

Help Protect Florida's Natural Areas from Non-Native Invasive Plants¹

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THE PROBLEM

The Need for Natural Areas

More than one-half of Florida's land area is in agricultural or urban land uses, and native habitats are continually being lost. Continued urbanization is an inevitable consequence of increasing population, and food production by agriculture is essential. However, preserving and protecting Florida's native habitats for historical significance and to protect native species, water quality and water quantity is also essential. Natural areas have been designated on federal, state, county, city, and private lands (Figure 1).

Weeds in Natural Areas

Weeds are undesirable plants. Homeowners battle weeds in their lawns, gardens, and ponds. Weeds are considered unsightly in parks and playgrounds. Weeds interfere with transportation and can cause hazardous conditions along highways, railroads, and waterways. Foresters control weeds to enhance the growth of commercial forests. In the United States alone, farmers spend \$8 billion annually to manage weeds; nevertheless, crop losses caused by weeds amount to \$10 billion annually.



Figure 1. Designating certain lands to be managed (or restored) as natural areas is one method of protection for native plant and animal communities.

Non-native invasive plants are weeds of natural areas. Non-native plants are those that exist outside of their natural ranges. Non-native invasive plants are those that form self-sustaining and expanding populations within plant communities with which they were not previously associated. They are weeds in natural areas because they displace native plants and associated wildlife, including endangered species, and can alter natural processes such as fire and water flow.

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Naturalists recognized potential problems with non-native invasive plants many years ago. In 1920 Charles Torrey Simpson, Florida's pioneer naturalist, wrote, "there are the adventive plants, the wanderers, of which we have, as yet, comparatively few species; but later, when the country is older and more generally cultivated, there will surely be an army of them." As predicted, problems associated with non-native invasive plants have increased through the years and non-native invasive plants are now a growing concern to scientists and land managers. Twenty-nine percent (about 1,200) of the plant species growing on their own without cultivation in Florida are non-native (Wunderlin, Hansen. 2003), and some of these have become serious problems for land managers.

Control of non-native invasive plants in Florida's natural areas is expensive. Dade County Parks and Recreation Department has spent \$2.8 million since 1993 (after Hurricane Andrew) on removal of invasive plants from 500 acres of upland natural areas. Since 1986, partial control of melaleuca and Australian pine in the East Everglades, adjacent to Everglades National Park, has required 14,000 labor hours and \$546,000 in herbicide and helicopter costs. Twelve million dollars were budgeted to control hydrilla and waterhyacinth in Florida's waterways in 1995. Millions of dollars are spent in efforts to locate natural enemies of non-native invasive plants in their native range. These enemies are then released here to act as biological controls of specific non-native plants.

Regulated Plants

Federal and state laws were passed beginning in the 1970s to prevent further spread or importation of weeds that pose an economic threat to agriculture and navigation. These laws now restrict possession, transport, or sale of certain plants known to interfere with agroecosystems, native ecosystems, the management of ecosystems, or cause injury to public health. Weeds are listed in the United States Department of Agriculture's (USDA) *Federal Noxious Weed List* (<http://www.aphis.usda.gov/ppq/permits/fnwsbycat-e.PDF>), the Florida Department of Agriculture and Consumer Services' (FDACS) *Florida Noxious Weed List*, (<http://doacs.state.fl.us/pi/noxious-list.htm>) and the

Florida Department of Environmental Protection's (DEP) *Prohibited Aquatic Plant List* (<http://www.dep.state.fl.us>) Plants that occur on at least one of these lists and may occur on private property in Florida include cogongrass (*Imperata cylindrica*, Figure 2), Brazilian pepper tree (*Schinus terebinthifolius*, Figure 3), Australian pine (*Casuarina* spp., Figure 4), tropical soda apple (*Solanum viarum*, Figure 5), catclaw mimosa (*Mimosa pigra*, Figure 6), Australian paperbark (*Melaleuca quinquinervia*, Figure 7), and Chinese tallow (*Sapium sebiferum*, Figure 8), Old World climbing fern (*Lygodium microphyllum*, Figure 9), carrotwood (*Cupaniopsis anacardioides*, Figure 10), air potato (*Dioscorea bulbifera*, Figure 11) and skunk vine (*Paederia foetida*, Figure 12). In addition to plants that are regulated at the federal and state levels, 21 Florida counties and cities have ordinances that prohibit planting or require removal of 45 non-native plant species.



Figure 2. Cogongrass (*Imperata cylindrica*) has invaded many habitats such as sandhills, flatwoods, grasslands, swamps, river margins, and dry sand dunes throughout Florida and other southeastern states. It is listed as a noxious weed by FDACS and USDA.

EPPC List of Non-native Invasive Species

The Florida Exotic Pest Plant Council (EPPC) has listed species considered to be most invasive or potentially most invasive in Florida. "Category I" plants on this list are considered to be non-native invasive plants that are currently disrupting native plant communities in certain areas or throughout the state. "Category II" plants have the potential to disrupt native plant communities. While many plants on this list are also included on prohibited lists, the



Figure 3. Brazilian pepper tree (*Schinus terebinthifolius*) was introduced to Florida in the 1840s as a cultivated ornamental. It is an extremely invasive plant that invades fallow farmland, pinelands, and hardwood hammocks of south and central Florida, and mangrove forests as far north as Levy and St. Johns counties. It is prohibited by DEP and listed as a noxious weed by FDACS.



Figure 5. Tropical soda apple (*Solanum viarum*), first collected from Florida in 1988, is now a common weed on 500,000 acres of pastures, roadsides, ditchbanks, cultivated land and natural areas. It is prohibited by DEP and listed as a noxious weed by FDACS and USDA. Credits: Photo by Jeff Mullahey



Figure 4. Australian pine (*Casuarina equisetifolia*) was introduced to Florida in the late 1800s and planted extensively in the southern half of the state. It is salt-tolerant and invades pinelands, sandy shores, and front-line dunes where it produces dense shade, litter accumulation and displaces native vegetation. It is prohibited by DEP. Credits:



Figure 6. Catclaw mimosa (*Mimosa pigra*) is a sprawling, prickly shrub that was first identified in Florida in 1953 and now occurs on 1,000 acres of river floodplain, swamp forest, and lake margins in Broward, Palm Beach, Marin, St. Lucie, and Highlands counties. It is prohibited by DEP and listed as a noxious weed by FDACS and USDA.

EPPC list itself does not carry statutory authority. Examples of EPPC "Category I" plants (in addition to the ones already listed as prohibited) include earleaf acacia (*Acacia auriculiformis*, Figure 13), bischofia (*Bischofia javanica*, Figure 14), and Chinaberry (*Melia azedarach*, Figure 15). The EPPC list is modified as merited by new observations. A copy of the EPPC's list of Florida's invasive plants can be obtained by contacting your County Cooperative Extension Service office, the UF/IFAS Center for Aquatic and Invasive Plants (352-392-9614) or on the EPPC Web site (<http://www.fleppc.org>).



Figure 7. Melaleuca, or Australian paperbark (*Melaleuca quinquenervia*), once widely planted in Florida, now forms dense thickets and displaces native vegetation on 391,000 acres of wet pine flatwoods, sawgrass marshes, and cypress swamps in the southern part of the state. It is prohibited by DEP and listed as a noxious weed by FDACS.



Figure 8. Chinese tallow (*Sapium sebiferum*), sometimes called popcorn tree, has been considered an invasive pest plant in the Carolinas since the 1970s and is expanding its range on the US Gulf Coast through Florida. It is widely dispersed by birds and thrives in undisturbed areas such as closed canopy forests, bottomland hardwood forests, shores of water bodies, and sometimes on floating islands. It is listed as a noxious weed by FDACS.

IFAS Assessment of Non-Native Plants in Florida's Natural Areas

UF/IFAS is assessing the characteristics of non-native plant species (those not prohibited by statute) in Extension Publications using the IFAS Assessment of Non-Native Plants in Florida's Natural Areas (<http://agronomy.ifas.ufl.edu/IFASassessmt.html>). The purpose of the assessment is to provide a well-defined mechanism by which all IFAS Extension



Figure 9. Old World climbing fern (*Lygodium microphyllum*) aggressively invades cypress swamps and tree islands in south Florida and carries both wildfires and prescribed burns through natural barriers. It is listed as a noxious weed by FDACS.



Figure 10. Carrotwood (*Cupaniopsis anacardioides*) is a popular landscape tree throughout southern Florida. It produces large crops of seed, which are eaten and transported by birds. It is now naturalized on spoil islands and in tropical hammocks, pinelands, mangrove swamps, cypress domes, scrub, and coastal strand communities. It is listed as a noxious weed by FDACS.

publications can conform in their description and categorization of non-native plants that are invading natural areas in Florida. None of the plant species in this publication has been assessed by this method to date. More information is available in EDIS publication SS-AGR-86 *The Story Behind the IFAS Assessment of Non-Native Plants in Florida's Natural Areas*.

In Our Own Back Yards

Non-native plants have been introduced as landscape ornamentals, aquarium plantings,



Figure 11. Air potato (*Dioscorea bulbifera*) can climb high into tree canopies and engulf surrounding vegetation. It is listed as a noxious weed by FDACS.



Figure 13. Earleaf acacia (*Acacia auriculiformis*), a messy tree in landscapes, invades disturbed areas as well as pinelands, scrub, hammocks, and pine rocklands in south Florida. It is not statutorily prohibited but is listed as invasive by the Florida EPPC.



Figure 12. Skunk vine (*Paederia foetida*) invades native plant communities in Florida and can create dense canopies leading to the death of native vegetation. The plant emits a foul odor, especially when the leaves are crushed. It is listed as a noxious weed by FDACS.

agricultural crops, and by accident. They now exist in our landscapes, and some are still sold commercially. Invasive non-native plants growing in proximity to natural areas are a source of invasion. Seeds and

spores can be spread by birds, animals, wind, and yard trimmings.

WHAT CAN WE DO?

Learn to Recognize Florida's Non-native Invasive Plants

Not everyone will want to learn to identify the entire list of invasive plants in Florida—at least not right away. A good start is to identify plants on your own property or plants sold in local nurseries, and determine if any are considered invasive. Most non-native invasive plants are included in various plant identification field guides, horticultural books, and botanical keys. Your County Cooperative Extension Office can assist with plant identification. A handbook, *SP 257 Identification and Biology of Non-Native Plants in Florida's Natural Areas*, is



Figure 14. *Bischofia* (*Bischofia javanica*) is a weedy tree in landscapes. It is common in old fields and disturbed wetland sites and also invades intact cypress domes and tropical hardwood hammocks of south Florida. It is not statutorily prohibited, but it is listed as invasive by the Florida EPPC, and its use has been discouraged by the FNGA.

available for sale from the IFAS Extension Bookstore at <http://ifasbooks.ufl.edu> (Ph: (352) 392-1764).

Prevention

When landscaping, do not use plants that have potential to be invasive in natural areas near where you live. Local land managers, park biologists, and county governments can provide information on invasive plants that are the greatest problem locally. At the University of Florida, long-range planning policy prohibits the use of many invasive species for future landscaping of its properties, and the University of Florida uses the EPPC "Category I" plant list as a guideline.

Remove Non-native Invasive Plants From Your Property

Removing non-native invasive plants from private property can eliminate a major source of



Figure 15. Chinaberry (*Melia azedarach*) occurs primarily in disturbed areas such as rights-of-way and fencerows and has begun invading floodplain hammocks, marshes, and upland woods, particularly in north Florida. It is not statutorily prohibited, but it is listed as invasive by the Florida EPPC, and its use has been discouraged by the FNGA.

invasion into natural areas. Many invasive plants, such as skunk vine, are also weeds in private landscapes. Others, such as carrotwood, may serve a function in the private landscape (as shade for example). Removal of these plants may seem a sacrifice for the property owner, but this loss can be a short-term problem. The plant removal will be of long-term, far-reaching benefit to Florida's natural areas.

Stumps of trees that are cut down should always be treated with a herbicide to prevent regrowth. After removal, invasive non-native plants can be replaced with native plants or with non-native plants that are *not invasive*. Information on how to control specific non-native invasive plants and suggestions for non-invasive plants to replace them with can be obtained from County Cooperative Extension offices.

Non-native invasive plants that are not removed from private property should be contained as carefully as possible, especially if the land is in proximity to sensitive natural areas. Carefully dispose of trimmed material from invasive plants, especially material with attached seeds or spores, or plant parts capable of vegetative reproduction, such as stems of oyster plant (*Rhoeo spathacea*). Volunteer to remove invasive plants from local natural areas under the guidance of the natural area manager. Groups such as "Pepper Busters" have been formed for this purpose.

Learn More

The following publications provide additional information about natural areas and problems caused by non-native invasive plants in Florida and around the world:

Collard, S. B., III. 1996. Alien invaders: The continuing threat of exotic species. New York: Franklin Watts.

Cronk, Q. C. B. and J. L. Fuller. 1995. Plant invaders. London: Chapman and Hall.

Luken, J. O. And J. W. Thieret (Eds.) 1997. Assessment and management of plant invasions. New York: Springer.

McKnight, B. N. (Ed.) 1993. Biological pollution The control and impact of invasive exotic species. Indianapolis: Indiana Academy of Science.

Randall, J. M. and J. Marinelli. 1996. Invasive plants: Weeds of the global Garden, Handbook #149. New York: Brooklyn Botanic Garden, Inc.

Simberloff, D., D.C. Schmitz, and T.C. Brown (Eds.). 1997. Strangers in paradise: Impact and management of nonspecies in Florida. Washington, D.C: Island Press.

SHARE THIS INFORMATION

The effort to protect Florida's public lands from non-native invasive plants will require cooperation among private property owners, public land

managers, elected officials and others. Share this information with your neighbors to get the ball rolling and keep it rolling.

REFERENCES

Wunderlin, R. P., and B. F. Hansen. 2003. Atlas of Florida Vascular Plants (<http://www.plantatlas.usf.edu/>). [S. M. Landry and K. N. Campbell (application development), Florida Center for Community Design and Research]. Institute for Systematic Botany, University of South Florida, Tampa, FL.

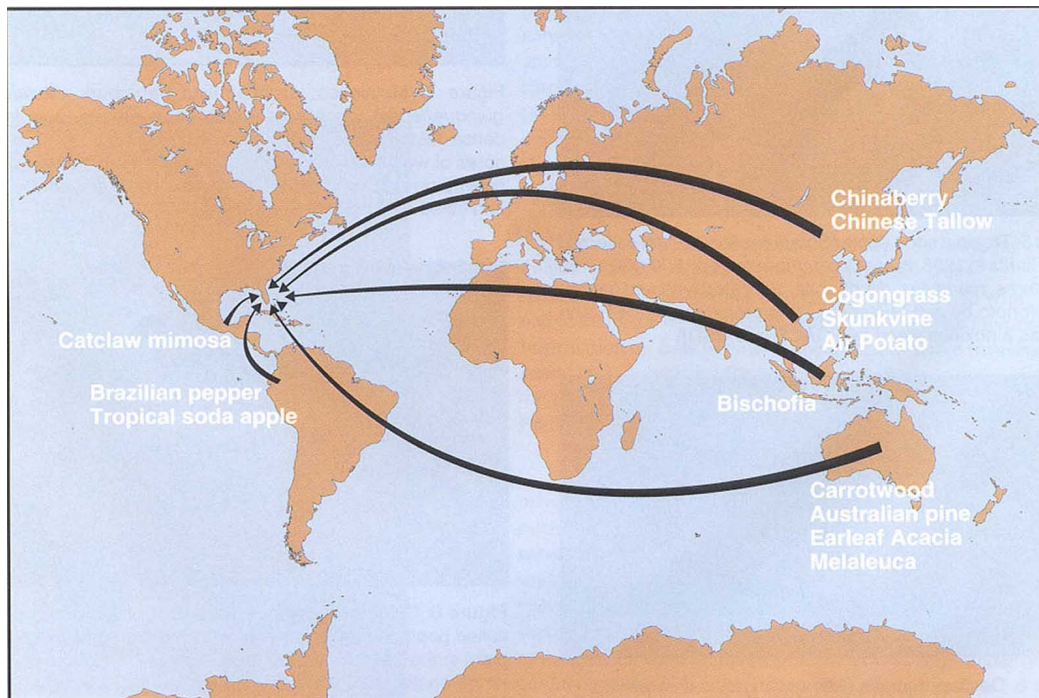


Figure 16. The origins of some non-native plants transported to Florida, either by accident or intentionally.