i> sp.	Blazing star		Various Asteraceae		
<i>Licania michauxii</i>	Gopher-apple		<i>Zamia pumila</i>	Coontie	<b>Comm. exploited</b>
<i>Melanthera parvifolia</i>	Small-leaved melanthera	<b>State threatened</b>			



## NATIONAL INVASIVE WEED AWARENESS WEEK

**WHAT:** Seventh Annual National Invasive Weeds Awareness Week

**WHEN:** February 26 to March 3, 2006

**WHERE:** Washington, DC

**WHO:** Organizations and Individuals who Support Invasive Weed Management and Ecosystem Restoration

The Seventh Annual National Invasive Weeds Awareness Week (NIWAW 7) will be held in Washington, DC the week of February 26 to March 3, 2006 to bring people and groups from across the country together to focus national attention on the severe problems created by invasive weeds. Individuals and organizations interested in this issue are invited to participate in this event and help build on the success of NIWAW activities in previous years. NIWAW 7 events are designed to focus on the important roles the Federal government must play to help the U.S. deal with invasive weed problems. We have also designed the schedule to provide ample time for attendees to meet with their Congressional delegations, individual federal agencies and each other.

NIWAW 7 is organized by the **Invasive Weeds Awareness Council**, a Washington, DC-based coalition dedicated to increasing awareness of invasive weed problems and the associated research and management needs. Although some events during the week are open to the public, access to the full array of activities will require payment of a modest registration fee.

For More Details Please Visit The NIWAW 7 Website

[http://www.nawma.org/niwaw/niwaw\\_index.htm](http://www.nawma.org/niwaw/niwaw_index.htm)

Four Points by Sheraton Hotel, 1201 K Street NW, Washington, DC is the Headquarters Hotel.

For additional information on NIWAW 7 contact: Dr. Nelroy Jackson 951-279-7787 or nelroyjackson@sbcglobal.net.

**NIWAW 7 Registration Deadline: February 1, 2006 • Hotel Reservations Deadline: January 26, 2006**

## CALL FOR ABSTRACTS

### 2006 Florida Exotic Pest Plant Council (FLEPPC)

#### 21st Annual Symposium

Gainesville, Florida • April 24th-26th, 2006

**Deadline for Abstract Submissions: February 1, 2006**

Abstract submissions for contributed oral or poster presentations are solicited for the 2006 FLEPPC 21st annual symposium, to be held Monday, April 24th through Wednesday, April 26th at the Paramount Resort in Gainesville, Florida.

Submissions are welcome for any area of invasive plant species investigation, including ecology, management, risk assessment, policy, and/or evolutionary biology, among others. Reports of interdisciplinary projects also are encouraged. For further information, please go to the FLEPPC web site ([www.fleppc.org](http://www.fleppc.org)), or contact Cheryl M. McCormick, FLEPPC Program Chair, University of Florida-IFAS, Center for Aquatic and Invasive Plants, 7922 N.W. 71st Street, Gainesville, FL 32653; 352-846-2516, [cheryl@ufl.edu](mailto:cheryl@ufl.edu)

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# Internodes

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## Mark your calendar

- Weed Science Society of America (WSSA) Annual Meeting, **February 13-17, 2006**, New York, NY, [www.wssa.net](http://www.wssa.net)
- National Invasive Weeds Awareness Week (NIWAW), **February 26 – March 3, 2006**, Washington, DC. [www.nawma.org/niwaw](http://www.nawma.org/niwaw)
- Association of Southeastern Biologists (ASB) Annual Meeting, **March 29 – April 1, 2006**, Gatlinburg, TN. [www.asb.appstate.edu/](http://www.asb.appstate.edu/)
- Florida Vegetation Management Association Annual Meeting, **April 19-21, 2006**, Daytona Beach, FL.
- Florida Exotic Pest Plant Council (FLEPPC) Annual Meeting, **April 24-26, 2006**, Gainesville, FL.
- UF-IFAS Aquatic Weed Control Short Course, **May 1-5, 2006**, Coral Springs, FL. <http://conference.ifas.ufl.edu/aw/>
- 14th International Conference on Aquatic Invasive Species, **May 14-19, 2006**, Key Biscayne (Miami), FL. [www.icaais.org/](http://www.icaais.org/)
- Florida Native Plant Society (FNPS) Annual Conference, **May 18-21, 2006**, Daytona Beach, FL. [www.fnps.org](http://www.fnps.org)
- Southeast Exotic Pest Plant Council (SE-EPPC) Annual Conference, **May 23–25, 2006**, Raleigh, NC. [www.se-eppc.org](http://www.se-eppc.org)
- Weeds Across Borders 2006, **May 25-28, 2006**, Hermosillo, Sonora, Mexico [www.desertmuseum.org/borderweeds/](http://www.desertmuseum.org/borderweeds/)
- Florida Lake Management Society (FLMS) Annual Meeting, **June 5-8, 2006**, St. Augustine, FL. [www.flms.net](http://www.flms.net)
- Aquatic Plant Management Society (APMS), Annual Meeting, **July 16-19, 2006**, Portland, OR. [www.apms.org](http://www.apms.org)

## Publications & Web Sites

- The Chinese tallow (*Sapium sebiferum*) Management Plan has been completed by the FLEPPC Task Force for this species, chaired by Dr. Cheryl McCormick. Chinese tallow occurs throughout Florida and is listed by the Florida Department of Agriculture & Consumer Services (FDACS) as a noxious weed. Copies of the management plan are available on the FLEPPC web site ([www.fleppc.org](http://www.fleppc.org)) or by contacting [cheryl@ufl.edu](mailto:cheryl@ufl.edu)
- *Cogongrass* (*Imperata cylindrica*) - *biology, ecology and management*, by G.E. MacDonald. 2004. *Critical Reviews in Plant Sciences* 23(5):367-380.
- *Invasive plants on the University of Florida campus: abundance, public opinion, and recommendations for management*, by A.J.W. Stodola. 2005. Master's thesis, Urban and Regional Planning, University of Florida, Gainesville. 155 pp. [astodola@ufl.edu](mailto:astodola@ufl.edu)
- *How Scientists Obtain Approval to Release Organisms for Classical Biological Control of Invasive Weeds*, J. Scoles, J.P. Cuda, W.A. Overholt. 2005. UF-IFAS, Florida Cooperative Extension Service, <http://edis.ifas.ufl.edu/IN607>
- *Invasive plants of range and wildlands and their environmental, economic and societal impacts*, edited by C.L. Duncan and J.K. Clark. 2005. 222 pp. Weed Science Society of America, [www.wssa.net](http://www.wssa.net). A comprehensive literature review documenting “losses associated with 16 of the most ecologically and environmentally important invasive plant species in the United States” using information from national databases, expert knowledge and over 750 scientific studies. Chapters include Sunflower, Mustard, Spurge, Pea, Loosestrife, Grass, Figwort, Potato and Tamarisk Families.

- The Florida Department of Environmental Protection (FLDEP) is spearheading an effort among numerous governmental agencies on the development of a statewide invasive species (flora & fauna) strategic plan. A goal of the **Invasive Species Working Group (ISWG)** is to determine the most effective way of developing a comprehensive statewide plan that unifies and coordinates the responsibilities of government agencies to prevent and manage harmful biological invasions in Florida. The plan can be downloaded from: <http://www.dep.state.fl.us/lands/invaspec/2ndlevpgs/ISWG.htm>
- *A Weed Manager's Guide to Remote Sensing and GIS*, (<http://www.fs.fed.us/eng/rsac/invasivespecies/>) provides information, technical guidance, and resources to help resource managers learn to use these technologies to predict weed invasion, map and monitor weeds, and educate the public about weeds. It also discusses integrating geospatial technologies into a weed management plan and using geospatial technologies to help implement the USDA Forest Service National Strategy and Implementation Plan for Invasive Species Management. Provided by the **USDA Forest Service Remote Sensing Applications Center**.
- *Invasive Exotic Plants in North Carolina*, (<http://www.ncwildflower.org/invasives/invasives.htm>) a project of the **North Carolina Native Plant Society**, ranks plants as Severe, Significant, or Lesser Threats, Naturalized – to be watched, and Problems in adjacent states.
- Go to the **Florida Native Plant Society's** website at: <http://www.fnps.org/index.php> and click on Landscaping for a list of native plants in your Florida county. Information is provided for each species including water requirements, salt tolerance, butterfly and wildlife attractiveness, and even some photos and fact sheets. See what's in your county!

## Nodes of Interest

- **FLEPPC Research Grants** were awarded for four new studies of exotic pest plants. Two will provide information to help improve management strategies for Brazilian pepper (*Schinus terebinthifolius*), one will study herbicide resistance in Old World climbing fern (*Lygodium microphyllum*), and one will focus on hydrology and the seed bank and seedling recruitment patterns of the tropical sedge (*Scleria lacustris*). See page 18 for a request for proposals for 2006.
- Kudzu (*Pueraria montana*) has been spotted in more than 30 Illinois counties, and the University of Illinois is working with the Illinois Department of Natural Resources (DNR) to keep it from spreading. George Czapar of the Springfield Extension Center of the University of Illinois is monitoring kudzu in Illinois and is part of an effort to control the exotic invasive vine.
- The **Union of Concerned Scientists** also is concerned about invasive species. Visit their website at [www.ucsusa.org/invasive\\_species/](http://www.ucsusa.org/invasive_species/)
- **Have you expired?** To find out, check the front of your **FLEPPC** quarterly newsletter above your mailing address. It will tell you when your membership expires. *Please keep it current so you can remain among us!*
- **Cute quote:** “I kind of want to be a science girl when I grow up.” – from a thank you note written by a Talbot Elementary School second-grader in Gainesville, FL after an invasive species presentation by Dr. Mike Netherland. It seems they were particularly impressed by the Spring 2005 cover of *Wildland Weeds* showing an alligator swimming away with a Burmese python in tow. Brave little girl!

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