

TEACHING POINTS

about non-native invasive plants, and native plants, especially in Florida

A Companion Resource for the UF/IFAS CAIP Photo-Mural Set SP 336

Unfortunately, almost every place on earth is being invaded by plants from other places. Our coontail is invading South Africa. Sri Lanka's salvinia is invading the United States. Our native and desirable eelgrass is an unwanted invader of Australia's rivers. Burma's reed is growing wildly in south Florida, and we're finding it very difficult to manage.

There are thousands of species of plants in the United States, with more than 4,000 species known to be in Florida. About 3,000 of them are native plant species; the majority are terrestrial and can be found in our state natural areas. Natural areas are lands that have not been developed for agriculture, business, or housing; they are preserved because of their unique scenic, historic, geologic or ecological value.

Native plants provide food and shelter for animals, and provide stability to our shorelines and fields. They have evolved into their own ecological niches and grow in harmony and balance with other plants and animals. Because a native plant species usually does not take over an area, there is biodiversity. Florida is famous for its biodiversity. Biodiversity exists when species growth is constrained by natural factors, including

- Competition with other native species,
- Diseases,
- Feeding by insects and other animals,
- Climate.

Florida is also home to hundreds of native plants that live in damp to wet soils, and even underwater.

See the *Native Freshwater Plants* photo-mural, part of the 4-poster set, for examples of freshwater plants commonly found throughout the state.

In Florida, more than 1,000 plant species are “non-native.” They may also be referred to as “alien” or “exotic.” Non-native plants are those that have been introduced to Florida, purposefully or accidentally, from a natural range outside of Florida. Non-native plants represent about 25% of Florida's plant communities.

The term “non-native” usually refers to plants from other countries or continents. For example, kariba weed (*Salvinia molesta*) probably comes from Sri Lanka, and Brazilian pepper (*Schinus terebinthifolius*) comes from South America. However, “non-native” can simply refer to another region of a country: smooth cordgrass (*Spartina alterniflora*), which is native and desirable on the U.S. Atlantic coast, is invasive—covering oyster beds—when it grows as a non-native on the Pacific coast.

Some non-native plant species are “invasive.” The National Invasive Species Council defines “invasive” as “a species that is non-native to the ecosystem and whose introduction causes or is likely to cause economic or environmental harm or harm to human health.” Invasive plants are sometimes referred to as “nuisances,” “pests,” or “noxious.”

What's the problem? Invasive non-native plants can displace native plant communities and negatively affect other organisms. Invasive plants are able to gain an advantage because they usually do not have their natural enemies (diseases, insects, and other environmental stresses) keeping them in check.

Harm caused by non-native invasive plants has significant consequences:

- Native plants can be permanently eliminated, diminishing Florida's natural diversity;
- Animals that use native plants are often unable to adapt, so they leave the area or die off;
- Invasive aquatic plants can completely fill the water, driving fish and wildlife away;
- Boating, swimming, hiking and other uses can be made difficult, even dangerous, by invasive plant infestations.

IMPORTANT: “Non-native” is not the same as “invasive.” Many non-native plant species are *non-invasive*. As of 2011, about 130 non-native plant species were found to be invasive in Florida—about 10% of all non-native plant species found here.



Some non-native plants such as tomatoes, citrus trees, and other economic crops are obviously “good” and essential to human health and our economy. The plants are well-managed by the farmers who plant them and sell their valuable products. Our non-native food crops rarely spread as weeds.

Other non-native plants sold to the public also are benign—they don’t easily spread on their own or cause significant problems in the wild. For example, roses and other plants are cultivated for ornamental purposes in yards, parks, and gardens. Usually these non-native plants will not grow if left on their own. For many reasons (genetics, climate, soil, diseases, insects), some non-native plants simply will not survive unless humans take care of them. Therefore, we have little to worry about when it comes to certain non-native plants.

How do non-native plants get here? In all sorts of ways. Any of us could accidentally introduce non-native plants:

- Seed and plant fragments can be imported in nursery plants and soils;
- Misidentified or unknown plants from aquarium keepers, water gardeners, landscapers, and friends make their way into ponds or local waters;
- Whole plants or growing fragments are emptied into local waters from ship ballast water;
- Fruits and flowers are brought home in our vacation luggage.

How do plants spread? Plants reproduce and spread by several means. All flowering plants produce seeds. Some even grow flowers and are pollinated under water. Depending on the plant, its location and other circumstances, plants may spread when

- Their seeds are dispersed by wind, water, or birds and other animals;
- “Vegetative propagules” fall off and form new plants;
- The plant is somehow fragmented (such as by a boat propeller) and the plant parts regrow into new plants;
- Yard waste is taken elsewhere;
- The root system expands and gives rise to new plants.

In the past, some species were spread on purpose to change our natural areas. For example, melaleuca trees (*Melaleuca quinquenervia*) were introduced to Florida from Australia by spreading their seeds from airplanes over the Everglades. The idea was that the trees would soak up the water and make the Everglades better for human use. The plan resulted in millions of invasive melaleuca trees, now known to be destructive

to Florida’s environment. Melaleuca trees are being removed at a huge expense.

One of the most challenging things a natural resource management agency can do is predict which non-native plants might become invasive and which non-native plants will be benign. Sometimes, government agencies and plant growers or importers disagree. A grower may say there is not enough evidence to show a plant will be invasive while governing agencies believe there is reason for concern.

Undeniably, some non-native plant species that have already been introduced to Florida, will someday be invasive weeds. The question is, “How far should agencies go in preventing the import, growth, or sale of potentially invasive plants?” (We don’t want to continue to bring destructive species into the state.)

Some plants sold by nurseries and pet stores are invasive or are believed (by scientists) to have high invasion potential: certain bamboo and grass species, certain tree and vine species, certain aquatic species, and others. The Chinese tallow tree (*Sapium sebiferum*), a pretty shade tree, is an example of an invasive tree that was sold widely before it was discovered to be taking over some of Florida’s wetlands. In Paynes Prairie State Preserve near Gainesville, thousands of Chinese tallow trees spread into the landscape. As a result, a great deal of money is now being spent controlling this tree.

Another invasive non-native plant is hydrilla (*Hydrilla verticillata*), which was introduced as an aquarium plant and sold in stores. **Hydrilla grows quickly and now infests tens of thousands of acres in Florida alone. It has also spread to nearly 30 states as far away as Massachusetts and California.** Hydrilla requires constant management with chemicals and machines; management in Florida for this single species of plant costs millions of dollars each year.

By definition, native plants are not invasive. However, when a site becomes “disturbed” (from reduced water levels, large influxes of fertilizer, soil disturbances, etc.), certain native plants can proliferate. For example, native cattails (*Typha* species) are known for quickly filling in wet areas that have been disturbed or altered. They often become the dominant plant in man-made ponds and ditches. In the Everglades, cattails are crowding out the desirable saw-grass (*Cladium jamaicense*) that produce food and shelter for native Everglades animals. Nutrient increases and alterations to historic water levels have given cattails an advantage over saw-grass, although both are native plants. While native plants may be a nuisance at times, they are not invasive.

Invasive non-native plants must be controlled.

Because it's unlikely that an established invasive plant species can be eradicated from wild areas, we must practice "maintenance control." This means we must use all available tools to control the plants at the lowest desired level. "Maintenance" is the key word. We all understand how important it is to regularly maintain our health, homes, property, and equipment. The same is true if we are to assure the health of our natural areas and ecosystems. **Several control methods and strategies can be used to achieve maintenance control, depending on the habitat and the invasive plant.**

- **Biological control** uses insects, fish and other organisms that eat, infect or otherwise keep invasive plants at low levels indefinitely.
- **Chemical control** uses specially formulated herbicides (registered with the U.S. EPA) to kill or control invasive plants.
- **Mechanical control** uses machines to shear, crush, shred, press, pull and remove invasive plants.
- **Physical control** uses hand-pulling techniques, drawdowns (water removal), flooding, burning, dredging and shading to control invasive plants.
- **Integrated control** combines all appropriate plant control methods into a strategy that is compatible with the use and current conditions of a habitat.

Stewardship/Citizenship

Preventing the introduction and spread of invasive plants is the most effective and least expensive way to protect our natural habitats. **We can help control invasive plants by keeping them out of our landscape at home.**

When buying plants, discuss and confirm the correct plant identification with the vendor. Rinse aquatic plants in a bucket of tap water to remove any unwanted hitchhikers and/or insects.

When disposing of plants that have the potential to spread into nearby woods or waterbodies, completely dry or freeze the plants to kill them, and add them to household garbage that will not be composted. Incineration is a possible alternative.

Learn to identify invasive plants, as well as our native plants. It's not so difficult to learn a few plants that are interesting or important to you. If possible, learn them by scientific name. **Plant common names are confusing since they differ from region to region, and often are changed by personal or marketing whims.**

For example, *Nuphar advena* is commonly known as spatterdock, cow lily, pads, flags and bonnets—depending on who you talk to. Knowing the plant's scientific name simplifies communication and reduces confusion.

In scientific names, the first word is the genus name and the second word is the species. A genus is a group of closely related species. A species is a population of one kind that generally does not successfully interbreed with populations of other kinds. Thus, in the example *Eleocharis baldwinii*, **Eleocharis** is the genus name, and **baldwinii** is the species name. The term **Eleocharis spp.** refers to any of the 150 species in the *Eleocharis* genus.

Taxonomy is the branch of biology concerned with classifying organisms into groups based on similarities of structure or origin. Plant and animal taxonomy is arranged in a hierarchy, from phylum down to species. It can help to have a general understanding of this classification system:

Phylum
Class
Order
Family
Genus
Species

These Teaching Points were created to accompany a 4-poster set of large format, laminated plant photo-murals featuring native, non-native and invasive plants (UF/IFAS SP 336). They are free to K-12 teachers in Florida. For more information contact: **caip-education@ufl.edu**

A Useful Web Site ~ <http://plants.ifas.ufl.edu>
This web site includes photos and descriptions of more than 500 species of native and non-native plants (see *Plant Info & Images*); plant drawings, online books, management manuals, plant ID video clips, and other relevant materials.

This document was authored by Vic Ramey (UF/IFAS) and Jeff Schardt (FWC/Invasive Plant Management Section) and reviewed by environmental educators and scientists, July 2002. Revised April 2011.

SOME INVASIVE PLANTS

The plant species listed below are featured in the UF/IFAS CAIP Photo-Mural Set (SP 336)

Learn more about these and other native and non-native plants at <http://plants.ifas.ufl.edu> (See *Plant Info & Images*)

The following abbreviations refer to plant species' distribution in general regions of Florida as of Fall 2011, according to information collected by the Florida Exotic Pest Plant Council (FLEPPC).

For more information: <http://www.fleppc.org/>

N = North FL **C = Central FL** **S = South FL**



Abrus precatorius - rosary pea - Old World - C, S
Acacia auriculiformis - earleaf acacia - Australia - C, S
Albizia julibrissin - mimosa tree - Asia - N, C
Alternanthera philoxeroides - alligator weed - trop. America - N, C, S
Ardisia crenata - coral ardisia - Japan, S. Asia - N, C, S
Ardisia elliptica - shoebutton ardisia - Asia - C, S
Arundo donax - giant reed - Old World - N, C, S*
Bauhinia variegata - orchid tree - trop. Asia - C, S
Bischofia javanica - bishopwood - S, Asia - C, S
Calophyllum antillanum - santa maria - W. Indies - S
Casuarina species - Australian pine - Australia - N, C, S
Cinnamomum camphora - camphor tree - Asia - N, C, S
Cupaniopsis anacardioides - carrotwood - Australia - C, S
Cyperus involucratus - umbrella plant - Africa - C, S
Dioscorea bulbifera - air potato - trop. Asia - N, C, S
Eichhornia crassipes - water hyacinth - Brazil - N, C, S
Egeria densa - Brazilian waterweed - S. America - N, C, S*
Eugenia uniflora - Surinam cherry - S. America - C, S
Ficus microcarpa - laurel fig - Old World - C, S
Hydrilla verticillata - hydrilla - Asia - N, C, S
Hygrophila polysperma - green hygro - East Indies - N, C, S
Hymenachne amplexicaulis - West Indian marsh grass - W. Indies - N, C, S
Imperata cylindrica - cogon grass - Old World - N, C, S
Ipomoea aquatica - water spinach - East Indies - C
Jasminum dichotomum - Gold Coast jasmine - trop. Africa - C, S
Jasminum fluminense - Brazilian jasmine - trop. America - C, S
Leucaena leucocephala - lead tree - West Indies - N, C, S
Ligustrum sinense - Chinese privet - China - N, C, S
Limnophila sessiliflora - Asian marshweed - Old World tropics - N, C, S
Lonicera japonica - Japanese honeysuckle - Asia - N, C, S
Ludwigia grandiflora - largeflower primrose willow - tropical America - N, C, S*
Lygodium japonicum - Japanese climbing fern - Old World - N, C, S
Lygodium microphyllum - Old World climbing fern - Old World - C, S
Lythrum salicaria - purple loosestrife - Not yet in Florida

Macfadyena unguis-cati - cat's claw vine - trop. America - N, C, S
Melaleuca quinquenervia - melaleuca - Australia - C, S
Melia azedarach - Chinaberry - Asia - N, C, S
Mimosa pigra - catclaw mimosa - trop. America - C, S
Myriophyllum aquaticum - parrot feather - S. America - N, C, S*
Myriophyllum spicatum - Eurasian water-milfoil - Eurasia - N, C, S
Nephrolepis cordifolia - sword fern - Old World tropics - N, C, S
Neyraudia reynaudiana - Burma reed, cane grass - Old World - S
Paederia cruddasiana - sewer vine - S. Asia - S
Paederia foetida - skunk vine - Asia - N, C, S
Panicum repens - torpedo grass - S. America - N, C, S
Pennisetum purpureum - Napier grass - Africa - N, C, S
Pistia stratiotes - water lettuce - S. America - N, C, S
Psidium cattleianum - strawberry guava - Brazil - C, S
Psidium guajava - guava - trop. America - C, S
Pueraria montana var. *lobata* - kudzu - Asia - N, C, S
Ricinus communis - castor bean - Africa - N, C, S
Rhodomyrtus tomentosa - downy rose myrtle - Asia - C, S
Salvinia molesta - giant salvinia - Southern Brazil - S*
Sapium sebiferum - Chinese tallow tree - China, Japan - N, C, S
Scaevola taccada - half-flower, beach naupaka - Indian & Pacific Ocean - C, S
Schinus terebinthifolius - Brazilian-pepper - trop. America - N, C, S
Senna pendula var. *glabrata* - climbing cassia - S. America - C, S
Sesbania punicea - purple sesban, rattlebox - S. America - N, C, S
Solanum tampicense - wetland nightshade - West Indies - C, S
Solanum viarum - tropical soda apple - S. America - N, C, S
Sorghum halepense - Johnson grass - Mediterranean region - N, C, S*
Sphagneticola trilobata - wedelia - West Indies - N, C, S
Syngonium podophyllum - arrowhead vine - C. America - N, C, S
Syzygium cumini - Java plum - SE Asia - C, S
Thespesia populnea - seaside mahoe - world tropics - C, S
Tradescantia fluminensis - small-leaf spiderwort - trop. America - N, C
Urochloa mutica - Para grass - Africa - C, S
Wisteria sinensis - Chinese wisteria - China - N, C

* *Distribution designation according to the Atlas of Florida Vascular Plants* (<http://florida.plantatlas.usf.edu/>)

