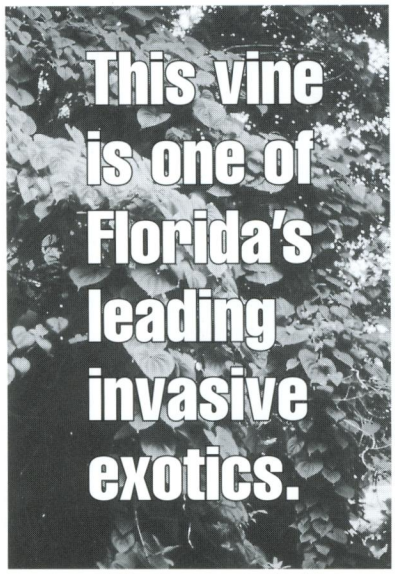
Florida EPPC 1999 Symposium Highlight

Those who attended the 1999 FLEPPC Annual Symposium in Gainesville had the opportunity to hear an outstanding presentation by ***James Argento****. James was the top student in environmental science in the 1999 Florida Junior Academy of Science Annual Competition. It was a pleasure to see the next generation, who hopefully will be working in the area of invasive plant science. Below is the abstract of James' paper. A copy of his entire paper can be obtained by contacting the IFAS Aquatic, Wetland, and Invasive Plant Information Office. – Ken Langeland*



ABSTRACT

Analysis of *D. bulbifera*, the Invasive Air Potato

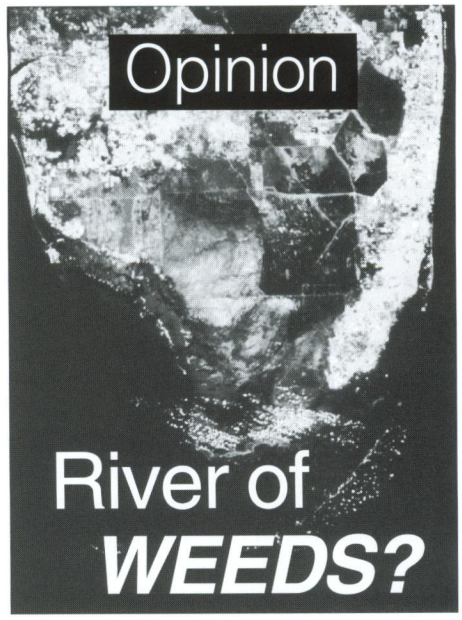
The objective of this research was to increase knowledge about why air potato, *Dioscorea bulbifera*, is so intrusive. This vine is one of Florida's leading invasive exotics. It destroys the natural balances of ecosystems by obstructing native plant growth.

A major effort is underway to halt air potato from ruining parks and forests. Individuals have tried to remove it from Sheridan Oak Forest, but to no avail. A greater understanding of why it is so intrusive will help lead to more cost efficient, time saving, and effective methods of stopping it. This information will be helpful in preventing the plant from overtaking Sheridan Oak Forest and other lands.

Air potato comes from, and is supplied energy by, a bulbil. The vine later produces new bulbils for next year's crop. In one experiment, bulbils were separated into 2 categories: 15 grams and above, and under 15 grams. After being left alone, all the bulbils in both groups grew vines. This shows that despite size, bulbils can sprout, meaning that even the smallest ones can grow vines.

In another experiment, 100 germinating bulbils were weighed and weighed again in a month. The differences and original masses were compared to see a correlation. None was visible. To statistically confirm the result, those numbers were analyzed by Regression Analysis. A C.O.R. of 0.159 resulted, meaning that there is no relation between bulbil mass and how much of the bulbil is used up during germination. Therefore, a large bulbil can stay under the soil and produce vines for a long time with out being used up quickly.

In further testing, sprouting bulbils had the area where they fell from the vine face up in one tray, and down in another. All bulbils in each tray continued to sprout, meaning that bulbils can grow vines despite which position they land. Additional endeavors featured vines being severed from bulbils. All bulbils regrew vines. In addition, all the severed vines died, displaying that they can't survive without the bulbils. This final test could be useful because maybe disconnecting the vine from the bulbil right before the vine is ready to produce new bulbils will stop it from doing so, thus controlling next year's crop.



The Everglades are in serious trouble. They face a multitude of problems including hydrologic alteration, nutrient runoff, urban encroachment, and the insidious spread of exotic pest plants. Many efforts over the past several decades have been directed at "saving" the Everglades.

The newest restoration initiative, the "South Florida Ecosystem Restoration Program" appears to finally have the political clout—hopefully the will as well—and resources to be able to do the job. Over the past two years, Vice President Al Gore, past Governor Lawton Chiles, and recently our new Governor Jeb Bush have announced plans to spend $8-10 billion to "restore" the Everglades. The vast majority of this money is to be spent on Land Acquisition and water-works. This colossal figure acknowledges the environmental failure of past governmental land-use policies in southern Florida. These earliest policies of drainage for development were concurrent with the first introductions of exotic plants - one of the stated goals of melaleuca introduction included helping dry up the swamp.

Billions of dollars are to be spent on land acquisition—most of these lands are already infested with exotic invasive plants—and billions more on water works. What will be the final outcome if the threat of exotic invasive plants is not met with resources commensurate with the threat they pose to restoration? It will be another very expensive water

management project, and result in a place where virtually every native plant and animal will be replaced by species from another part of the world.

Several recent actions have improved chances for restoration. They include: 1983 Save our Everglades initiative, the Surface Water Improvement and Management Act of 1987, the 1991 Everglades Protection Act, the Everglades Forever Act of 1994 and the Water Resources Development Act of 1996(WRDA). WRDA created the South Florida Ecosystem Restoration Task Force (SFERTF). The SFERTF is tasked with developing a comprehensive plan for the purpose of restoring, preserving, and protecting the South Florida ecosystem. The SFERTF established a working group (South Florida Ecosystem Restoration Working Group – SFERWG), to formulate, recommend, coordinate, and implement the policies, strategies, plans, programs, projects, activities, and priorities of the SFERTF. Restoration of a natural system of this magnitude and cost is unprecedented and needed an unprecedented approach.

The SFERWG has developed a working restoration plan, or sets of plans. This overall restoration concept includes exotic invasive species. In response to this serious threat, SFERWG established the Noxious Exotic Weed Task Team (NEWTT) to develop an assessment of the current status of invasive exotic plants, and a strategic plan to manage invasive exotic species. A final comprehensive control strategy is anticipated in early in 2000. Based on the Working Group's initiatives and stated concern, it is anticipated that they will ensure that this strategy is followed up with a plan for implementation and the resources to make it all happen.

Melaleuca skeletons – a testimony to successful management.

This all sounds great, and there are very positive reasons to be optimistic - we appear to be making progress in the battle against some exotic pest plants. Pre-SFERTF funding levels have allowed the National Park Service, the South Florida Water Management District and many local governments to make some headway in the battle against some exotic pest plants. Thousands of acres of melaleuca in the Conservation Areas, Big Cypress National Preserve, and Everglades National Park have been treated. The results are dramatic; visible from many roads in south Florida are acres upon acres of melaleuca skeletons, a testimony to successful management. However, many of us are concerned that the SFERTF and SFERWG may see this and feel that things are going reasonably well with exotic pest plant management and restoration.

The reality is very different. Exotic pest plants are not waiting while we get our collective assets together as the 50-year restoration plan trudges along. Old World climbing fern (*Lygodium microphyllum*) is rapidly taking over vast expanses of natural areas in south Florida. Aerial surveys of Old World climbing fern reveal a ten-fold increase in spread in only six years. Recent flights over Loxahatchee National Wildlife refuge in the Everglades reveal that many tree islands are now severely impacted by this plant - some of the tree islands may already be permanently lost. This smothering, fast growing fern spread by dust-sized wind-dispersed spores, is establishing itself everywhere. New populations have been discovered in practically every natural area in south Florida including, Lake Okeechobee, Big Cypress National Preserve, the Seminole Indian Reservation, Water Conservation Area 3A, Fakahatchee Strand State Preserve and Collier-Seminole State Park. And Old World climbing fern is one species of many.

Quietly, steadily and without fanfare another pest plant, lather leaf (*Colubrina asiatica*) is spreading across thousands

Some Everglades tree islands may be permanently lost to Old World climbing fern.

of acres of tropical hardwood hammocks in Everglades National Park and Biscayne National Park. It is decimating one of this county's rarest plant communities. Thousands of acres of Brazilian pepper (*Schinus terebinthifolius*) are replacing native vegetation in south Florida. Everglades National Park alone has over one hundred thousand acres of Brazilian pepper invading buttonwood / salt marsh prairies.

Yet no restoration funds are being allocated to address the spread of these plants. Research on the affects of these exotic plants is dramatically lacking. Several small and overmatched research programs do exist and are currently looking at the exotic plant problem in south Florida. However, the USGS the primary federal research entity has no research of any kind directly associated with this enormous problem. In May of this year, the USGS held a South Florida Science Forum in Boca Raton. The forum's goal was to highlight the USGS place-based studies program. The program's goal is to provide sound science for resource managers in critical ecosystems such as south Florida, in their words "research where it is needed most."

The symposium proceedings included 60 abstracts of studies underway in south Florida. The USGS is researching everything imaginable. You name it: sea level rise, nutrients, sheet flow, trophic dynamics, plant friction comparisons, etc. But not one USGS scientist is doing any type of research on exotic pest plants and their effects on natural areas. A few researchers are studying tree islands and how high water levels are killing trees. When asked if they are aware that hundreds of tree islands are being lost to Old World climbing fern in the Everglades and that Old World climbing fern had the capability of affecting every tree island in the entire system in the very near future. They were not.

> Exotic pest plants are not waiting while we get our collective assets together as the 50-year restoration plan trudges along.

The restoration effort has resulted in the construction of multi-million dollar water control structures. Even those developing them say they may or may not work - many of them have never been used, and some may never be used. The cost of these structures alone would be enough to bring the exotic plant problem under control in the Everglades. Yet we wait and watch while the next generation's legacy furtively disappears.

Almost everyone agrees that restoring the Everglades is worth spending billions of dollars on. However, invasive exotic plants will unquestionably spell an end to the Everglades if the threats they represent continue to be under-acknowledged and largely ignored. Restoration will be in vain if the only things in the Everglades left to save were never part of the Everglades.

We urge the SFERTF and SFERWG to respond to the immediate needs of existing control projects, and look beyond the strategic plan toward its implementation and long-term purpose of managing invasive exotic plants. -Tony Pernas and Bob Doren

Tony Pernas is the current chair of Florida EPPC and a former board member ('96-'98). Bob Doren is a founding member of EPPC, former chair ('84-'86 and '91-'93) and former board member ('86-'91 and '93-'95).