Upland Invasive Exotic Plant Management Program

Fiscal Year 2006-2007 Annual Report

Ten Years of Fighting Florida's Plant Invaders 1997-2007

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Executive Summary

Over one-and-one-half million acres of Florida's public conservation lands have been invaded by alien (exotic, nonnative, nonindigenous) plants such as melaleuca, Brazilian pepper, Australian pine, and climbing ferns. However, invasive alien plants respect no boundaries and millions of acres of private land are also affected. This ongoing alien invasion has degraded and diminished what remains of Florida's natural areas, affected agricultural production, and reduced outdoor recreation and ecotourism opportunities.

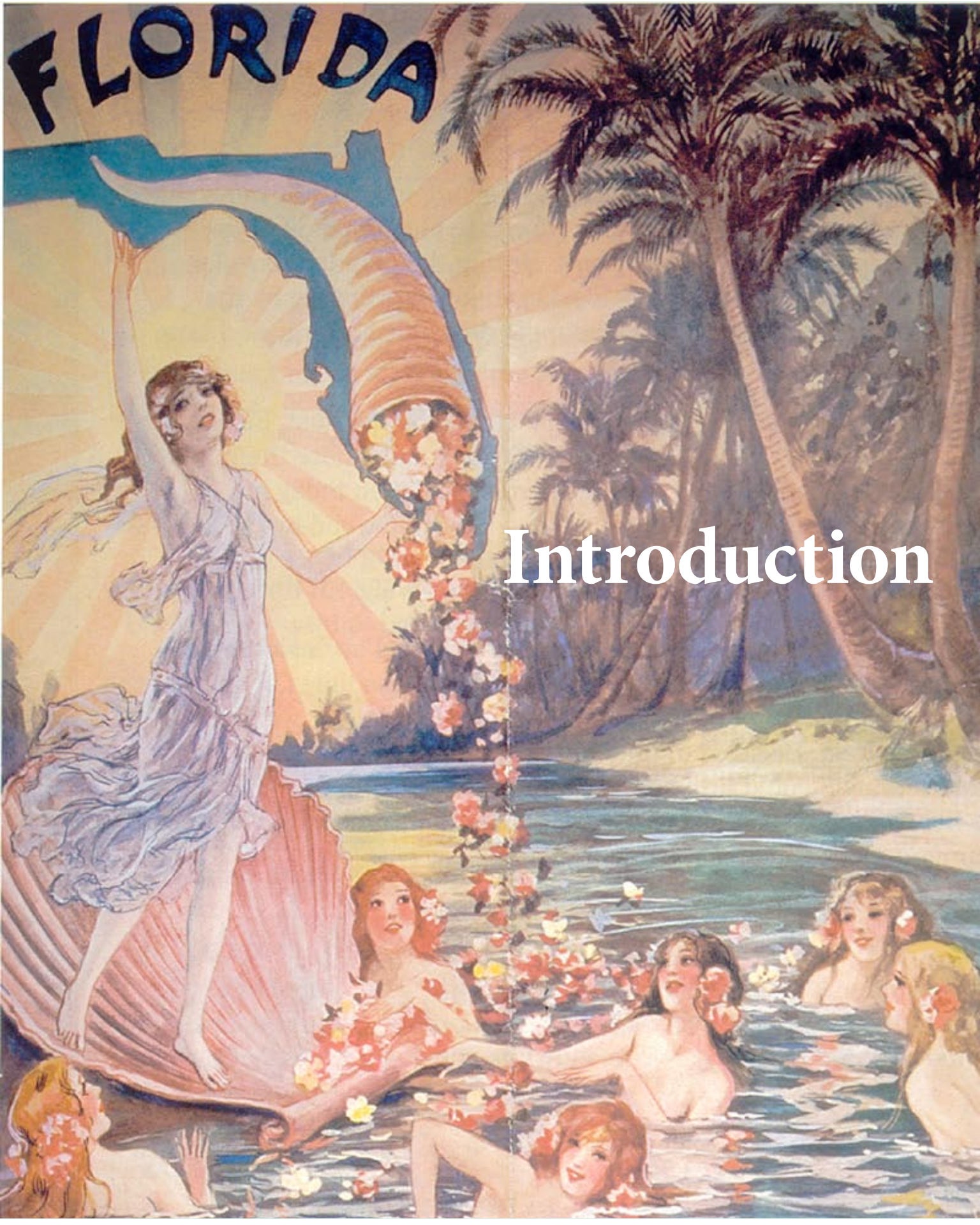
The Bureau of Invasive Plant Management (BIPM) is the designated lead agency in Florida responsible for coordinating and funding the statewide control of invasive aquatic and upland plants in public waterways and on public conservation lands. Florida's aquatic plant management program is one of the oldest invasive species control programs in the world, with its beginnings dating back to the early 1900s. With the later addition of the upland invasive plant control program, BIPM oversees the largest and most successful invasive plant management effort of its kind in the United States.

In 2007, initial control operations reached a cumulative total of 487,620 acres, or 30% of the affected area, thus exceeding the program goal of 25% control by 2010.

The Upland Invasive Exotic Plant Management Program was established in 1997 to address the need for a statewide coordinated approach to the terrestrial (vs. aquatic) invasive exotic plant problem. The "Upland Weed" Program incorporates place-based management concepts, bringing together regionally diverse interests to develop flexible, innovative strategies to address weed management issues at the local level. The Upland Weed section of the bureau funds individual exotic plant removal projects on public conservation lands statewide. Projects are considered for funding based upon recommendations from eleven Regional Invasive Plant Working Groups.

The mission of the Upland Weed Program is to achieve maintenance control of invasive exotic plants like Australian pine (*Casuarina* spp.), melaleuca (*Melaleuca quinquenervia*), Brazilian pepper (*Schinus terebinthifolius*), and Old World climbing fern (*Lygodium microphyllum*) on public conservation lands. These and over one hundred other alien plants have invaded at least 1.5 million acres of Florida's nearly 11 million acres of public conservation lands, affecting an ecotourism economy valued at $8 billion annually. Once invasive plants become established in native habitats, eradication is difficult, if not impossible to achieve; therefore, continuous maintenance of invasive nonnative plants is needed to sustain wildlife habitat and recreational opportunities while preserving native plant communities on public conservation lands.

Upland invasive weeds infested approximately fifteen percent of public conservation lands statewide in 2007. Thirty percent (487,620 acres) of the affected area is currently under maintenance control. BIPM expended $17.75 million controlling approximately 243,000 acres of upland weeds on 212 publicly managed areas during fiscal year 2007. Cooperating agencies contributed another $4.25 million in cash, time and materials, or in-kind services as a match to BIPM funding. BIPM provided herbicide to assist public land managers with maintenance control at a cost of $2.8 million for fiscal year 2007.



Introduction

Introduction

Florida's Upland Invasive Exotic Plant Management Program

When our state was first named La Florida, its profusely blooming foliage was composed of a panoply of colorful native plants. Today, exotic species comprise roughly one-third of Florida's plant life. Many of these newer botanical residents support the economically important agricultural and horticultural industries; however, there are always a few bad apples in any barrel (tropical soda apple, for one). An estimated ten percent of the thousands of non-native plants in Florida are invasive, that is, plants that pose a threat to natural systems. Invasive exotic plant species, lacking control by their native diseases and predators, spread explosively and outcompete and replace vital native species on public and private land. The resulting infestations diminish wildlife habitat, decrease recreational resources, and negatively affect the natural health and economy of the state.

With its subtropical climate, an island-like topography, and the pressures of a rapidly expanding human population, Florida is especially vulnerable to invasion by non-native (introduced, exotic, alien) species. Florida is listed along with Hawaii, California, and Louisiana as one of the states with the highest number of non-native species, both plants and animals. The South Florida region alone is home to more introduced plants than any other region within other states. Thirty years ago, a Smithsonian publication described tropical Florida as a "biological cesspool of introduced life."

Florida lies in three climatic zones, tropical, sub-tropical, and temperate, and thus possesses a wide array of natural communities. Unfortunately, invasive exotic plants have found their way into every natural habitat from coastal beach dunes (above left) to interior pine flatwoods (below left). Fortunately, the Uplands Program can control invaders wherever they are found (above and below right).

While South Florida has been hardest hit by this invasion of alien species, the problem is statewide in scope. Compounding the problems caused by this ongoing invasion is a general lack of awareness about the invasiveness of non-native species introduced into the Florida environment. Florida covers 36 million surface acres, with nearly 11 million acres in public ownership for natural resource protection. Invasive exotic plants have invaded approximately fifteen percent of these public conservation lands, affecting an ecotourism economy valued at nearly $8 billion annually. [Total tourism revenue in 2005 was over $57 billion.]

The lygodium moth, the first biological control agent for climbing ferns, was released in 2006 and 2007.

Some invaders change the composition, structure, and/or processes of native plant and animal communities. One easily observed example is when the invader forms a dense one-species stand (monoculture) where once there was a rich assembly of native species, resulting in a loss of biodiversity. A number of populations of Florida's rarest plants have been lost in this fashion. Other invaders modify habitat processes, for example, by changing water flow or by increasing fire frequency in habitats not adapted to fire. Once invasive plants become established in native habitats, eradication is difficult, if not impossible, to achieve; therefore, continuous maintenance is needed to sustain wildlife habitat and recreational opportunities while preserving native plant communities.

The melaleuca sawfly is the third biological control agent for melaleuca to be released in the Everglades.

The 1997 Legislature charged the Bureau of Invasive Plant Management (BIPM) with the task of creating a program to bring invasive exotic upland plant species under maintenance control. A maintenance control program, as defined in Section 369.22, Florida Statutes, is "a method for the control of exotic plants in which control techniques are utilized in a coordinated manner on a continuous basis in order to maintain the plant population at the lowest feasible level."

The Upland Invasive Exotic Plant Management (Uplands) Program was established that same year. To implement its statewide cooperative strategy, the Uplands Program divided the state into Regional Invasive Plant Working Groups. The Uplands Program funds individual invasive exotic plant control projects on public conservation lands based upon recommendations from these working groups. The Uplands Program melds these regional priorities into an integrated process that provides the needed support infrastructure to conduct an efficient and cost-effective statewide control program.

Funding for the Uplands Program is provided through the Invasive Plant Management Trust Fund as set forth in Section 369.252(4), F.S., which reads: "use funds in the Invasive Plant Control Trust Fund as authorized by the Legislature for carrying out activities under this section on public lands. Twenty percent of the amount credited to the Invasive Plant Control Trust Fund pursuant to Section 201.15(6), F.S., shall be used for the purpose of controlling nonnative, upland, invasive plant species on public lands." The trust fund provided nearly $18 million to fund upland weed control projects for fiscal year 2007.

Florida's Ten Most UNWANTED Invasive Plants in 2007

Plant Treated	Acres Treated	% of All Acres
melaleuca	45,449	32.4
climbing ferns	35,218	25.1
Brazilian pepper	14,278	10.2
cogon grass	3,312	2.4
Caesar's weed	1,557	1.1
soda apples	1,457	1.0
lead tree	834	0.6
Australian pines	722	0.5
coral ardisia	707	0.5
Chinese tallow	448	0.3

Florida's Top Ten Worst Plants
Based on control data provided by contractors, these ten plants (left) infested the most acres of land treated in fiscal year 2007. The list represents an unlucky 13 species: 2 *Lygodium* spp. (climbing ferns), 2 *Solanum* spp. (sodas apples), and 2 *Casuarina* spp. (Australian pines).

As stated in the DEP Agency Strategic Plan, the long-term program goal is to reduce infestations of upland invasive exotic plants on public lands by twenty-five percent by 2010, based on estimated 1995 levels of 1.5 million acres. The 2001 Upland Invasive Exotic Plant Management Program Strategic Plan set forth specific strategies to implement the program's long-term goal, including:

- Implement an integrated program that uses chemical, mechanical, and biocontrol technologies. Modify procedures as appropriate to assure the greatest protection for natural systems;
- Improve the general public's awareness of the threat to biodiversity from invasive plants by developing a comprehensive education and outreach program;
- Inventory and map with GIS the distribution of invasive exotic plant species by the year 2010; and,
- Research the use of biocontrol agents and provide procedures and facilities for their cultivation, dissemination, and evaluation including monitoring and field assessments by the year 2010.

Melaleuca and Brazilian pepper are two well known weeds in Florida, once covering more than one million acres of public conservation lands. The Florida Exotic Pest Plant Council (FLEPPC) lists 67 invasive plants found in the state as Category I pest plants and another 71 species as Category II. Category I species are those known to have damaged natural areas, while Category II species are not yet implicated in direct damage to ecosystems. Often, there may be a long lag time (years or decades) before an exotic species shows its true colors. Plants like Old World climbing fern (*Lygodium microphyllum*) and cogon grass (*Imperata cylindrica*) have expanded their range in recent years and are on the verge of overwhelming parks and forests across the state.

BIPM FY07 Uplands Project Acres and Dollars by Managing Agency

Agency	Acres	Funds
Bureau of Mine Reclamation	30	$1,214
Coastal and Aquatic Managed Areas	738	$42,525
Division of Forestry	32,032	$1,722,114
Division of Recreation & Parks	19,468	$1,937,304
Fish & Wildlife Conservation Commission	55,847	$1,652,949
Office of Greenways & Trails	20,820	$244,070
Water Management Districts[1]	27,550	$2,682,629
Department of Defense	627	$188,603
National Park Service	21,786	$932,229
US Forest Service	100	$57,614
US Fish & Wildlife Service	38,773	$4,093,252
Local government agencies	16,902	$3,736,476
TOTAL	**234,837**	**$17,334,280**

[1]Includes $1 million Melaleuca Program.

In fiscal year 2007, the Uplands Program expended over $17 million for control operations on nearly 235,000 acres. This table shows the distribution of funds to federal, state, and local agencies.

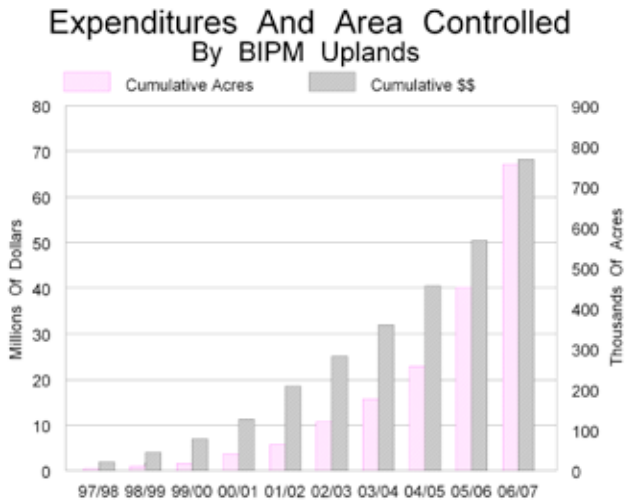
BIPM has spent over $65 million to treat invasive plants on over 750,000 acres since the inception of the Uplands Program. Cooperating agencies contributed nearly $27 million in matching funds and in-kind services towards projects funded by the program. Over its ten-year history, the program has assisted public land managers on 468 federal, state, and county managed natural areas located in 62 different counties by funding 1,141 invasive plant control operations treating 100 recognized weedy species. The Uplands Program cooperated on projects with 5 federal, 5 state, and 4 regional land managing agencies, 26 counties, 21 cities, 3 universities, and 1 community college. At least 100 projects are expected to be funded during fiscal year 2008.

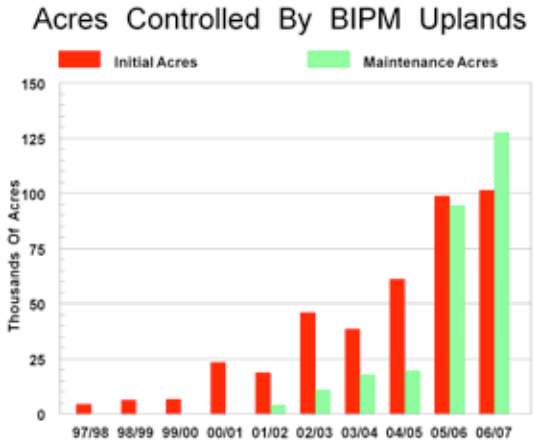
Public land managers are typically responsible for the continued maintenance control of areas originally treated with bureau funding; however, BIPM has funded a growing number of maintenance projects, particularly where the initial project covered thousands of acres. BIPM has further assisted land managers by providing herbicide for in-house maintenance control, at a cost of nearly $6 million since 2001.

BIPM directs significant staff and monetary resources into the control of invasive exotic plants on land managed by the state and other public agencies. In fiscal year 2007, the Uplands Program expended over $17 million for control operations on nearly 235,000 acres of public conservation land. The above table shows the distribution of funds to federal, state, and local agencies.

In 2007, the 10th year of Uplands Program, the total for initial control operations reached 487,620 acres, or 30% of the affected area. This exceeded the program goal of 25% to be reached by 2010. The Uplands Program has clearly met the need for a comprehensive plan that incorporates broad and consistent strategies, reduces agency inconsistencies, and takes into account differing agency mandates to achieve the goal of controlling invasive plant species in Florida. The program is not only applicable to and coordinated with state and federal efforts to manage invasive species, but has also been used as a model by other states and countries. Also in 2007, the Uplands Program was recognized by the U. S. Department of the Interior with its Cooperative Conservation Award.

Invasion by non-native plants is one problem that *can* be solved by "throwing a lot of money at it." As funding increases, more contractors can be hired, more herbicide purchased, and more acres treated. There must be a limit to this relationship, but it has yet to be reached by the Uplands Program.





The Uplands Program began as and remains an initial treatment operation. However, as the number of acres treated has grown substantially over the years, attention has been given to assisting land managers with large scale maintenance needs. Re-treatment costs can be significant, with some projects costing as much as $200,000.

Florida's Top Ten Worst Plants, Ever!

Each year, the amount of a specific species treated will vary. Based on control data, the ten plants at right have had the largest cumulative impact over the ten-year history of the Uplands Program (see table on p. 7 for comparison). Climbing ferns (*Lygodium* spp.), unlike melaleuca and Brazilian pepper, affect the entire state (and beyond). This invader has the potential to surpass all other species in its negative effect on Florida's environment.

Statewide Acres Treated 1997-2007		
Plant Treated	Acres Controlled	% of Total Treated Acres
melaleuca	209,161	46.6%
Brazilian pepper	70,146	15.6%
climbing ferns	54,936	12.3%
cogon grass	6,678	1.5%
Australian pines	5,989	1.3%
Chinese tallow	5,130	1.1%
Caesar's weed	4,660	1.0%
tropical soda apple	4,336	1.0%
air-potato	2,642	0.6%
coral ardisia	2,542	0.6%

Cooperative Weed Management Areas

An Old Idea = A New Approach in Florida

Cooperative Weed Management Areas (CWMAs) are local organizations that provide a mechanism for sharing invasive plant management resources across jurisdictional boundaries in order to achieve widespread invasive plant prevention and control in a broader geographic region. CWMAs have been common for years in the Western USA, where landowners and managers decided that a new approach was needed to collectively combat common invasive plant problems. Invasive species respect no boundaries, so managers had to learn how to work "across the fence" on both private and public lands. Even the most diligent, intensive control efforts of one land manager won't be successful in the long run, if invasive plants can re-infest the area from a neighboring property. So local citizens, landowners, and non-profit groups joined together with city, county, state, tribal, and federal officials under the common goal of managing invasive plants within a defined area. [Additional information about CWMAs in the West is available from the Center for Invasive Plant Management: www.weedcenter.org/weed_mgmt_areas/wma_overview.html]

Eastern states share many of the same types of invasive plant problems that are encountered in the West, although in the East there are some unique challenges. Western states have vast areas of land owned by the federal government, whereas in the East there are fewer federal holdings. In the East, land also tends to be divided into multiple smaller ownerships, unlike in the West where single owners often own large tracts of land. Another difference in the East is the much higher density of human population than most Western states have. Of particular significance—counties in Western states often have County Weed Supervisors who are active in local invasive plant control and help create and enforce county weed laws. In the East, very few counties have employees who are solely dedicated to invasive plant management and oversight, nor sufficient state or municipal weed laws to empower them.

So how could the CWMA idea help Florida? In general, CWMAs address many concerns, including prevention, education/awareness, early detection and rapid response, monitoring of existing species and success of management, and integrated pest management plans. A CWMA allows managers to expand efforts across the landscape, rather than being limited to a political or property boundary. By combining knowledge and experience, participants are able to develop, adopt, and utilize Best Management Practices, thus reducing risks and improving the results of control efforts. Most importantly, the CWMA public-private partnership can be used to secure, share, and coordinate outside funding, thereby reducing individual management costs.

All CWMAs share five basic characteristics. These are (1) a defined geographic area, (2) the involvement or representation of the majority of landowners and natural resource managers in that defined area, (3) a formal steering committee, (4) a written commitment to cooperation (MOU/MOA), and (5) a comprehensive weed management plan. CWMAs may use different approaches and have different projects, but they all benefit from the formal partnership structure. A "CWMA Cookbook" and many other valuable resources for forming a CWMA in Florida, or anywhere in the East, can be obtained from the Midwest Invasive Plant Network (www.mipn.org/cwma.html).

At present, there are several CWMAs operating or forming in Florida. These include the Marion County Invasive Species Management Council, the Florida Keys Invasive Exotic Task Force, and—the first and largest—Everglades Cooperative Invasive Species Management Area, which includes management plans for both invasive plants and animals (*see* www.evergladescisma.org/ *for more information*).

Methods of Invasive Plant Control

Herbicides, biological controls, manual (hand-pulling), mechanical, and physical controls are used separately or in combination to slow the spread of invasive plants. Herbicides are pesticides designed to kill plants. They are a vital component of most control programs and are used extensively for invasive exotic plant management in Florida. Herbicides are target-specific and are much safer in use than pesticides intended for insects or other animals. Herbicide application methods include:

Foliar. Herbicide is applied to the plant with aerial or ground based equipment. Foliar applications can be either directed or broadcast. Broadcast applications are used when damage to non-target vegetation is a minimal concern or when a selective herbicide is used.

Basal bark. Herbicide is applied directly to the bark around the circumference of the tree up to fifteen inches above the ground. The herbicide is absorbed through the bark.

Girdle (or "hack-and-squirt"). Cuts are made into the cambium around the circumference of the tree. Herbicide is then applied to each cut.

Cut stump. After cutting and removing large trees or brush, herbicide is sprayed or painted onto the cut surface. The herbicide is usually concentrated on the cambium layer on large stumps.

basal bark application

girdle treatment

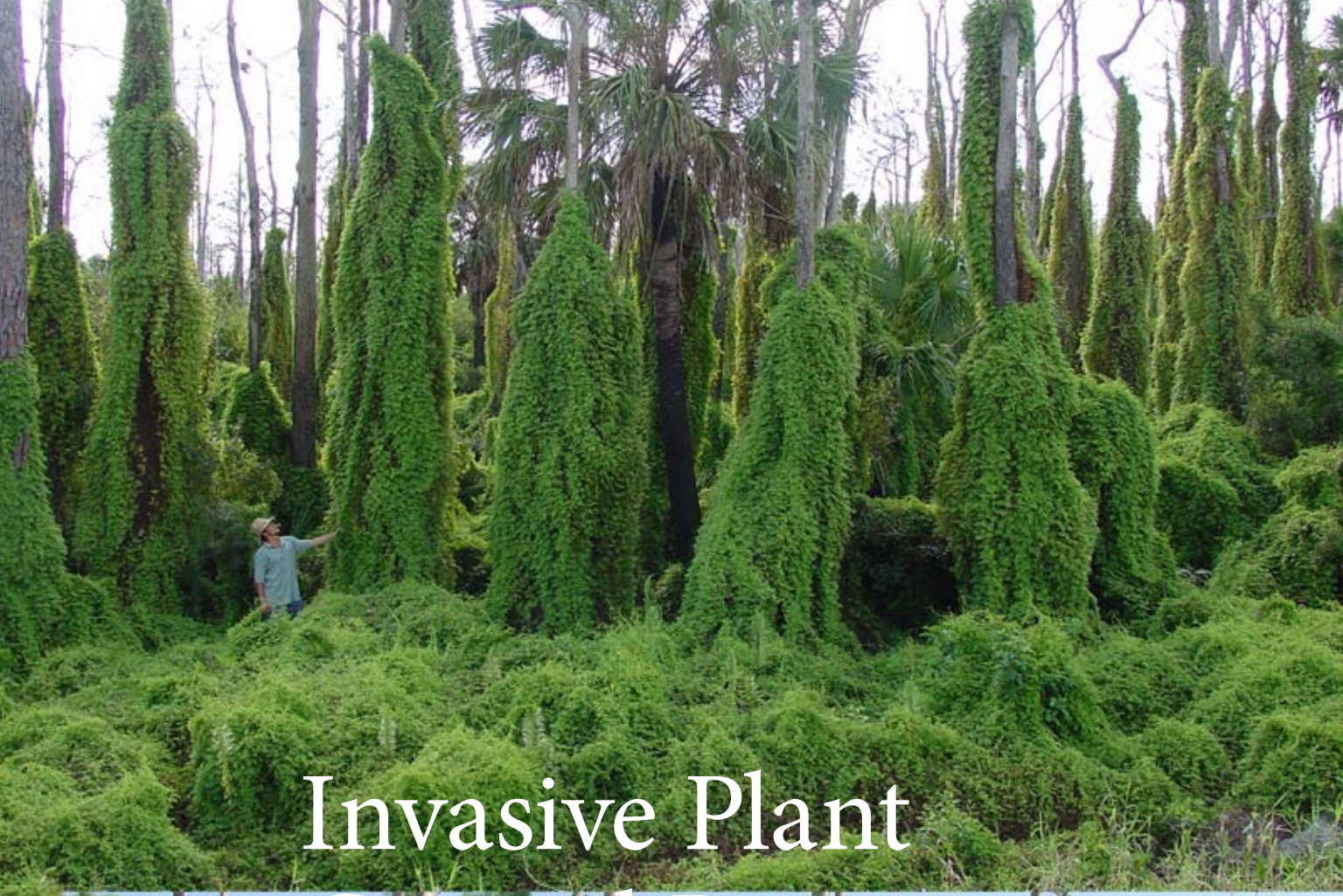
Brontosaurus mower

melaleuca weevil

Mechanical removal involves the use of a bulldozer, Brontosaurus mower, Hydroaxe, or other specialized logging equipment to remove woody plants. Intense follow up with other control methods is essential after the use of heavy equipment because disturbance of the soil creates favorable conditions for regrowth from seeds and root fragments, and re-colonization by other invasive non-native plants. Mechanical removal may not be appropriate in natural areas because of disturbance to soils and non-target vegetation. However, it is the only effective way to quickly remove dense monocultures of species such as Brazilian pepper and Australian pine.

Many plants are prevented from becoming serious weeds in their native range by a complex assortment of diseases, insects, and other herbivorous organisms. When a plant is brought into a new environment with favorable growing conditions, the absence of these regulating species may allow non-native plants to become serious weeds. "Classical" biological control seeks to locate insects from a plant's native range and import host-specific species to attack and control the plant in regions where it has become a weed. This approach has a proven safety record and has been effective in controlling a number of weeds around the world.

Prescribed burning and water level manipulation are cultural practices that are used in management of pastures, rangeland, and commercial forests, and, in some situations, may be appropriate for vegetation management on natural areas. Some species, such as melaleuca and cogon grass, respond positively to fire, so prescribed burning, if used, must be coupled with another control method.



Invasive Plant Control Projects

Invasive Plant Control Projects

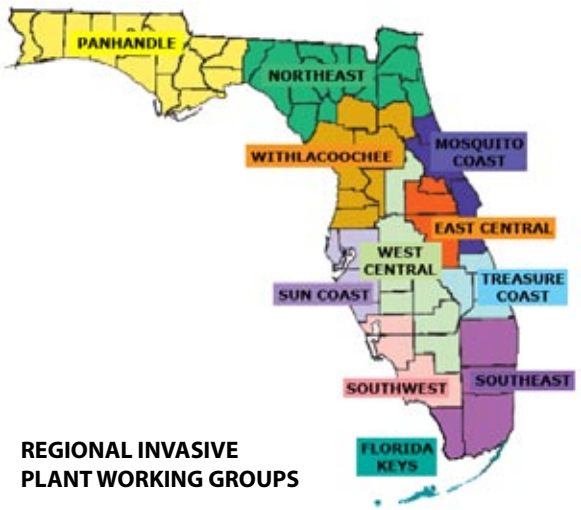
Upland Invasive Exotic Plant Control Projects

Fiscal Year 2006-2007

The Regional Invasive Plant Working Group brings together stakeholders in a geographic area for the purpose of combining expertise, energy, and resources to deal with common weed problems. The Bureau relies on the local knowledge within each working group to set regional control priorities based upon severity and potential threat to existing public conservation lands. The working group reviews and ranks proposals from land managers for state-funded control operations. The ranked lists of projects then form the basis for the state program's annual work plan.

The eleven working groups are made up of over 500 members representing federal, state, and local government public conservation land managers, non-governmental organizations, and private landowners across the state. Program liaisons have been designated for each working group to facilitate proposal review and coordination with the state program staff.

The following sections report on projects completed this year and are arranged alphabetically by Working Group (EC-WR). Each report references the public conservation land where the work occurred, a file tracking number, the size of the project area, and total Bureau funds expended. When funding from another agency was provided, the amount is noted in the body of the report. Most projects are solely funded by the Bureau. Control data are derived from daily progress reports submitted by the contractor performing the work. The type of control is agreed upon by the site manager, contractor, and program staff before work begins.



The Bureau divided the state into eleven Regional Invasive Plant Working Groups, which generally follow watershed boundaries. Projects pass through the working groups for review and ranking before being accepted by the Bureau.

Each project description also contains a table indicating the species of plant treated, a species rank, the type of control method used, and the herbicides used. In this table, "rank" refers to the designation as a Category I or Category II invasive species by the Florida Exotic Pest Plant Council (see www.fleppc.org for more information).

"Herbicide" indicates the type of chemical used (see below for abbreviations used). Contractors use various mixtures, depending upon factors such as site/soil conditions, plant densities, proximity to water bodies, or personal experience. When two herbicides are mixed together this is indicated with a "+" symbol; e.g., "GLY+MET." When two different herbicide mixes are used to control the same plant on a project, for example Garlon 4 (triclopyr) is used in one area and Rodeo (glyphosate) is used in another, this is indicated with a "/" symbol; e.g., "TRIE/GLY." There is no one "right" mix for any plant under all conditions. The mention of a brand or trade name is not an endorsement for that product.

ABBREVIATIONS

PCL:	public conservation land
TYPE (METHOD) OF CONTROL:	
BB	basal bark
CS	cut stump
FL	foliar
HS	frill and girdle (or "hack-and-squirt")
PC	poodle cut (foliar, vines only)
AR	aerial broadcast by helicopter
MC	mechanical
HERBICIDES:	
GLY	glyphosate (e.g., Roundup)
TRIE	triclopyr ester (e.g., Garlon 4)
TRIA	triclopyr amine (e.g., Tahoe 3A)
IMZ	imazapyr (e.g., Arsenal)
IMP	imazapic (e.g., Plateau)
MET	metsulfuron-methyl (e.g., Escort)
24D	2,4-D amine

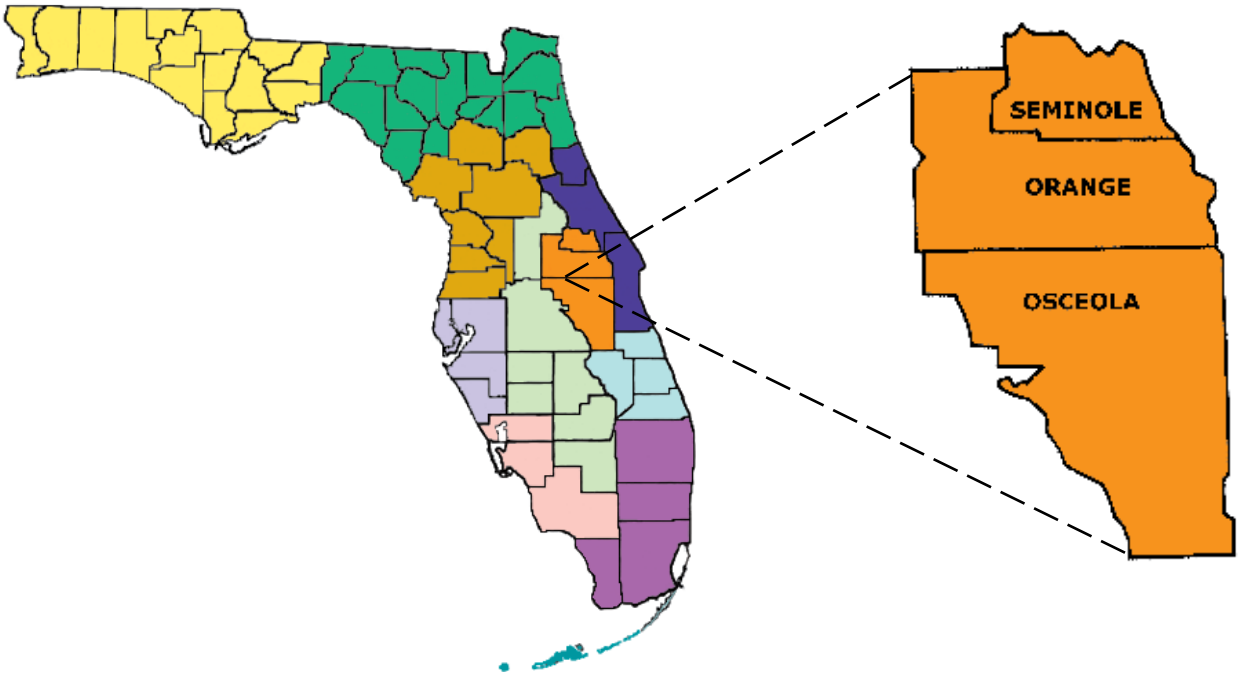
Most contractual work is performed by ground crews. A typical crew consists of one supervisor and eight workers.

Herbicide is mixed on site and poured into backpack sprayers that workers will use for a basal bark or cut stump application.

When a thick monoculture dominates a site, mechanical control with heavy equipment becomes a cost-effective alternative to using ground crews.

Some counties have their own invasive plant control program. BIPM works directly with these county programs, rather than going through a private contractor.

East Central Working Group Projects



Wekiwa Springs State Park

County: Lake, Orange, Seminole
PCL Size: 7,737 acres

Project ID: EC-050	490 acres	$19,138.20
Project ID: EC-053	40 acres	$9,291.60

Project Manager: Florida Park Service (DEP)
Rick Owen, Park Biologist
1800 Wekiwa Circle, Apopka, Florida 32712
Phone: 407-884-2006, Fax: 407-884-2039
E-mail: richard.owen@dep.state.fl.us

Scratchthroat (*Ardisia crenata*), also known as coral ardisia, is a serious threat to natural systems in central and north Florida. The first project (EC-050) targeted two significant sites of coral ardisia infestation within Wekiwa Springs State Park. One site encompasses upland areas adjacent to and surrounding Wekiwa Spring and its associated spring run (Wekiwa Hammock). Wekiwa Hammock comprises five management zones that total approximately 385 acres. The other infested area was the hammocks surrounding Sulphur Spring and its associated spring run (Sulphur Hammock). Sulphur Hammock consists of two management zones that total approximately 105 acres.

Natural communities in the two hammock systems include sandhill, scrub, mesic and wet flatwoods, and hydric hammock. The two hammock systems are a significant source of the exotic plants invading the Wekiva River Basin. Coral ardisia occurred primarily along the hydric/upland community ecotone.

The second project (EC-053) targeted the McCall tract, a 40-acre parcel located on the southwest boundary of Wekiwa Springs State Park. Natural communities found on the McCall tract include an overgrown but still intact sandhill, mesic flatwoods, a small disturbed isolated wetland, and two ephemeral blackwater stream that enter the property via two distinct drainages. These streams converge and discharge into Lake Prevatt, and Outstanding Florida Water. Over ninety-five percent of the lake lies within Wekiwa Springs State Park. The offsite drainage basins of these two streams are the primary conduit for continued exotic seed dispersal into park property. This project continued maintenance control on the McCall tract.

Species Treated	**Common Name**	**Rank**	**Type**	**Herbicide**
Ardisia crenata	coral ardisia	I	BB	TRIE
Cinnamomum camphora	camphor tree	I	CS	TRIE
Dioscorea bulbifera	air-potato	I	FL	GLY+MET
Nephrolepis spp.	sword fern	I	FL	TRIA/TRIE
Triadica sebifera	Chinese tallow	I	CS	TRIE
Xanthosoma sagittifolium	elephant ear	II	FL	GLY+TRIA
Urena lobata	Caesar's weed	II	FL	GLY

Wekiwa Springs

Top left: Contractors scope out the extent of the problem before bidding on the job.

Top right: Wreathed with air-potato vines (*Dioscorea bulbifera*), this creek could soon disappear from sight.

Bottom: Project map for McCall Tract maintenance.

McCall Tract (WS47) Site Plan for Wekiwa Springs State Park
2006 Exotic Grant Proposal

500 0 500 Feet

Triple N Ranch Wildlife Management Area

County: Osceola
PCL Size: 15,391 acres
Project ID: EC-055 59 acres $26,690

Project Manager: Fish & Wildlife Conservation Commission
Jeremy Olson, Biological Scientist III
5285 N Kenansville Road, St. Cloud, Florida 34773
Phone: 407-498-0991, Fax: 407-498-0994
E-mail: jeremy.olson@myfwc.com

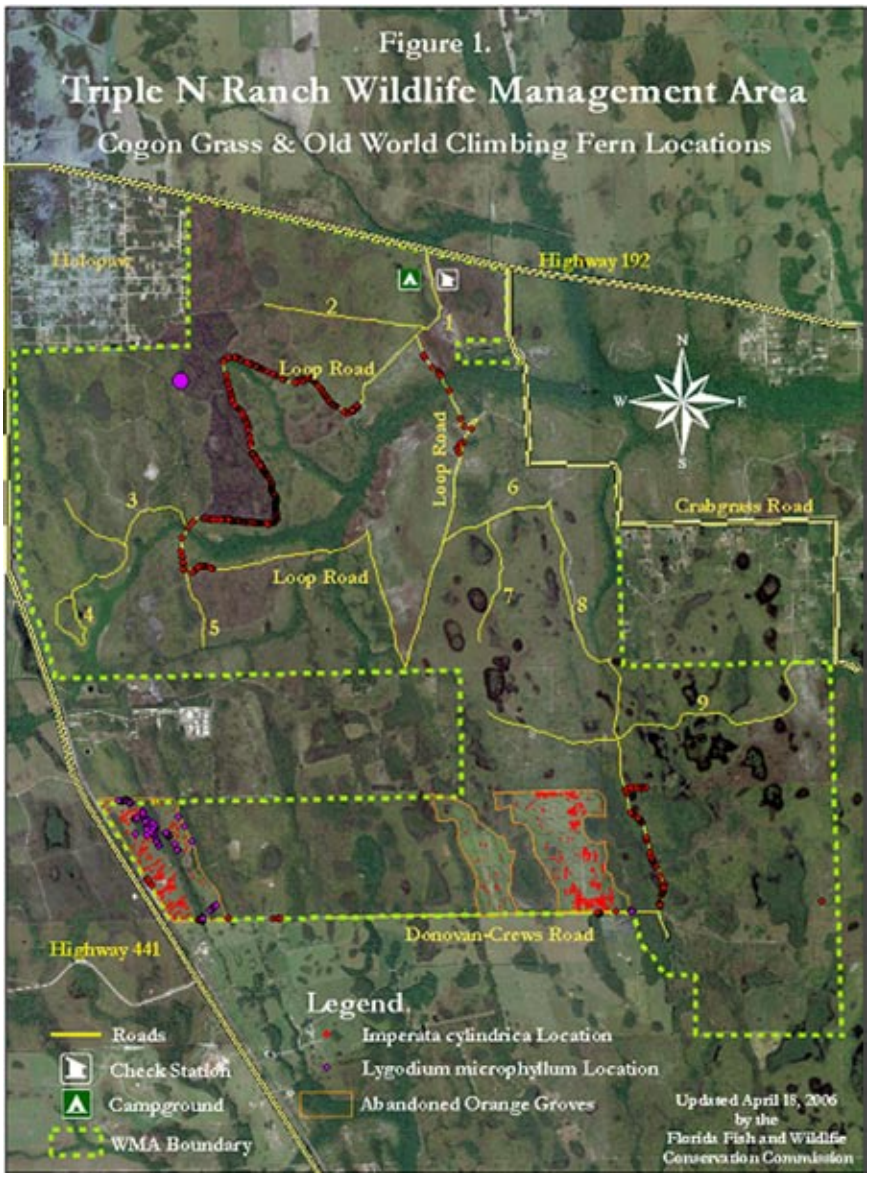
The Triple N Ranch WMA contains nearly 9,000 acres of mesic pine flatwoods and over 2,000 acres of contiguous cypress swamp, as well as nearly 700 acres of the globally imperiled dry prairie natural community. Other natural communities include wet prairie, depression marsh, xeric oak scrub, hardwood swamp, hardwood hammock, and hydric hammock. Fourteen rare plant species are known or suspected to occur on the WMA, including short-leaved rosemary (*Conradina brevifolia*) and wild coco (*Pteroglossaspis ecristata*).

Old World climbing fern occurred in irrigation ditches associated with an operating orange grove located on the property, and had begun to invade nearby cypress swamps. An additional infestation of approximately four acres occurred in another cypress dome located on the northern portion of the property. BIPM funded initial control on the majority of the area containing climbing fern in 2003. In total, climbing fern was limited to 14 acres of irrigation ditches and cypress swamp.

Cogon grass infested approximately 41 acres of an abandoned orange grove in patches ranging from ten square feet to over one acre. Cogon grass also infested approximately four acres along roadsides on recently improved roads. Staff burned or mowed much of the cogon grass during spring 2006 to increase the effectiveness of the herbicide treatment. Another 50 acres of maintenance control was conducted by staff with chemicals from the Herbicide Bank.

Species Treated	Common Name	Rank	Type	Herbicide
Imperata cylindrica	cogon grass	I	FL	GLY+IMZ
Lygodium microphyllum	Old World climbing fern	I	FL	GLY±IMZ

Triple N Ranch



Little Big Econ State Forest

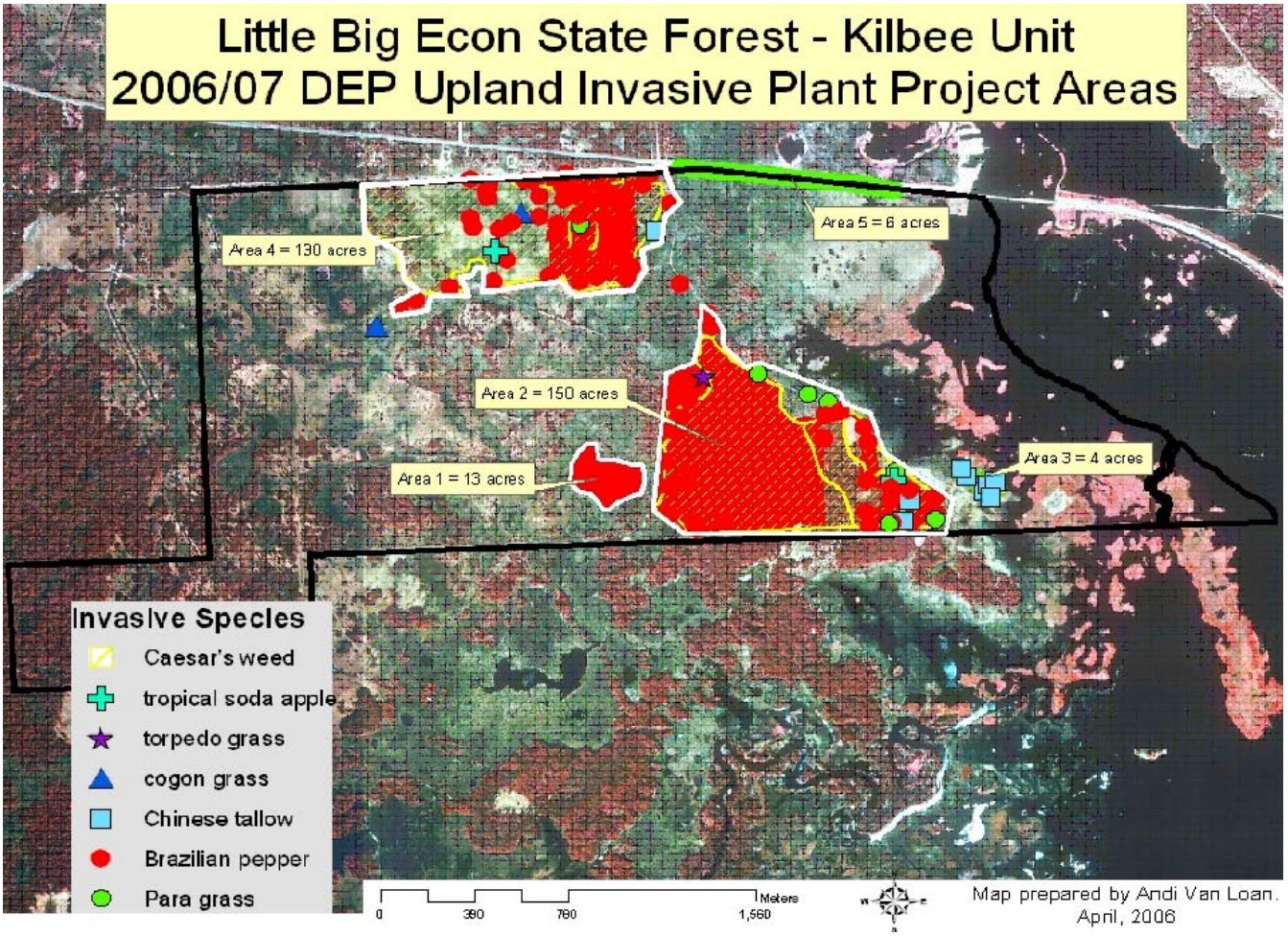
County: Seminole
PCL Size: 5,049 acres
Project ID: EC-048 303 acres $32,405.19

Project Manager: Division of Forestry
Paul Hartsfield, Forest Area Supervisor
1350 Snowhill Road, Geneva, Florida 32732
Phone: 407-971-3502, Fax: 407-971-3504
E-mail: hartsfp@doacs.state.fl.us

The predominant habitat on the Kilbee Unit is river floodplain marsh associated with the St. Johns River. The river floodplain is often dry or moist most of the year, with flooding only occurring once a year, if at all, during the wet season. This community type is composed of scattered cabbage palms (*Sabal palmetto*), wax myrtle (*Myrica cerifa*), groundsel tree (*Baccharis halimifolia*), sand cordgrass (*Spartina bakeri*), and numerous salt marsh plant species including saltmeadow cordgrass (*Spartina patens*), sea oxeye (*Borrichia frutescens*), perennial glasswort (*Salicornia perennis*), and Christmasberry (*Lycium carolinianum*). This community is unique due to the fact that it has salt marsh plant species in such an inland location. In the southeast corner of the Kilbee Unit, the Econlockhatchee (Econ) River empties into the St. Johns River. The Econ River is listed as an Outstanding Florida Waterway (OFW).

The project area was divided into five treatment areas within the 1,646-acre Kilbee Unit of the Forest. Area 1 was a 13-acre infestation of Brazilian pepper located in the south central portion of the unit. Scattered Brazilian pepper plants occurred at low density (1-5%) across the area. Area 2 was a 150-acre area on the east side of the southern boundary of the unit that was mostly covered with a low density of mixed Brazilian pepper and Caesar's weed. Small individual spots of Pará grass and Chinese tallow with moderate to heavy (26-95%) coverages were also found in this area. Area 3 was a 4-acre infestation of dense (96-100%) Pará grass. Area 4 was a 130-acre area located in the northern part of the unit with a low density infestation of Caesar's weed over most of the area. Brazilian pepper along the north boundary of this area grew in ditched areas that are wet throughout much of the year. Area 5 was a dense linear infestation of approximately six acres of Pará grass located in the marshy area on the north boundary of the unit. The DOF Forest Health Section provided $20,000 in matching funds for this project.

Species Treated	Common Name	Rank	Type	Herbicide
Schinus terebinthifolius	Brazilian pepper	I	BB	TRIE
Triadica sebifera	Chinese tallow	I	BB	TRIE
Urochloa mutica	Pará grass	I	FL	GLY+IMZ
Urena lobata	Caesar's weed	II	FL	GLY+TRIA


Little Big Econ State Forest - Kilbee Unit
2006/07 DEP Upland Invasive Plant Project Areas
Area 4 = 130 acres
Area 5 = 6 acres
Area 2 = 150 acres
Area 1 = 13 acres
Area 3 = 4 acres
Invasive Species
Caesar's weed
tropical soda apple
torpedo grass
cogon grass
Chinese tallow
Brazilian pepper
Para grass
0
390
780
1,560
Meters
Map prepared by Andi Van Loan.
April, 2006

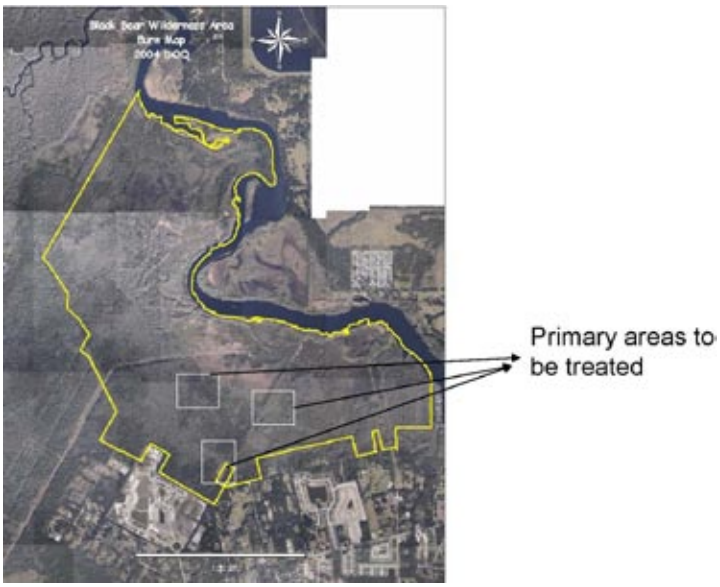
Black Bear Wilderness Area

County: Seminole
PCL Size: 1,100 acres
Project ID: EC-049 50 acres $32,200

Project Manager: Seminole County Natural Lands Program
Jim Duby, Principal Coordinator
3485 N CR 426, Geneva, Florida 32732
Phone: 407-349-0959, Fax: 407-349-9551
E-mail: jduby@seminolecountyfl.gov

The Black Bear Wilderness Area creates the northwest border of Seminole County and abuts the St. Johns River. Black Bear Wilderness Area is located in the Wekiva River Protection Area, a state protection area that protects the Wekiva River's watershed. Black Bear Wilderness Area contains a variety of rare plants and animals. Natural communities include hydric hammock, wet prairie, freshwater marsh, upland mixed forest, cypress swamp, and mixed hardwood swamp. The project area targets the south and central portions of the Black Bear Wilderness Area.

Species Treated	Common Name	Rank	Type	Herbicide
Ardisia crenata	coral ardisia	I	BB	TRIE
Dioscorea bulbifera	air-potato	I	FL	GLY+MET
Cinnamomum camphora	camphor tree	I	BB	TRIE
Colocasia esculenta	wild taro	I	FL	GLY
Albizia julibrissin	mimosa	I	CS	TRIE
Triadica sebifera	Chinese tallow	I	BB	TRIE
Melia azedarach	Chinaberry	II	CS	TRIE
Urena lobata	Caesar's weed	II	FL	GLY±MET



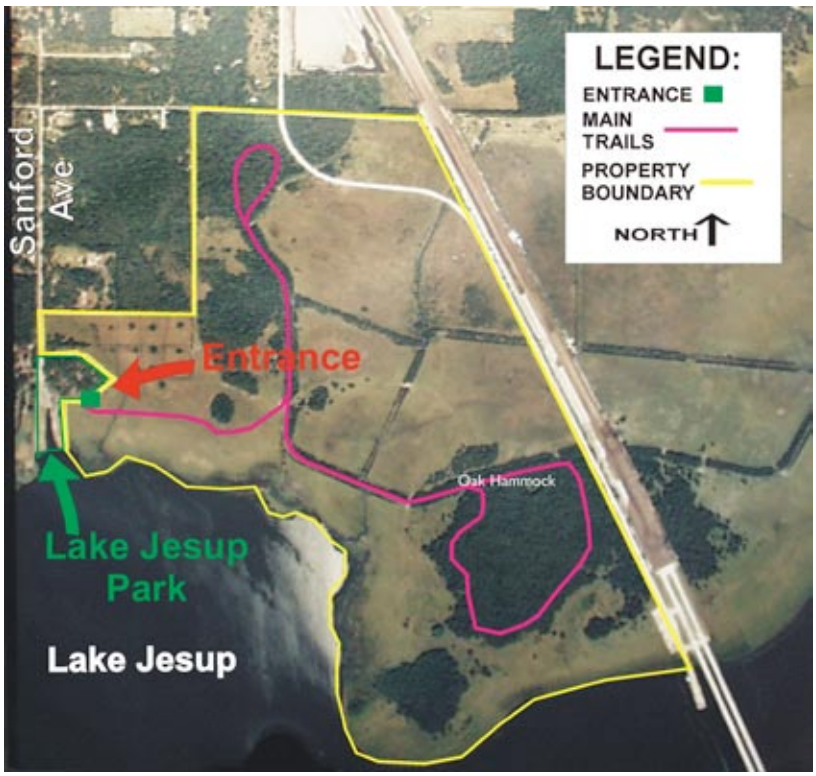
Lake Jesup Wilderness Area

County: Seminole
PCL Size: 475 acres
Project ID: EC-052 120 acres $45,426

Project Manager: Seminole County Natural Lands Program
Jim Duby, Principal Coordinator
1101 East First Street, Sanford, Florida 32771-1468
Phone: 407-665-7466, Fax: 407-665-7367
E-mail: jduby@seminolecountyfl.gov

The Lake Jesup Wilderness Area is located approximately four miles south of the City of Sanford on the north shore of Lake Jesup. Adjacent conservation land includes Spring Hammock Preserve and the Lake Jesup Conservation Area. The preserve consists mostly of shallow marsh and wet prairie, with isolated islands of hydric hammock. Mitigation work began in early April 2003, consisting of filling manmade ditches and breaching dikes to enhance the natural function of the habitats on site. Exotic plant coverage of the project area was approximately sixty percent.

Species Treated	Common Name	Rank	Type	Herbicide
Lantana camara	lantana	I	BB	TRIE
Paederia foetida	skunk vine	I	FL	GLY
Schinus terebinthifolius	Brazilian pepper	I	BB	TRIE
Solanum viarum	tropical soda apple	I	BB	TRIE



Spring Hammock Preserve

County: Seminole
PCL Size: 1,500 acres
Project ID: EC-054 110 acres $26,585

Project Manager: Seminole County Natural Lands Program
Jim Duby, Principal Coordinator
1101 East First Street, Sanford, Florida 32771-1468
Phone: 407-665-7466, Fax: 407-665-7367
E-mail: jduby@seminolecountyfl.gov

Spring Hammock Preserve is located on the western shore of Lake Jesup. The Preserve encompasses much of the watershed for Soldier Creek, an important tributary to Lake Jesup. The Preserve possesses two threatened natural communities, sandhill and scrub. The Preserve also contains a variety of rare plants, including Florida willow, pygmy fringe tree, royal fern, cuplet fern, and needle palm.

Property acquisition of the Spring Hammock Preserve began in 1927 with the donation of Big Tree Park to Seminole County. Adjacent conservation lands include the Lake Jesup Wilderness Area and the Lake Jesup Conservation Area.

Species Treated	Common Name	Rank	Type	Herbicide
Colocasia esculenta	wild taro	I	FL	TRIA
Dioscorea bulbifera	air-potato	I	FL	GLY+TRIA+MET
Lygodium japonicum	Japanese climbing fern	I	FL	GLY+TRIA
Nephrolepis cordifolia	sword fern	I	FL	TRIA
Tradescantia fluminensis	tradescantia	I	FL	GLY
Melia azedarach	Chinaberry	II	CS	TRIE

A carpet of tradescantia smothers the ground layer, threatening rare plants such as...

...the state endangered cuplet fern (*Dennstaedtia bipinnata*).

Lake Lotus Park

County: Seminole
PCL Size: 125 acres
Project ID: EC-056 3 acres $16,180

Project Manager: The City of Altamonte Springs
Cindy J. Falk, Park Ranger
1153 Lake Lotus Park Road, Altamonte Springs, Florida 32714
Phone/Fax: 407-293-8885
E-mail: cjfalk@altamonte.org

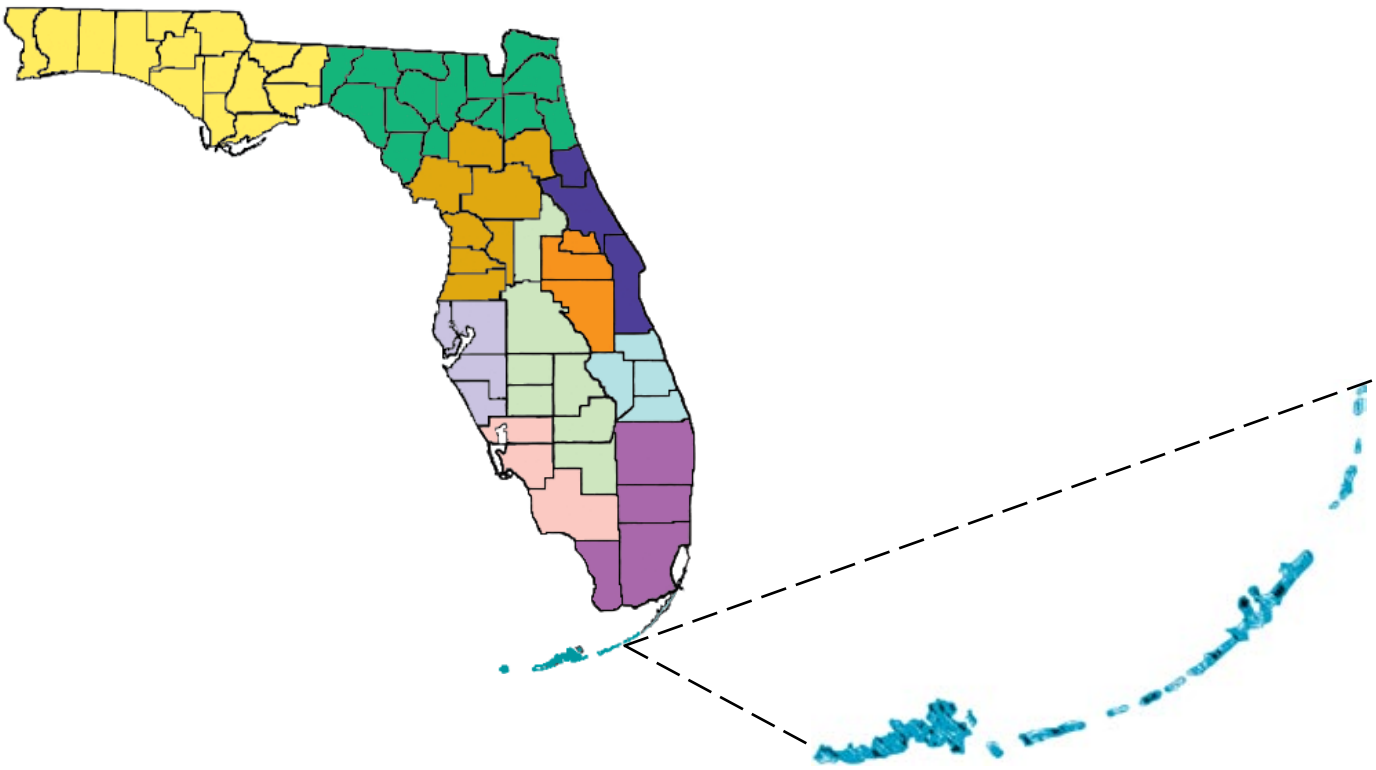
Lake Lotus Park lies along the banks of the Little Wekiva River and on the southern shore of Lake Lotus. The park also contains a section of the Little Wekiva River, which is a tributary of the Wekiva River, an Outstanding Florida Water. The river area is within a Riparian Habitat Protection Zone. This nature park is managed for low impact recreation, with 89.35 acres being a conservation easement and 25 acres on the east side of the Little Wekiva River not open to public use.

Lake Lotus Park encompasses natural habitat ranging from pine scrub to floodplain wetlands. Listed species in or near the treatment area include cardinal flower (*Lobelia cardinalis*), royal fern (*Osmunda regalis*), and Florida flame azalea (*Rhododendrum austrinum*). This project targeted an area along the Little Wekiva River on the east side of the park with ninety percent coverage of invasive plants. Park staff conducted maintenance control on an additional 22 acres, with chemicals provided by the Herbicide Bank.

Species Treated	Common Name	Rank	Type	Herbicide
Dioscorea bulbifera	air-potato	I	FL	TRIA
Paederia foetida	skunk vine	I	FL	GLY
Panicum maximum	Guinea grass	II	FL	GLY
Sphagneticola trilobata	wedelia	II	FL	GLY

Skunk vine (left) and Guinea grass (below) are a growing problem in central Florida conservation areas. But proper and timely treatment can stop any weed in its tracks (right).

Florida Keys Working Group Projects



State Parks in the Florida Keys

County: Monroe

John Pennekamp Coral Reef	PCL Size:	63,644 acres
Key Largo Hammocks	PCL Size:	2,421 acres
Lignumvitae Key Botanical	PCL Size:	10,659 acres
Windley Key Geologic	PCL Size:	32 acres
Indian Key Historic	PCL Size:	111 acres
Long Key	PCL Size:	980 acres
Curry Hammock	PCL Size:	970 acres
Project ID: FK-068	300 acres	$120,858

Project Manager: Florida Park Service (DEP)
Pat Wells, Park Manager
P.O. Box 487, Key Largo, Florida 33037
Phone: 305-451-1202, Fax: 305-853-3555
E-mail: pat.wells@dep.state.fl.us

Public conservation land protects a significant area of the Florida Keys. State Parks in the Florida Keys include Dagny R. Johnson Key Largo Hammocks, John Pennekamp Coral Reef, Lignumvitae Key Botanical, Windley Key Geologic, Indian Key Historic, Long Key, and Curry Hammock. The native vegetation of the Keys derives primarily from West Indian and Caribbean origin. Natural communities within the state parks include tropical hardwood hammock, pine rocklands, freshwater wetlands, and mangrove swamp. These lands are home to a number of rare endemic plants, such as the endangered Keys' indigo (*Indigofera keyensis*) and wild cotton (*Gossypium hirsutum*).

This project funded the employment of four exotic plant control technicians for the Keys state parks during the 2007 fiscal year. These exotic plant control technicians were OPS employees of the Florida Park Service who provided initial treatment and additional re-treatment of state park lands in the Keys. The technicians also conducted quarterly maintenance treatments. FPS provided matching costs for herbicide, vehicles, and crew equipment with a total value of $21,000. BIPM also provided herbicide for this project through its Herbicide Bank

Species Treated	**Common Name**	**Rank**	**Type**	**Herbicide**
Casuarina equisetifolia	Australian pine	I	BB	TRIE
Colubrina asiatica	lather leaf	I	CS	TRIA
Manilkara zapota	sapodilla	I	CS	TRIA
Neyraudia reynaudiana	Burma reed	I	FL	GLY
Scaevola sericea	beach naupaka	I	BB	TRIE
Schinus terebinthifolius	Brazilian pepper	I	CS	TRIE
Thespesia populnea	portia	I	CS	TRIA
Leucaena leucocephala	lead tree	II	CS	TRIE
Sansevieria hyacinthoides	bowstring hemp	II	CS	TRIE/GLY

Dagny Johnson Key Largo Hammocks Botanical State Park

County: Monroe
PCL Size: 2,415 acres
Project ID: FK-070 485 acres $90,164

Project Manager: Florida Park Service (DEP)
Pat Wells, Park Manager
P. O. Box 487, Key Largo, FL 33037
Phone: 305-451-1202, Fax: 305-853-3555
E-mail: pat.wells@dep.state.fl.us

Dagny Johnson Key Largo Hammocks Botanical State Park includes most of the undeveloped land east of County Road 905 in north Key Largo. The undisturbed portions of this project consist primarily of rockland hammock. State-listed threatened and endangered plants on or near this site include West Indian mahogany, Florida boxwood, and milkbark. This project included two sites in Key Largo State Park and one site at Curry Hammock State Park.

The 406-acre Port Bougainville parcel was acquired in the mid-1980s, after a failed development attempt had scarified, quarried, or buried under dredge spoil an area nearly 200 acres in size. One large filled area covers approximately 4.3 acres, to an estimated 50-feet elevation. The scarified areas and spoil were overgrown with a mixture of native plants infiltrated by Burma reed, Brazilian pepper, Australian pine, and other invasive plants.

The *Furcraea* project site is located near the northern end of Key Largo park property. This project involved initial treatment of Mauritius hemp (*Furcraea foetida*). The isolated infestation appeared to be either a dumping site or near an old homestead. The dense infestation included hundreds of plants of sizes ranging from inches to eight-feet tall and covered an area of about 6,400 square feet. The site is adjacent to and accessed by a trail that leaves the edge of the highway and bike path and goes east into the hammock.

The Curry Hammock site, a 44-acre parcel known as the Frank's property, is on Grassy Key. It contains coastal berm, mangrove swamp, marine tidal marsh, and an interior lagoon. Mosquito ditches are found west of the interior lagoon. The infestation was minimal in population size and scattered in distribution throughout this parcel.

Species Treated	Common Name	Rank	Type	Herbicide
Casuarina spp.	Australian pine	I	BB	TRIE
Colubrina asiatica	lather leaf	I	BB	TRIE
Lantana camara	lantana	I	BB	TRIE
Neyraudia reynaudiana	Burma reed	I	FL	TRIA
Schinus terebinthifolius	Brazilian pepper	I	BB	TRIE
Thespesia populnea	seaside mahoe	I	FL	TRIA
Leucaena leucocephala	lead tree	II	CS	TRIE
Sansevieria hyacinthoides	bowstring hemp	II	CS	TRIA
Xanthosoma sagittifolium	elephant ear	II	CS	GLY
Furcraea foetida	Mauritius hemp	n/a	CS	GLY

Long Key State Park

County: Monroe
PCL Size: 911 acres
Project ID: FK-066 100 acres $52,681

Project Manager: Florida Park Service (DEP)
Catherine Close, Park Manager
P. O. Box 776, Long Key, Florida 33001
Phone: 305-664-4815, Fax: 305-664-2629
E-mail: catherine.close@dep.state.fl.us

This project targeted four areas within Long Key State Park for maintenance control. The first site, along the Golden Orb Nature Trail, consisted of a narrow 11-acre coastal berm that runs parallel to the shoreline. The coastal berm continues straight where the nature trail curves to the left, and ends in a mature red mangrove forest.

The second site, located on the bay side near the main park entrance, was a 28-acre area dominated by coastal rock barren interspersed with hardwood hammock. Rare species including jumping cactus (*Opuntia triacantha*), yellow hibiscus (*Cienfuegosia yucatanensis*), and Cape Sable thoroughwort (*Chromolaena frustrata*) grew on a portion of this site. Areas where these species occurred were treated by park staff.

The third site comprised 36 acres located on Long Key Point, which is accessible only by boat. The area contains beach/dune and coastal berm habitat that quickly grades into mangrove tidal swamp. The site is on a narrow coastal berm that runs parallel to the shoreline. The fourth site encompassed a narrow strip of hardwood hammock northeast of the park entrance and adjacent to the bicycle path.

Species Treated	**Common Name**	**Rank**	**Type**	**Herbicide**
Casuarina spp.	Australian pine	I	HS	TRIE
Colubrina asiatica	lather leaf	I	BB	TRIE
Schinus terebinthifolius	Brazilian pepper	I	BB	TRIE
Thespesia populnea	portia	I	CS	TRIE
Leucaena leucocephala	lead tree	II	CS	TRIE
Sansevieria hyacinthoides	bowstring hemp	II	CS	TRIE

Key West Naval Air Station

County: Monroe
PCL Size: 6,323

Project ID: FK-067	10 acres	$130,425
Project ID: FK-072	104 acres	$35,607

Project Manager: U.S. Navy
Edward Barham, Natural Resources Manager
Post Office Box 9007, Key West, Florida 33040-9007
Phone: 305-293-2911, Fax: 305-293-2542
E-mail: barhamed@naskw.navy.mil

A marsh without invading trees and shrubs—just right for a marsh rabbit.

Two projects were conducted at Key West NAS, one each for initial control and maintenance control. The first project was comprised of three sites located on Boca Chica and Truman Annex. The Boca Chica Field Weapons Area site, a filled scarified area within the southwest corner of Boca Chica, included four discrete locations totaling 3.5 acres adjacent to mangrove wetlands, open water, and habitat for the endangered Lower Keys marsh rabbit (*Sylvilagus palustris hefneri*). North Boca Chica is an old "Hawk Missile Site" of approximately 5 acres adjacent to mangrove wetlands, open water, and land managed by the Department of the Interior. The Truman Annex site contained two beach areas totaling approximately 1 acre. This site is adjacent Fort Zachary Taylor State Park. The beach is a potential nesting habitat for threatened and endangered sea turtles. The second project involved maintenance control of earlier project areas on Boca Chica and Geiger Key, particularly areas that provide habitat for the Lower Keys marsh rabbit (*Sylvilagus palustris hefneri*).

Species Treated	Common Name	Rank	Type	Herbicide
Casuarina equisetifolia	Australian pine	I	BB/CS	TRIE/TRIA
Casuarina equisetifolia	Australian pine	I	MC	n/a
Schinus terebinthifolius	Brazilian pepper	I	CS	TRIE
Thespesia populnea	seaside mahoe	I	CS	TRIE
Hibiscus tiliaceus	mahoe	II	MC	n/a
Leucaena leucocephala	lead tree	II	CS	TRIE
Sansevieria hyacinthoides	bowstring hemp	II	CS	TRIE

Florida Keys Wildlife and Environmental Area

County: Monroe
PCL Size: 1,809 acres
Project ID: FK-071 65 acres $35,982

Site Manager: Fish and Wildlife Conservation Commission
Randy Grau
P.O. Box 430541, Big Pine Key, Florida 33043
Phone: 305-872-0022
E-mail: randy.grau@myfwc.com

The Florida Keys WEA is managed primarily for the conservation and protection of unique native habitats and threatened and endangered species. The project consisted of maintenance control on four units of the WEA. The Dove Creek Hammocks unit of the Florida Keys WEA is located at the southern end of Key Largo. The Tavernier Creek, Lake San Pedro, and Snake Creek units are on Plantation Key. Natural communities in the project area include tropical hardwood hammock, mangrove forest, salt marsh/buttonwood, and open water. Exotics found included lead tree, lather leaf, Brazilian pepper, Australian pine, seaside mahoe, beach naupaka, and other ornamental species. BIPM funded previous control efforts in two areas of Dove Creek Hammocks and one area within Lake San Pedro. BIPM-funded Exotic Plant Control Technicians performed control operations on the Tavernier and Snake Creek units.

Species Treated	Common Name	Rank	Type	Herbicide
Colubrina asiatica	lather leaf	I	CS	TRIE
Schinus terebinthifolius	Brazilian pepper	I	CS	TRIE
Thespesia populnea	seaside mahoe	I	CS	TRIA
Ipomoea carnea fistulosa	shrub morning-glory	II	CS	TRIE
Leucaena leucocephala	lead tree	II	CS	TRIE
Ricinus communis	castor bean	II	CS	TRIE
Sansevieria hyacinthoides	bowstring hemp	II	CS	TRIE

Florida Keys Overseas Heritage Trail

County: Monroe
PCL Size: 95.8 acres
Project ID: FK-060 625 acres $143,943

Project Manager: Monroe County Growth Management Division
Elizabeth Holloway, Florida Keys Scenic Highway Coordinator
2798 Overseas Highway, Marathon, Florida 33050-2227
Phone: 305-852-2511
E-mail: holloway-liz@monroecounty-fl.gov

The project was located entirely within the bounds of the Overseas Heritage Trail portion of the Florida Department of Transportation's US Highway 1 right-of-way between Mile Marker 4 to MM 106. The Trail is located in the Florida Keys portion of Monroe County and includes land within unincorporated Monroe County, the City of Marathon, and the City of Layton.

Each stretch of trail had different species of concern, but Brazilian pepper, Australian pine, lather leaf, lead tree, seaside mahoe, and non-native scaevola were the most abundant. Some stretches of trail are bridges with no attention required and others have been partially treated by other means. Monroe County provided matching costs for time and materials with a value of $22,724.

Species Treated	**Common Name**	**Rank**	**Type**	**Herbicide**
Casuarina spp.	Australian pine	I	CS	TRIE
Colubrina asiatica	lather leaf	I	CS	TRIE
Scaevola sericea	beach naupaka	I	CS	TRIE
Schinus terebinthifolius	Brazilian pepper	I	CS	TRIE
Thespesia populnea	seaside mahoe	I	CS	TRIA
Hibiscus tiliaceus	mahoe	II	CS	TRIE
Leucaena leucocephala	lead tree	II	CS	TRIE

Monroe County Conservation Lands

County: Monroe
PCL (*see below*)
PCL Size (*see below*)

Project ID: FK-069	1,650 acres	$62,400
Project ID: FK-073	10 acres	$56,700

Project Manager: Monroe County Growth Management Division
Elizabeth Bergh, Monroe County Land Steward
2798 Overseas Highway, Marathon, Florida 33050-2227
Phone: 305-289-2511
E-mail: bergh-beth@monroecounty-fl.gov

Monroe County owns nearly 2,000 acres of scattered conservation lands throughout the Florida Keys. Natural communities within the Keys include tropical hardwood hammock, pine rocklands, freshwater wetlands, and mangrove swamp. These lands are home to a number of rare plants and animals, some of which occur nowhere else in the world, including the endangered Blodgett's wild mercury (*Argythamnia blodgettii*), locustberry (*Byrsonima lucida*), silver palm (*Coccothrinax argentata*), and Garber's spurge (*Chamaesyce garberi*). Rapidly expanding populations of Brazilian pepper, Australian pine, and lather leaf infested the native habitats of the county's lands.

The first project targeted county owned or managed parcels located on twenty-two of the Upper, Middle, and Lower Keys. The project addressed parcels not treated in the previous fiscal year. Most individual parcels are only 0.1 acre in size, but many are contiguous and combine to form much larger management units. A team of two plant control technicians funded by BIPM performed the work. Monroe County provided matching funds of $8,696 and an in-kind match of $45,841 for herbicide, a vehicle, and crew materials.

The second project provided funding for a private contractor to remove several large Australian pines located too close to improvements (such as power lines, roads, and houses) to be safely removed by the plant control technicians. Monroe County provided an in-kind match of $21,300 in time and materials.

Species Treated	**Common Name**	**Rank**	**Type**	**Herbicide**
Albizia lebbeck	woman's tongue	I	BB	TRIE
Bischofia javanica	bischofia	I	BB	TRIE
Casuarina equisetifolia	Australian pine	I	CS	TRIA
Colubrina asiatica	lather leaf	I	CS	TRIA
Eugenia uniflora	Surinam cherry	I	BB	TRIE
Lantana camara	lantana	I	BB	TRIE
Neyraudia reynaudiana	Burma reed	I	FL	GLY
Scaevola sericea	beach naupaka	I	BB	TRIE
Schinus terebinthifolius	Brazilian pepper	I	BB	TRIE
Thespesia populnea	seaside mahoe	I	BB	TRIE
Tradescantia spathacea	oyster plant	I	BB	TRIE
Epipremnum pinnatum	pothos	II	BB	TRIE

Hibiscus tiliaceus	mahoe	II	BB	TRIE
Leucaena leucocephala	lead tree	II	CS	TRIE
Panicum maximum	guinea grass	II	FL	GLY
Sansevieria hyacinthoides	bowstring hemp	II	FL	GLY
Sphagneticola trilobata	wedelia	II	BB	TRIE
Hylocereus undatus	night-blooming cactus	n/a	HP	n/a

Florida Keys Refuges Invasive Exotic Plant Control Technicians

County: Monroe
PCL: *various*
Project ID: FK-065 1,000 acres $83,000

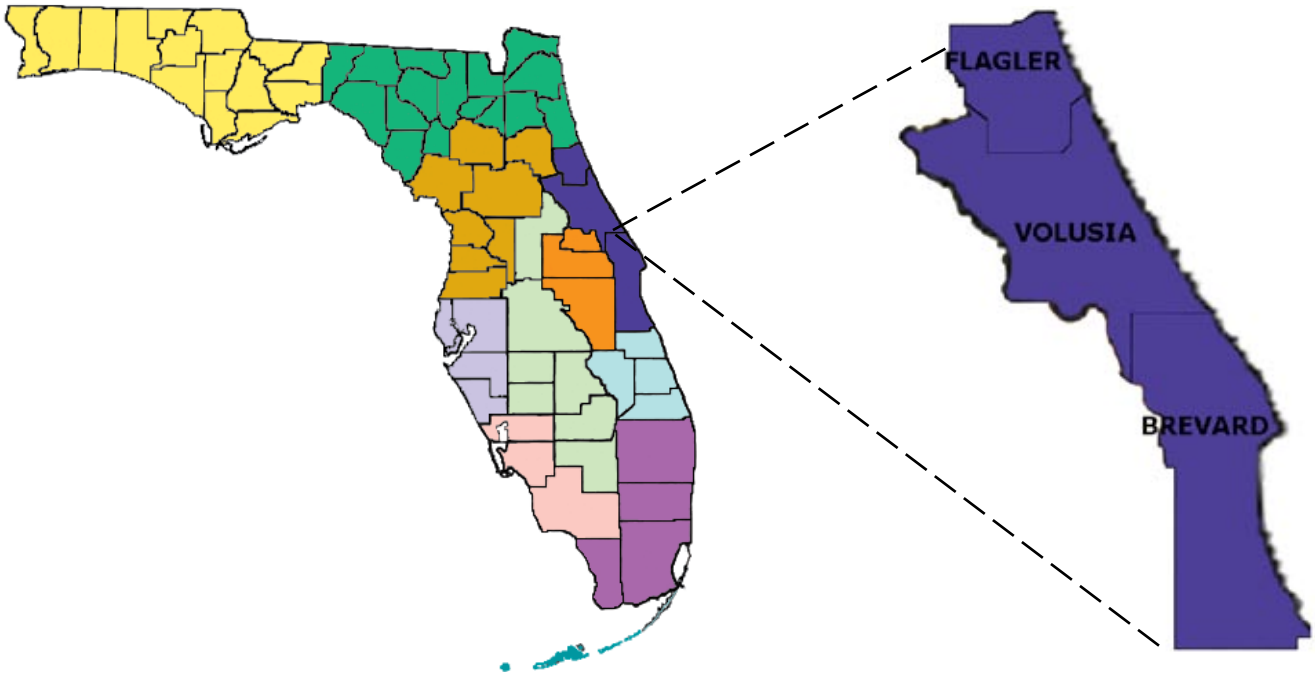
Project Manager: Fish and Wildlife Conservation Commission
Randy Grau
P.O. 541, Big Pine Key, Florida 33043
Phone: 305-872-0022
E-mail: randy.grau@myfwc.com

National Wildlife Refuges (NWR) in the Florida Keys include Key Deer (9,368 acres), Great White Heron (192,788 acres), Key West (208,308 acres), and Crocodile Lake (6,688 acres). The Florida Keys Wildlife and Environmental Area (WEA) includes 2,344 acres of land on Key Largo, Big Pine Key, No Name Key, the backcountry islands of the Great White Heron NWR, and several other keys in the Lower Florida Keys. Natural communities within the NWR/WEA include tropical hardwood hammock, pine rocklands, freshwater wetlands, and mangrove swamp. These lands are home to a number of rare plants and animals, five of which occur nowhere else in the world. Rapidly expanding populations of Brazilian pepper, Australian pine, and lather leaf infest the native habitats of the NWR/WEA. This project targeted these three species and other invasive plants on Key Largo, Big Pine, No Name, Big and Little Torch, Summerland, Cudjoe, Sugarloaf, and Boca Chica Keys, and the backcountry islands of the Lower Keys.

Public conservation lands extend throughout the Keys and include individual lots ranging from 5000 sq. ft. to parcels several hundred acres in size. These properties are owned by the US Department of the Interior, the State of Florida, the South Florida Water Management District, and Monroe County. All lands are publicly owned and managed by the NWR/WEA for conservation of rare plant and animal species, including the Key deer. A team of plant control technicians funded by BIPM performed the work. USFWS and FWC provided matching costs for herbicide, vehicles, crew equipment, and mechanical equipment with a total value of $15,500.

Species Treated	**Common Name**	**Rank**	**Type**	**Herbicide**
Casuarina equisetifolia	Australian pine	I	BB	TRIE
Colubrina asiatica	lather leaf	I	CS	TRIE
Schinus terebinthifolius	Brazilian pepper	I	BB/CS	TRIE
Thespesia populnea	seaside mahoe	I	CS	TRIE
Scaevola sericea	beach naupaka	I	CS	TRIE
Hibiscus tiliaceus	mahoe	II	CS	TRIE
Leucaena leucocephala	lead tree	II	CS	TRIE

Mosquito Coast Working Group Projects



Pine Island Conservation Area

County: Brevard
PCL Size: 929 acres

Project ID: MC-075	85 acres	$102,147
Project ID: MC-083	60 acres	$165,579

Project Manager: Brevard County Parks & Recreation
Steve McGuffey, Assistant Land Manager
5560 North US Highway 1, Melbourne, Florida 32940
Phone: 321-255-4466, Fax: 321-255-4499
E-mail: smcguffey@brevardparks.com

The mesic pine flatwoods "island" for which this conservation land is historically named is regionally unique in that large areas grade directly into the Indian River Lagoon and other areas exhibit rapid transitions to isolated freshwater marshes and impounded estuarine marsh and mangrove forest habitats that fringe the Lagoon. Development activities on Pine Island during the 1960s in support of sand mining and mosquito control operations significantly altered the hydrologic regime and structural integrity of the expansive estuarine marsh system historically characterizing this property. Invasive exotic pest plants, primarily Brazilian pepper, exploited the conditions provided by these land disturbances.

Phase 1 of this comprehensive invasive exotic plant removal project was completed in 2001. This first phase effectively treated 42± acres of Brazilian pepper from within approximately 100 acres of mesic pine flatwoods and fringing wetland habitats located in the northwest quadrant of the conservation site. Phase II, which targeted 65± acres infested by approximately 35 acres of Brazilian pepper and 0.25 acres with melaleuca was completed in September 2002. Phase III continued the exotic species removal effort on 127 acres and was completed in May 2004. Phase IV treated 170 acres in 2005 and Phase V treated 24.5 acres in 2006.

This project, the sixth and final phase of ongoing work, treated Brazilian pepper in primarily hydric hammock and impounded freshwater marsh natural communities. Brazilian pepper occurred throughout the project area in varying degrees of coverage from thirty to eighty percent, with the majority of the site exhibiting dense coverage. Completion of this phase achieved the goal of initial treatment of invasive species on the entire 929-acre sanctuary. The Brevard County EEL Program provided $11,280 of in-kind matching funds for this final phase.

Species Treated	**Common Name**	**Rank**	**Type**	**Herbicide**
Schinus terebinthifolius	Brazilian pepper	I	BB/CS	TRIE

Pine Island Conservation Area

Below: The Pine Island project map.

Right: Treated pepper on the edge of a disturbed area.

Archie Carr National Wildlife Refuge

County: Brevard
PCL Size: *various*
Project ID: MC-077 360 acres $97,860

Project Manager: Brevard County Parks & Recreation
Raymond Mojica, EEL Land Manager
5560 North US Highway 1, Melbourne, Florida 32940
Phone: 321-255-4466, Fax: 321-255-4499
E-mail: rmojica@brevardparks.com

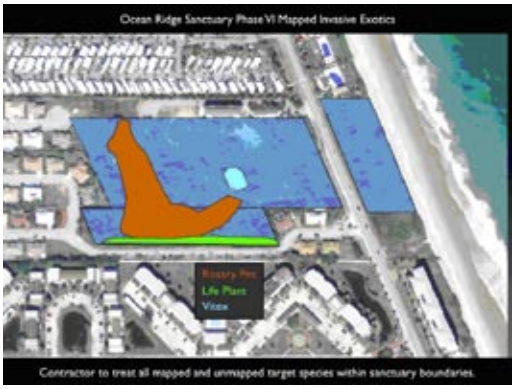
The South Beaches project is a cooperative effort between several partners, including federal, state, and local agencies. The project includes several parcels of publicly owned conservation lands on the South Beaches of Brevard County. All of the property is located within the larger boundary of the Archie Carr National Wildlife Refuge, which encompasses federal, state, local, and private land. The Refuge, designated by Congress in 1990, is recognized as one of the most important areas in the world for nesting loggerhead turtles and the most significant area in North America for nesting green turtles. Natural communities within the project area include coastal strand, maritime hammock, beach dune, and mangrove forest.

This project completed the sixth phase of an aggressive program to remove Brazilian pepper and other invasives from publicly held lands on the south beaches of Brevard County. This project consisted of controlling primarily Brazilian pepper on eight sites. The total control area was 360 acres, with approximately 20 acres at seventy-five percent coverage and the remainder at ten percent coverage.

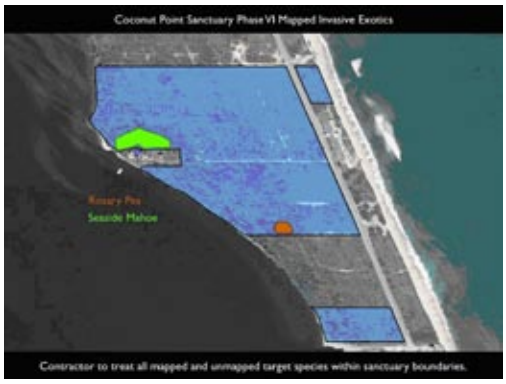
The eight county properties were the 34-acre Barrier Island, 61-acre Coconut Point, 54-acre Hardwood Hammock, 38-acre Hog Point, 18-acre Hog Point Cove, 150-acre Maritime Hammock, 10-acre Ocean Ridge, and 39-acre Washburn Cove Sanctuaries.

Species Treated	**Common Name**	**Rank**	**Type**	**Herbicide**
Abrus precatorius	rosary pea	I	FL	GLY+TRIA
Casuarina spp.	Australian pine	I	BB	TRIE
Dioscorea bulbifera	air-potato	I	FL	GLY+TRIA
Imperata cylindrica	cogon grass	I	FL	GLY
Panicum repens	torpedo grass	I	FL	GLY
Schinus terebinthifolius	Brazilian pepper	I	BB	TRIE
Thespesia populnea	seaside mahoe	I	BB	TRIE
Kalanchoe pinnata	life plant	II	BB	TRIE
Leucaena leucocephala	lead tree	II	BB	TRIE
Sansevieria hyacinthoides	bowstring hemp	II	BB	TRIE
Sphagneticola trilobata	wedelia	II	FL	GLY±TRIA
Vitex trifolia	simpleleaf chastetree	II	BB	TRIE
Carica papaya	papaya	n/a	BB	TRIE
Catharanthus roseus	Madagascar periwinkle	n/a	FL	GLY±TRIA
Sorghum halepense	Johnson grass	n/a	FL	GLY
Urochloa distachya	tropical signal grass	n/a	FL	GLY

Archie Carr National Wildlife Refuge



Ocean Ridge Sanctuary

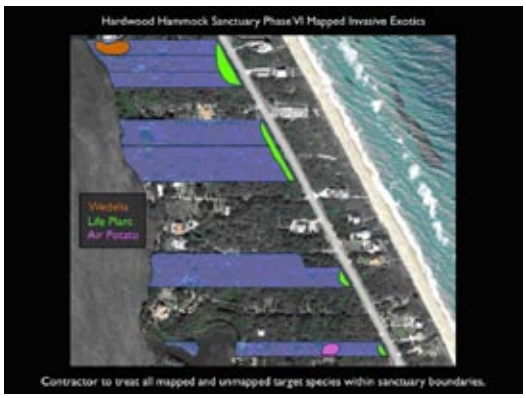


Coconut Point Sanctuary

Washburn Cove Sanctuary

Maritime Hammock Sanctuary

Barrier Island Sanctuary



Hardwood Hammock Sanctuary

Brevard County South Region

County: Brevard
PCL Size: *various*
Project ID: MC-071 231 acres $77,650

Project Manager: Environmentally Endangered Lands Program
Vincent Michault, South Region Assistant Land Manager
5560 North U.S. Highway 1, Melbourne, Florida 32940
Phone: 321-255-4466, Fax: 321-255-4499
E-mail: vmichault@brevardparks.com

The project area included the 54-acre Erna Nixon Park, the City of Palm Bay's 130-acre Turkey Creek Sanctuary, and three EEL properties, the 570-acre Malabar Scrub, the 354-acre Jordan Scrub, and 20-acre Crane Creek Sanctuaries. Natural communities include pine flatwoods and hydric hammock, among others.

In the east tract of Malabar Scrub Sanctuary, Brazilian pepper, downy rose-myrtle, and cogon grass concentrated in the southwest corner of the property and along the eastern and western boundary lines, over a total area of 72 acres. In the west tract of Malabar Scrub, Brazilian pepper and cogon grass concentrated along a highway that bisects the property from north to south for 3,200 feet. Rosary pea infested the northernmost 10 acres of the west tract, which is contiguous to Turkey Creek Sanctuary. Invasives in the Turkey Creek Sanctuary consisted of Brazilian pepper and rosary pea scattered sparsely throughout 65 acres of the property, and a 2-acre patch of cogon grass.

In the main portion of the Jordan Scrub Sanctuary, Brazilian pepper and cogon grass were mostly located along a highway, a property line, an old ditch, and a major trail, traversing a total of 2.2 miles. In smaller tracts of Jordan Scrub Sanctuary, rosary pea and Brazilian pepper covered a total of 16 acres. Brazilian pepper, rosary pea, air potato, and Caesar's weed densely infested all 20 acres of Crane Creek Sanctuary. In Erna Nixon Park, sparse Brazilian pepper, air-potato, cogon grass, shoebutton ardisia, climbing fern, tradescantia, and Caesar's weed occurred across 38 acres.

This project was a partnership between Brevard County's EEL Program, Brevard County's Erna Nixon Park, and the City of Palm Bay's Turkey Creek Sanctuary. Brevard County and the City of Palm Bay provided an in-kind match of $14,450 in time and materials.

Species Treated	Common Name	Rank	Type	Herbicide
Abrus precatorius	rosary pea	I	FL	GLY+MET
Albizia julibrissin	mimosa	I	CS	TRIE
Ardisia elliptica	shoebutton ardisia	I	FL	GLY+MET
Dioscorea bulbifera	air-potato	I	FL	GLY+MET
Eugenia uniflora	Surinam cherry	I	CS	TRIE
Imperata cylindrica	cogon grass	I	FL	GLY+MET
Lantana camara	lantana	I	FL	GLY+MET
Lygodium japonicum	Japanese climbing fern	I	FL	GLY+MET
Lygodium microphyllum	Old World climbing fern	I	FL	GLY+MET
Melaleuca quinquenervia	melaleuca	I	CS	TRIE

Brevard County South Region

Species Treated	Common Name	Rank	Type	Herbicide
Nephrolepis spp.	sword fern	I	FL	GLY+MET
Rhodomyrtus tomentosa	downy rose-myrtle	I	FL	GLY+MET
Schinus terebinthifolius	Brazilian pepper	I	CS	TRIE
Tradescantia fluminensis	tradescantia	I	FL	GLY+MET
Broussonetia papyrifera	paper mulberry	II	CS	TRIE
Melia azedarach	Chinaberry	II	CS	TRIE
Urena lobata	Caesar's weed	II	FL	GLY+MET

Erna Nixon Park

Crane Creek Sanctuary

Turkey Creek Sanctuary

Malabar Scrub Sanctuary

Jordan Scrub Sanctuary

***Pepper Sweep* Maintenance**

County: Volusia
PCL: *various*
Project ID: MC-074 7,183 acres $75,000

Project Manager: East Volusia Mosquito Control District
David Farr
801 South Street, New Smyrna Beach, Florida 32168
Phone: 386-424-2920, Fax: 386-424-2924
E-mail: dfarr@co.volusia.fl.us

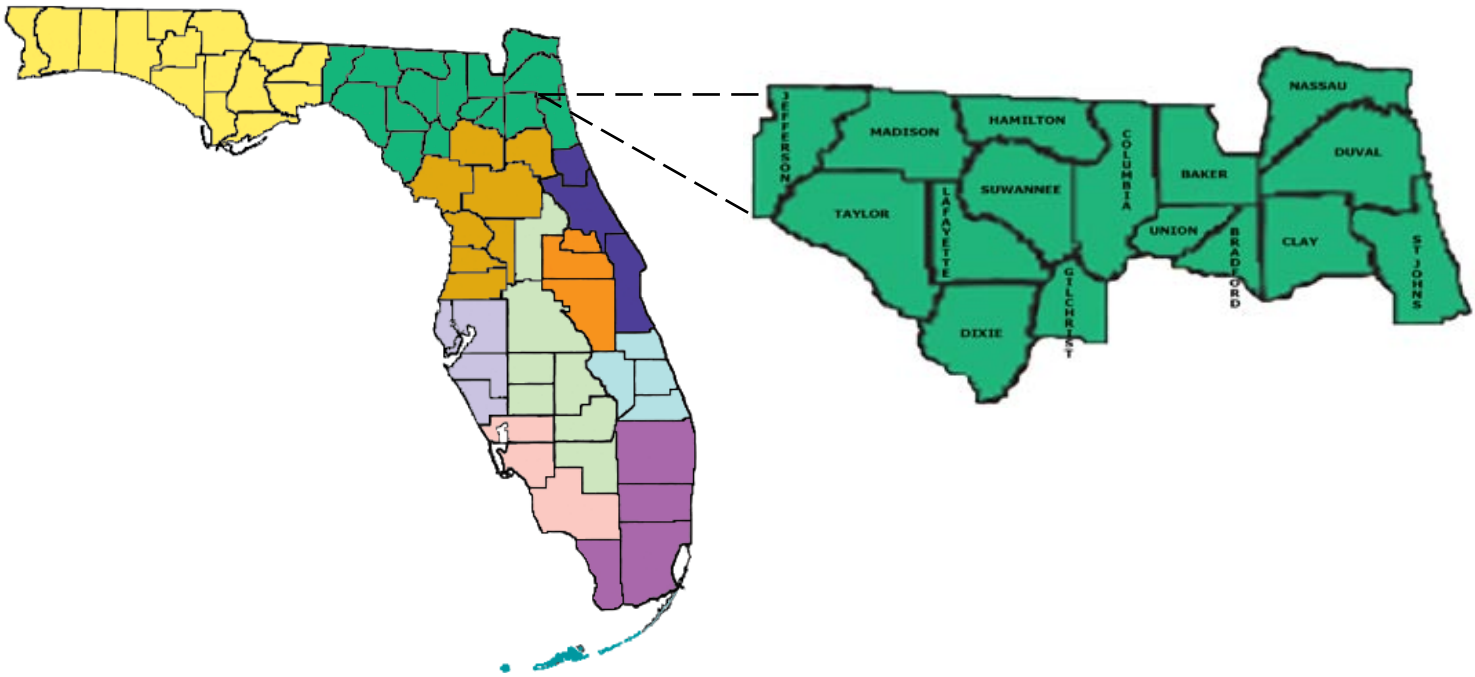
This maintenance control project included a number of county, state, and federal parks within Volusia County that were the subject of initial or maintenance control work under six previous "Pepper Sweeps" (2000-2006). Natural communities found on these conservation areas include coastal dune, coastal strand, maritime hammock, coastal strand, oak scrub, live oak hammock, mangrove swamp, and tidal marsh. The project was divided into three project regions that encompassed a total of ten project sites:

Site 1: Bulow Creek (2,000 acres) contained 45 acres of Brazilian pepper and 1.5 acres of Australian pine on several isolated "islands" within the tidal marsh area.
Site 2: Canaveral National Seashore (2,500 acres) initially contained 100 acres of dense Brazilian pepper and 4 acres of Australian pine.
Site 3: Lighthouse Point Park (62 acres) contained 11 acres of dense Brazilian pepper.
Site 4: Smyrna Dunes Park (178 acres) contained 56 acres of pepper.
Site 5: North Peninsula State Recreation Area, Highbridge Park, Highbridge Road, and Mound Grove (total 480 acres) contained 55 acres of Brazilian pepper.
Site 6: Seminole Rest and Riverbreeze Park (total 55 acres) contained 17 acres of Brazilian pepper.
Site 7: Canaveral Islands (810 acres) contained 35 acres of Brazilian pepper.
Site 8: Bicentennial Park and Seabridge Park (total 43 acres) contained 8 acres of Brazilian pepper.
Site 9: Doris Leeper Spruce Creek Preserve and Spruce Creek Park (total 920 acres) contained 55 acres of Brazilian pepper and 6 acres of Australian pine.
Site 10: Tomoka Spoil and Tomoka Shoreline (total 135 acres) contained 58 acres of dense Brazilian pepper and 7 acres of Australian pine.

Volusia County provided an in-kind contribution of $4,000 in time and materials to this project.

Species Treated	**Common Name**	**Rank**	**Type**	**Herbicide**
Casuarina spp.	Australian pine	I	BB	TRIE
Lantana camara	lantana	I	BB	TRIE
Schinus terebinthifolius	Brazilian pepper	I	BB/CS	TRIE+IMZ

Northeast Working Group Projects



Santa Fe River Basin

County: Alachua, Bradford
PCL Size: 8,926 acres
Project ID: NE-031 51.3 acres $48,000

Project Manager: Suwannee River Water Management District
Chris Benson
9225 CR 49, Live Oak, Florida 32060
Phone: 386-362-1001, Fax: 386-362-1056
E-mail: benson_c@srwmd.state.fl.us

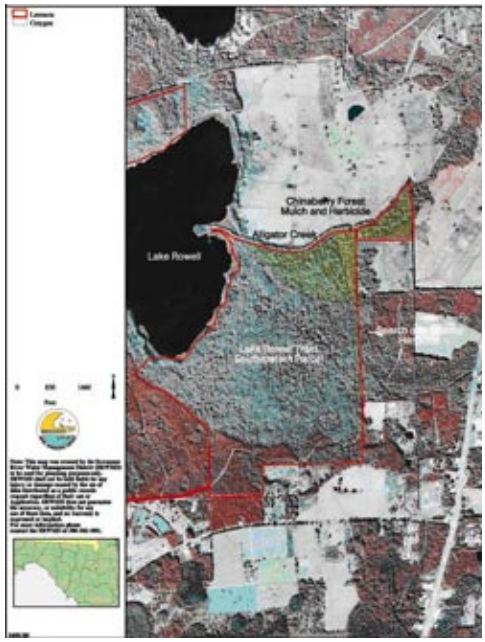
The project area comprised seven sites within five tracts owned and managed by the Suwannee River Water Management District (SRWMD) along Lake Rowell and the Santa Fe River. These tracts make up the eastern half of the Santa Fe River Basin and encompass the majority of SRWMD fee lands on the entire length of the river. Two of these tracts, Santa Fe Swamp (5,707 acres) and Lake Alto (1,555 acres), act as the headwaters for the river.

All of the tracts are floodplain forest with small upland buffers along several miles of lake and river frontage. On the northeast side of Lake Rowell, there are two tracts, 74 and 16 acres in size. The Santa Fe River, which is also the county line between Bradford and Alachua Counties, flows almost directly through the center of the 837-acre Mud Swamp tract. Two parcels, 576 and 161 acres in size, make up the Boston Farms tract. These parcels share a boundary with the University of Florida.

The SRWMD contributed an in-kind match of $1,485.50 in time and materials.

Species Treated	Common Name	Rank	Type	Herbicide
Imperata cylindrica	cogon grass	I	FL	GLY
Lygodium japonicum	Japanese climbing fern	I	FL	GLY
Triadica sebifera	Chinese tallow	I	BB	TRIE
Melia azedarach	Chinaberry	II	BB	TRIE

Lake Rowell Tract



County: Bradford
PCL Size: 593 acres
Project ID: NE-030 125 acres $31,859

Project Manager: Suwannee River Water Management District
Chris Benson
9225 CR 49, Live Oak, Florida 32060
Phone: 386-362-1001, Fax: 386-362-1056
E-mail: benson_c@srwmd.state.fl.us

The southeastern parcels of the Lake Rowell tract total nearly 550 acres. The project area is a floodplain forest community, common along lakeshores between the floodplain swamp and the adjacent upland communities. Alligator Creek runs along the north boundary of the project site into Lake Rowell. An approximately 25-acre area in the northeast corner of one of the parcels contained Chinaberry, climbing fern, and air-potato in high densities. Another 100 acres of parcels had scattered Chinaberry, camphor tree, and climbing fern.

Prior to the 2004 hurricanes, the 25-acre project area was a Chinaberry monoculture with a few scattered native maples and elms. The hurricanes in 2004 created tornadoes that swept through the project area and blew over the majority of the Chinaberry trees and blew down most of the air-potato and climbing fern. The downed trees were mulched in 2006 with funds from BIPM. Re-sprouting from the mulched trees and downed vines received maintenance control under this project.

Species Treated	Common Name	Rank	Type	Herbicide
Albizia julibrissin	mimosa	I	BB	TRIE
Cinnamomum camphora	camphor tree	I	BB	TRIE
Lantana camara	lantana	I	BB	TRIE
Ligustrum spp.	privet	I	BB	TRIE
Lygodium japonicum	Japanese climbing fern	I	FL	GLY+MET
Solanum viarum	tropical soda apple	I	BB	TRIE
Triadica sebifera	Chinese tallow	I	BB	TRIE
Melia azedarach	Chinaberry	II	BB	TRIE

Belmore State Forest

County: Clay
PCL Size: 8,736 acres
Project ID: NE-035 14 acres $2,500

Project Manager: Division of Forestry (DACS)
Heather Venter, Biological Scientist II
1337 Long Horn Road, Middleburg, Florida 32068
Phone: 904-291-5530, Fax: 904-291-5537
E-mail: venterh@doacs.state.fl.us

Belmore State Forest is comprised of various native plant communities including sandhill, mesic flatwoods, baygall, bottomland forest, hydric flatwoods, seepage slope, and dome swamp. The five control sites were primarily located along roadsides and along the edge of an old camp site.

Species Treated	Common Name	Rank	Type	Herbicide
Lygodium japonicum	Japanese climbing fern	I	FL	GLY+MET
Sesbania punicea	purple sesban	II	CS	TRIA

Jennings State Forest

County: Clay, Duval
PCL Size: 23,995 acres
Project ID: NE-034 26.5 acres $5,980

Project Manager: Florida Division of Forestry (DACS)
Heather Venter, Biological Scientist II
1337 Long Horn Road, Middleburg, Florida 32068
Phone: 904-291-5530, Fax: 904-291-5537
E-mail: venterh@doacs.state.fl.us

Jennings State Forest is a large expanse of sandhill and pine flatwoods that contains rare and endangered plants such as Bartram's ixia. Other natural communities present include scrubby flatwoods, wet flatwoods, baygall, seepage slope, and cypress swamp.

Due to the high traffic on Forest roads, the increasing urban-interface along the boundaries, and lingering results of previous land use, there continues to be reoccurring seed-sources for invasive species. This project was for treatment of a powerline right-of-way and a single ditch for the invasion of torpedo grass, as well as a patch of torpedo grass and cogon grass within a newly planted longleaf pine restoration area. DOF provided an in-kind match of $2,590 in time and materials.

Species Treated	Common Name	Rank	Type	Herbicide
Imperata cylindrica	cogon grass	I	FL	GLY+IMZ
Panicum repens	torpedo grass	I	FL	GLY+IMZ

Big Bend Wildlife Management Area

County: Dixie, Taylor
PCL Size: 58,435 acres
Project ID: NE-032 1 acre $2,043

Project Manager: Fish & Wildlife Conservation Commission
Nuria Sancho
663 Plantation Road, Perry, Florida 32348
Office: 850-838-9016, Fax: 850-838-1305
E-mail: nuria.sancho@myfwc.com

The Big Bend Wildlife Management Area is comprised of several individual units: Jena, Tide Swamp, Spring Creek, Hickory Mound, and Snipe Island. The project area was in the Jena and Tide Swamp Units. These units contain rare plant species such as Florida corkwood (*Leitneria floridiana*).

In the Tide Swamp Unit there were five torpedo grass treatment sites in roadside areas adjacent to mesic and hydric flatwoods and hydric hammocks. In the Jena Unit there were three roadside treatment areas, one each of purple sesban, torpedo grass, and Chinese brake fern, adjacent to mesic pine flatwoods, hydric hammock, high salt marsh, and sandhill communities. The total combined area occupied by these plants was less than one acre.

Species Treated	Common Name	Rank	Type	Herbicide
Albizia julibrissin	mimosa	I	BB	TRIE
Panicum repens	torpedo grass	I	FL	GLY+IMZ
Pteris vittata	Chinese brake fern	II	FL	GLY+IMZ
Sesbania punicea	purple sesban	II	BB	TRIE

Fort George Island Cultural State Park

County: Duval
PCL Size: 629 acres
Project ID: NE-033 7 acres $3,400

Project Manager: Florida Park Service (DEP)
Robert Joseph, Park Manager
12157 Heckscher Drive, Jacksonville, Florida 32226
Phone: 904-251-2323, Fax: 904-251-2325
E-mail: robert.joseph@dep.state.fl.us

The threatened peperomia, here being threatened by the invasive confederate jasmine.

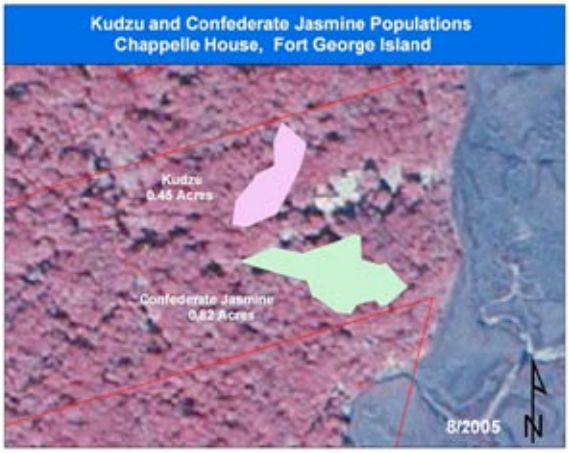
The project area is a newly acquired addition to the state park. Fort George is part of the Talbot Islands State Parks and contains numerous historic structures, protected plant populations, and archaeological and historical sites. Fort George is within the boundaries of the Timucuan Ecological and Historical Preserve managed by the National Park Service. The 18-acre Chappelle parcel was added to Fort George in 2004. The natural communities of the Chappelle addition are primarily maritime hammock bounded by expansive salt marshes of the Fort George River.

The project targeted confederate jasmine, kudzu, and cat's claw vine within the area surrounding the Chappelle site cultural landscape. Air-potato located around the Rollins House was also targeted. Control of confederate jasmine is important to preserve populations of the threatened Florida peperomia (*Peperomia obtusifolia*), and wild coffee (*Psychotria nervosa*) populations located at the limits of its northern range. Other spotty exotics such as bamboo, Boston fern, asparagus-fern, and four-o'clocks were identified in the adjacent forest and historic canal.

The Florida Park Service provided $2,775 in matching control funds and $3,000 as an in-kind match in time and materials.

Species Treated	**Common Name**	**Rank**	**Type**	**Herbicide**
Dioscorea bulbifera	air-potato	I	BB	TRIE
Lantana camara	lantana	I	BB	TRIE
Pueraria montana	kudzu	I	FL/BB	TRIE
Melia azedarach	Chinaberry	II	BB	TRIE
Wisteria sinensis	Chinese wisteria	II	BB	TRIE
Trachelospermum jasminoides	confederate jasmine	n/a	FL	TRIA

Fort George Island Cultural State Park



Above: Picking up air-potato "spuds."

Left: Before and after a tree is freed from an invasive's viny grasp.

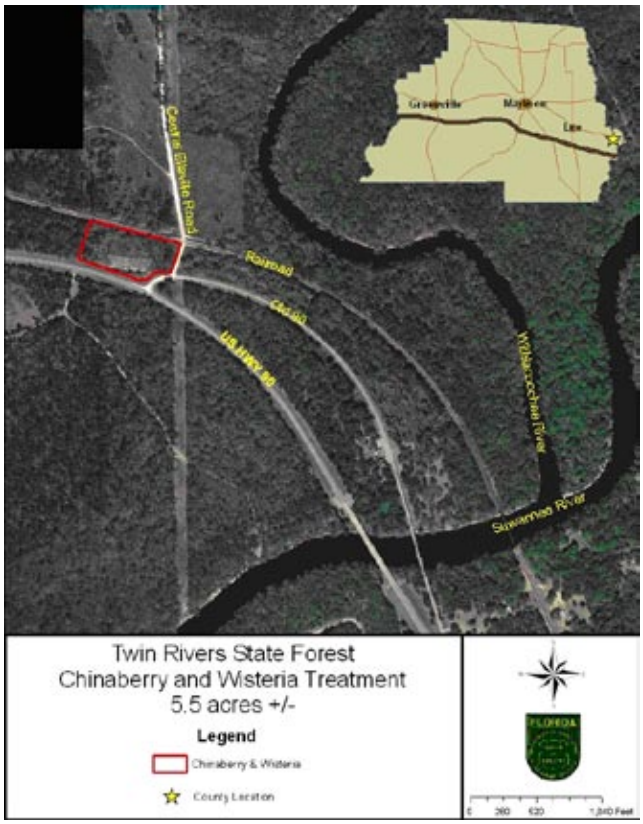
Bottom: A solid invasive groundcover requires ... "Hey! There's a house back here!"

Twin Rivers State Forest

County: Hamilton, Madison, Suwannee
PCL Size: 14,775 acres

Project ID: NE-025	7 acres	$1,846
Project ID: NE-036	11 acres	$875

Project Manager: Division of Forestry (DACS)
Brad Ellis, Forester
7620 133rd Road, Live Oak, Florida 32060
Phone: 386-208-1462, Fax: 386-208-1465
E-mail: ellisjb@doacs.state.fl.us



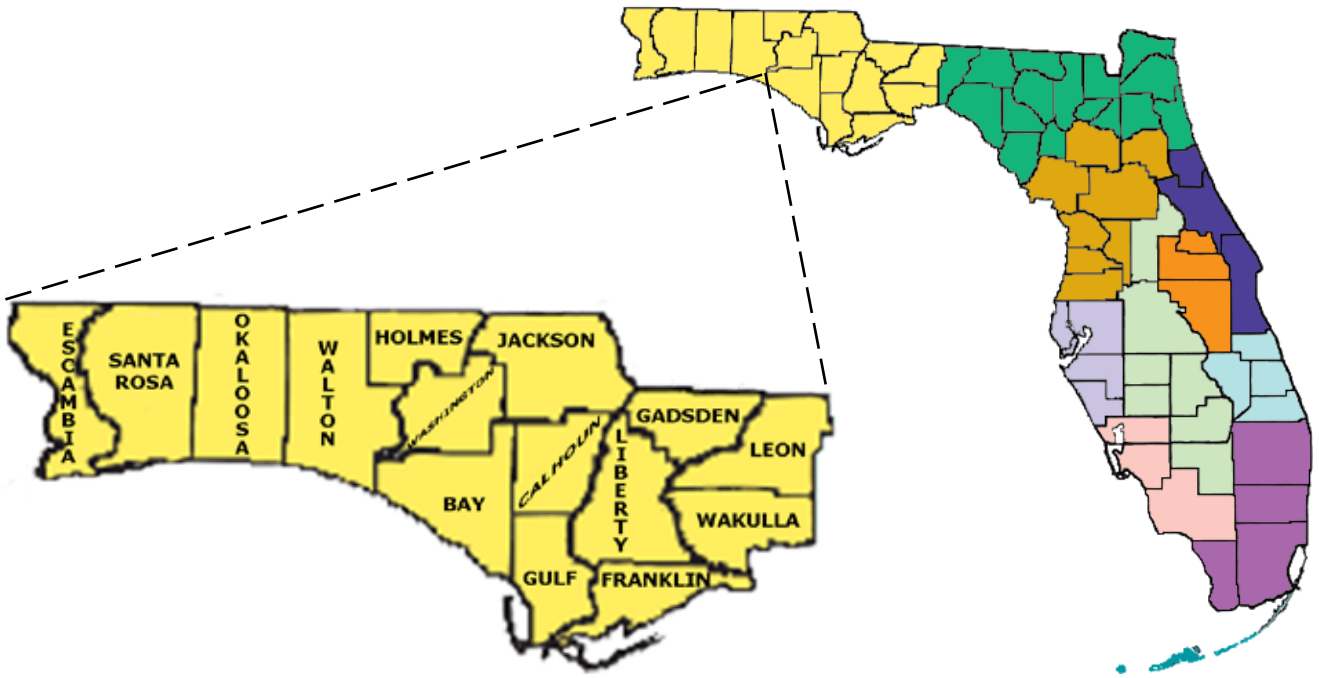
The Twin Rivers State Forest is located along the Withlacoochee and Suwannee Rivers in western Hamilton County, eastern Madison County, and northwest Suwannee County. The Forest is comprised of fourteen noncontiguous tracts within the Withlacoochee River and Middle Suwannee River Basins. The Forest features several natural communities including bottomland forest, floodplain forest, hydric hammock, shrub wetland, floodplain swamp, freshwater wetlands, upland mixed forest, mixed hardwood and pine forest, and sandhill.

The first project targeted an area of sandhill community in the Withlacoochee Tract of the Forest. The site contained a mixture of native vegetation with scattered cogon grass starting to invade. DOF staff previously treated two acres of cogon grass on this tract in 2004.

The second project area lay within the Ellaville Tract on a site disturbed by old homesteads, although any buildings have long been gone. The Suwannee River Water Management District owns the site and the Division of Forestry manages it. The project area contained a mixture of native and exotic vegetation, with about 5.5 acres of Chinaberry at fifty percent coverage.

Species Treated	Common Name	Rank	Type	Herbicide
Albizia julibrissin	mimosa	I	BB	TRIE
Imperata cylindrica	cogon grass	I	FL	GLY+IMZ
Melia azedarach	Chinaberry	II	BB	TRIE

Panhandle Working Group Projects



Chattahoochee Nature Park

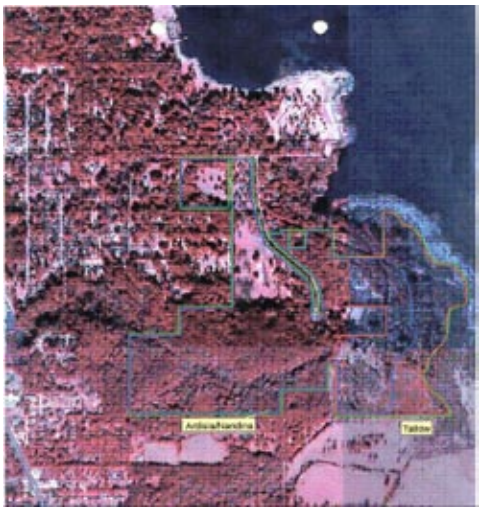
County: Gadsden
PCL Size: 113 acres
Project ID: PH-058 113 acres $46,500

Project Manager: City of Chattahoochee
Clay Wells, Parks and Recreation Director
PO Box 188, Chattahoochee, Florida 32324
Phone: 850-663-8000, Fax: 850-663-3800
E-mail: cwrec@gtcom.net

The Chattahoochee Nature Park on the Apalachicola River hosts a significant example of slope forest, one of Florida's rarest natural communities. The park also contains a ravine and seepage stream, as well as numerous rare plant species, including the federally endangered Florida torreya (*Torreya taxifolia*) and fringed campion (*Silene polypetala*), and the state endangered *Aristolochia tomentosa* (dutchman's pipe) in the floodplain of the Apalachicola River. Japanese honeysuckle posed a direct threat to the endangered fringed campion.

Species Treated	Common Name	Rank	Type	Herbicide
Albizia julibrissin	mimosa	I	BB	TRIE
Ardisia crenata	coral ardisia	I	BB	TRIE
Cinnamomum camphora	camphor tree	I	BB	TRIE
Ligustrum spp.	privet	I	BB	TRIE
Lonicera japonica	Japanese honeysuckle	I	CS	TRIE
Lygodium japonicum	Japanese climbing fern	I	FL	GLY
Nandina domestica	heavenly bamboo	I	BB	TRIE
Triadica sebifera	Chinese tallow	I	BB	TRIE
Aleurites fordii	tung oil tree	II	BB	TRIE
Elaeagnus pungens	silverthorn	II	BB	TRIE
Melia azedarach	Chinaberry	II	BB	TRIE
Morus alba	white mulberry	n/a	BB	TRIE

Apalachicola River Wildlife Environmental Area



County: Gulf
PCL Size: 81,754 acres
Project ID: PH-057 8,793 acres $39,329

Project Manager: Fish and Wildlife Conservation Commission
Patrick Lemons, Biological Scientist II
558 South Murphy Road, Wewahitchka, Florida 32456
Phone: 850-827-2413, Fax: 850-827-2258
E-mail: patrick.lemons@myfwc.com

The project area was the Sauls Creek Unit of the Apalachicola River WEA. This WEA unit encompasses marsh, floodplain swamp, and pine flatwoods along the Apalachicola River. Agricultural fields actively managed in the past as wildlife food plots comprise a large portion of this Unit.

The southern portion of the Unit lies at a lower elevation and much of the habitat is either floodplain swamp or sawgrass marsh that had been diked, ditched, and drained for rice production in the early 1970s. In upland areas, especially disturbed areas such as roadsides and plantations, the most frequent and abundant exotic species was Japanese climbing fern. This fern infested approximately 150 acres overall at a twenty to fifty percent coverage and in some cases had dispersed from ruderal sites into natural communities.

The WEA staff treated Chinese tallow trees on eight acres in the upper Sauls Creek Unit and torpedo grass that occurred in two managed wetland areas. The FWC provided $4,035 of in-kind match in time and materials for this project.

Target Species	Common Name	Rank	Type	Herbicide
Cinnamomum camphora	camphor tree	I	CS	TRIE
Lygodium japonicum	Japanese climbing fern	I	FL	GLY+MET
Triadica sebifera	Chinese tallow	I	CS	TRIE

The Apalachicola River marshes are extremely important to the health of Apalachicola Bay and Florida's seafood industry.

Florida Caverns State Park

County: Jackson
PCL Size: 1,279 acres
Project ID: PH-042 60 acres $10,633

Project Manager: Florida Park Service (DEP)
Charles Smith, Park Services Specialist
3345 Caverns Road, Marianna, Florida 32446
Phone: 850-482-1229, Fax: 850-482-9114
E-mail: charles.e.smith@dep.state.fl.us

A base map with infested areas outlined in red.

Most of Florida Caverns State Park lies in the Chipola River floodplain. The natural communities of the Park are predominantly floodplain forest and upland mixed forest. Thirty acres in the old federal hatchery area on the west side of the park comprise one project area. Much of the treatment site was converted into hatchery ponds in the 1930s. The hatchery was abandoned in the mid-1940s and native hardwoods, mixed with exotic shrubs and trees, re-colonized the ponds.

Chinese privet was the most abundant exotic plant on the site, with numerous small seedlings adjacent to the staff residences. The second project area is thirty acres in the upland hardwood forest around the Visitors Center and along the Bluff Nature Trail on the south end of the park. Nandina and Chinese privet dominated this site. Other woody exotics were lightly scattered through the project area.

Species Treated	Common Name	Rank	Type	Herbicide
Albizia julibrissin	mimosa	I	BB	TRIE
Ardisia crenata	coral ardisia	I	BB	TRIE
Cinnamomum camphora	camphor tree	I	BB	TRIE
Ligustrum lucidum	glossy privet	I	BB	TRIE
Ligustrum sinense	Chinese privet	I	BB	TRIE
Lygodium japonicum	Japanese climbing fern	I	FL	GLY+MET
Nandina domestica	heavenly bamboo	I	BB	TRIE
Triadica sebifera	Chinese tallow	I	BB	TRIE
Elaeagnus pungens	silverthorn	II	BB	TRIE
Melia azedarach	Chinaberry	II	BB	TRIE

Lake Jackson Mounds State Archeological Site

County: Leon
PCL Size: 198 acres
Project ID: PH-044 120 acres $54,890
Project Manager: Florida Park Service (DEP)

Barry Burch, Park Manager
1022 De Soto Park Drive, Tallahassee, FL 32301
Phone: 850-922-6007, Fax: 850-488-0366
E-mail: barry.burch@dep.state.fl.us

This park unit encompasses upland mixed forest, bottomland forest, ravines, and seepage stream natural communities. Rare species on the park include the endangered lance-leaved wake-robin (*Trillium lancifolium*). Coral ardisia was a widely spread exotic species at the park, with dense stands found throughout the western portion of the unit, especially adjacent to the nature trails and seepage streams. Nandina was abundant in the same locations as ardisia. Stem counts of these two exotic species were as high as several thousand per acre in some locations. These exotics were of particular concern in the lowland ravine areas where they threatened native trilliums.

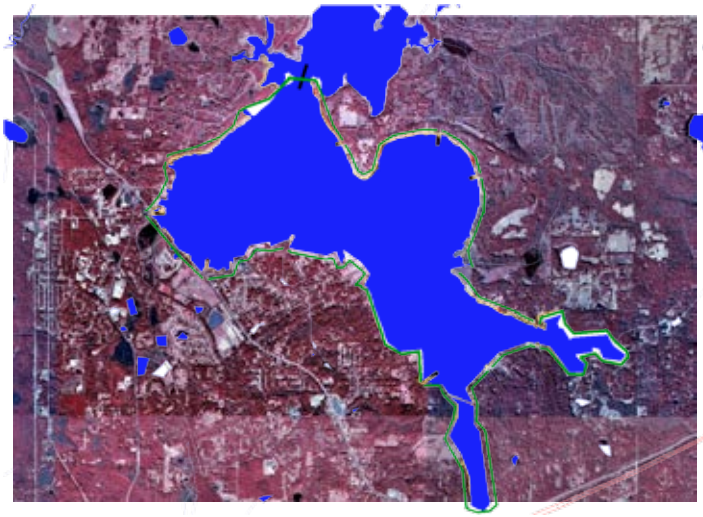
Chinese tallow occurred in dense stands along the unit's southeast and northeast borders and along the entire lakeshore. Tallow stem counts approached several hundred per acre in some areas.

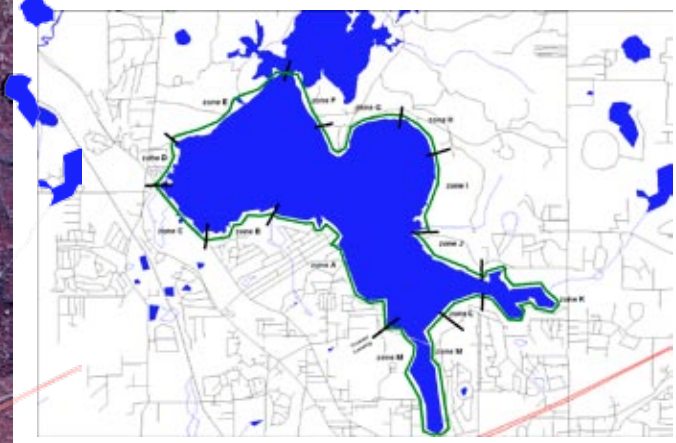
The Florida Park Service provided $3,500 in matching funds for this project.

Target Plant	Common Name	Rank	Type	Herbicide
Albizia julibrissin	mimosa	I	BB	TRIE
Ardisia crenata	coral ardisia	I	BB/FL	TRIE/TRIA
Cinnamomum camphora	camphor tree	I	BB	TRIE
Lygodium japonicum	Japanese climbing fern	I	FL	GLY+MET
Nandina domestica	heavenly bamboo	I	BB	TRIE
Triadica sebifera	Chinese tallow	I	BB	TRIE
Aleurites fordii	tung oil tree	II	BB	TRIE
Melia azedarach	Chinaberry	II	BB	TRIE
Wisteria sinensis	Chinese wisteria	II	BB	TRIE

Lake Jackson

The state park abuts Lake Jackson Aquatic Preserve.





Lake Jackson Aquatic Preserve

County: Leon
PCL Size: 4,700 acres
Project ID: PH-061 621 acres $40,415

Project Manager: Bureau of Invasive Plant Management (DEP)
Jess Van Dyke
3900 Commonwealth Boulevard, Tallahassee, Florida 32399
Phone: 850-245-2831, Fax: 850-245-2835
E-mail: jess.vandyke@dep.state.fl.us

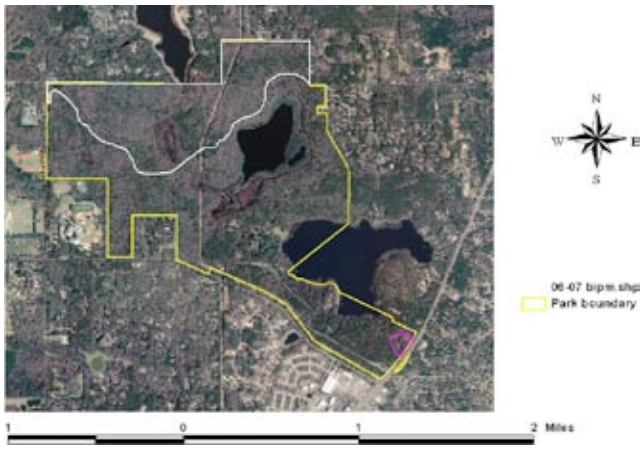
The Lake Jackson, Carr Lake, and Mallard Pond ecosystem is a valuable biological, aesthetic, and recreational resource. The Florida Legislature designated this ecosystem as the Lake Jackson Aquatic Preserve for the primary purpose of preserving and maintaining the biological resources in their essentially natural condition. The expansive freshwater marshes and native submerged vegetation provide exceptional fish, waterfowl, and wading bird habitat. In addition to being an Aquatic Preserve, Lake Jackson is designated as a surface water improvement and management (SWIM) waterbody, and an Outstanding Florida Water.

The preserve includes only the sovereignty submerged lands located below the ordinary high water line (OHWL). Irregularly shaped, the lake body ranges from one half mile to three miles in width, and is approximately eight miles long. Because of the steep hills in the region, numerous sub-basins are formed within the complete drainage area of the lake. The three major basins are the southern watersheds draining into Megginnis Arm and Fords Arm, and an area draining into the northeastern segment of the lake via Ox Bottom Creek. These and other sub-basins comprise a Lake Jackson drainage area of approximately 43.2 square miles.

Numerous wetland tree and woody plant species also inhabit the drier portions of the transitional marsh. These include sweetgum (*Liquidambar styraciflua*), oak (*Quercus* spp.), wax myrtle (*Myrica cerifera*), dog fennel (*Eupatorium* spp.), and elderberry (*Sambucus canadensis*). This area is also infested with Chinese tallow (*Triadica sebifera*). The main basin of the lake was divided into thirteen work zones. The width of each zone extends from the lakeward extent of target vegetation landward to the ordinary high water line (OHWL).

Species Treated	Common Name	Rank	Type	Herbicide
Triadica sebifera	Chinese tallow	I	BB	TRIE

Maclay Gardens State Park



County: Leon
PCL Size: 1,779 acres
Project ID: PH-056 325 acres $112,000

Project Manager: Florida Park Service
Beth Weidner, Park Manager
3540 Thomasville Road, Tallahassee, FL 32308
Phone: 850-487-4556, Fax: 850-487-8808
E-mail: beth.weidner@dep.state.fl.us

Maclay Gardens is located on US Highway 319 in Tallahassee. The park includes 28 acres of formal gardens. The majority of the park consists of secondary growth upland mixed forest, interspersed with steep ravines and slope forests that exhibit high plant diversity and harbor a number of rare species. Slope forest canopy species such as magnolia, beech, and white oak are still present, even in the most severely infested portions of the project area. Several listed species have been planted in the park including Chapman's rhododendron (*Rhododendron chapmanii*), Florida flame azalea (*Rhododendron austrinum*), and Ashe's magnolia (*Magnolia ashei*). Naturally occurring listed species include trout lily (*Erythronium umbilicatum*), heartleaf (*Hexastylis arifolia*), Florida yew (*Taxus floridana*), and Florida torreya (*Torreya taxifolia*).

The formal gardens make up less than one-tenth of the park.

Many invasive exotics such as ardisia, nandina, wisteria, camphor, honeysuckle, privet, and climbing fern grow in scattered, often dense clumps throughout the park. No full treatment of the Lake Overstreet property has been conducted and exotic species, especially ardisia, are expanding into the sensitive ravines. Infestation of the project area was moderate to high with coverage of thirty percent. This project focused on upland mixed forest and slope forest natural communities throughout the Lake Overstreet section of Maclay Gardens. The Florida Park Service contributed $3,500 in matching funds and an additional in-kind match of $500.

Species Treated	Common NameRank	Type	Herbicide	
Ardisia crenata	coral ardisia	I	BB	TRIE
Cinnamomum camphora	camphor tree	I	BB	TRIE
Ligustrum lucidum	glossy privet	I	BB	TRIE
Lonicera japonica	Japanese honeysuckle	I	FL	GLY+MET
Lygodium japonicum	Japanese climbing fern	I	FL	GLY+MET
Nandina domestica	heavenly bamboo	I	BB	TRIE
Pueraria montana	kudzu	I	FL	TRIA
Triadica sebifera	Chinese tallow	I	BB	TRIE
Elaeagnus pungens	silverthorn	II	BB	TRIE
Melia azedarach	Chinaberry	II	BB	TRIE
Wisteria sinensis	Chinese wisteria	II	BB	TRIE

Lafayette Heritage Trail Park

County: Leon
PCL Size: 788 acres
Project ID: PH-060 188 acres $47,200

Project Manager: City of Tallahassee Parks and Recreation
Chuck Goodheart, Park Management Specialist
912 Myers Park Drive, Tallahassee, Florida 32303
Phone: 850-933-6631, Fax: 850-891-0959
E-mail: goodheac@talgov.com

Lafayette Heritage Trail Park includes approximately 600 acres of the Lake Lafayette system. Some of the control sites are islands created in Piney Z Lake. Plants of particular interest include red buckeye, Solomon's seal, bloodroot, basswood, a listed species of *Spiranthes* orchid, and *Tipularia* species. Other forested areas are significant high quality successional forests that include a large population of American beech (*Fraxinus americana*), southern magnolia, white oak, swamp chestnut oak, and large live oaks that are remnants of historic agricultural use. Some of the vegetation within the park is old field; however, a fairly high quality upland mixed forest has become established in one area.

The property was used for various types of agriculture for many years, until purchased by the City of Tallahassee in 1996. Part of the property was purchased to protect a remnant native forest adjacent to Tom Brown Park. This section of the Park contains two listed species of plants in an upland mixed forest dominated by beech and magnolia. Conner Creek divides the Park from Tom Brown Park and flows into the St. Marks River basin. The creek is an area of concentration for privet and tallow.

Species Treated	**Common Name**	**Rank**	**Type**	**Herbicide**
Albizia julibrissin	mimosa	I	BB	TRIE
Ardisia crenata	coral ardisia	I	BB	TRIE
Cinnamomum camphora	camphor tree	I	BB	TRIE
Ligustrum spp.	privet	I	BB	TRIE
Nandina domestica	heavenly bamboo	I	BB	TRIE
Solanum viarum	tropical soda apple	I	BB	TRIE
Triadica sebifera	Chinese tallow	I	BB	TRIE
Melia azedarach	Chinaberry	II	BB	TRIE

Indianhead Park

County: Leon
PCL Size: 28 acres
Project ID: PH-062 28 acres $4,375

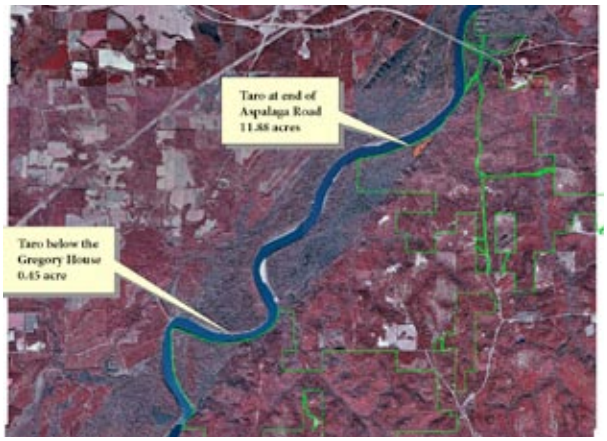
Project Manager: City of Tallahassee Parks and Recreation
Chuck Goodheart, Park Management Specialist
912 Myers Park Drive, Tallahassee, Florida 32303
Phone: 850-933-6631, Fax: 850-891-0959
E-mail: goodheac@talgov.com

Indianhead Park is a 28-acre green space dedicated to the City of Tallahassee in the early 1950s, when the Indianhead neighborhood was developed. Most of the vegetation within the park is old field successional; however, a fairly high quality floodplain/bottomland forest has become established in two areas. A spring fed stream that runs through the green space has been used as a stormwater conveyance for many years. A wide variety of exotic species infested the park, which had been an area of community concern for many years.

Tallahassee has used chemical control to treat kudzu since the early 1980s. In recent years, the area has been grazed by sheep in an effort to obtain kudzu control. This project continued the effort to control kudzu by using chemical treatment following grazing. The entire site is 28 acres divided into 4 treatment zones. Zone 4 is bounded by the Indianhead neighborhood, which is very supportive of this project and is working with adjoining landowners to accomplish exotic species control on private properties.

Species Treated	**Common Name**	**Rank**	**Type**	**Herbicide**
Albizia julibrissin	mimosa	I	BB	TRIE
Ardisia crenata	coral ardisia	I	BB	TRIE
Cinnamomum camphora	camphor tree	I	BB	TRIE
Lygodium japonicum	Japanese climbing fern	I	FL	GLY+MET
Nandina domestica	heavenly bamboo	I	BB	TRIE
Paederia foetida	skunk vine	I	FL	GLY+MET
Pueraria montana	kudzu	I	FL	GLY+MET
Tradescantia fluminensis	tradescantia	I	FL	GLY+MET
Triadica sebifera	Chinese tallow	I	BB	TRIE
Melia azedarach	Chinaberry	II	BB	TRIE

Torreya State Park



County: Liberty
PCL Size: 13,000 acres
Project ID: PH-059 14 acres $7,840

Project Manager: Florida Park Service (DEP)
Mark Ludlow, Park Biologist
2576 NW Torreya Park Road, Bristol, Florida 32321
Phone: 850-643-9343, Fax: 850-643-2987
E-mail: mark.ludlow@dep.state.fl.us

Torreya State Park is located on the east bank of the Apalachicola River. The park consists primarily of riverine floodplain forest, with areas of slope forest and sandhill. The park is home to numerous rare northern U.S. plant species that occur in very few other Florida locations. Exotic vegetation was scattered around the park, but primarily occurred in two areas; approximately 12 acres of abundant wild taro in two sites on the bluff just above the Apalachicola River, and approximately 2 acres with scattered Chinaberry in a "ruderal" area east of the park entrance, along Torreya Park Drive adjacent to the historic Whittaker residence.

Species Treated	Common Name	Rank	Type	Herbicide
Colocasia esculenta	wild taro	I	FL	TRIA
Melia azedarach	Chinaberry	II	CS	TRIA

Wild taro will grow anywhere there is moist ground (even next to your house).

Apalachicola National Forest

County: Liberty, Franklin, Leon, Wakulla
PCL Size: 569,804 acres
Project ID: PH-043 100 acres $57,614

Project Manager: U.S. Forest Service (USDA)
Elizabeth Mizell, Restoration Steward
P.O. Box 579, Bristol, Florida 32321
Phone: 850-643-2282 x1524, Fax: 850-643-2284
E-mail: emizell@tnc.org

The first part of this project addressed infestations scattered across Apalachicola National Forest's two districts, the Apalach and Wakulla, which include Liberty, Leon, and Wakulla Counties. Mimosa, cogon grass, and coral ardisia infestations were relatively small, but numerous, and possessed great potential to become problematic if left untreated. Control operations focused on three areas; ninety-three known infestations of cogon grass concentrated along several Forest Roads; a single one-acre population of coral ardisia at the Fort Gadsden Historic Site in Compartment 108; and significant mimosa populations off Forest Road 115, near Lake Munson, and the Munson Sandhills.

The second part of this project targeted approximately seventy-five acres infested with Japanese climbing fern (JCF) for maintenance control. The project site was the area of the Florida River Island Tract in Compartments 73, 74, and 75. In Compartments 73-75, JCF was present predominately in bottomland hardwoods (floodplain edge), slope forests, and adjacent or disturbed pine flatwoods habitats, such as plantations. Over fifty individual sites have been mapped and treated since control work began. Initial control of JCF began in 2005 and to date has been successful; however, recent severe flooding of the area makes the potential for reinfestation high. The Northwest Florida Water Management District has implemented initial control of JCF on its lands in the Florida River Island area adjacent to this project area. Continued maintenance of USFS lands in this project area reduces the potential for JCF reintroduction, thus increasing the success of the District control efforts and vise-versa.

Species Treated	Common Name	Rank	Type	Herbicide
Albizia julibrissin	mimosa	I	BB	TRIE
Ardisia crenata	coral ardisia	I	FL	GLY
Cinnamomum camphora	camphor tree	I	BB	TRIE
Lygodium japonicum	Japanese climbing fern	I	FL	GLY
Triadica sebifera	Chinese tallow	I	BB	TRIE
Melia azedarach	Chinaberry	II	BB	TRIE

Apalachicola National Forest

Cogon Grass near Forest Road 188 before treatment, September 2006.

Cogon Grass near Forest Road 188 after treatment, October 2007.

Japanese climbing fern along Forest Road 105 before treatment, September 2006.

A dying mimosa tree in the Munson Sandhills after treatment, May 2007.

Eglin Air Force Base

County: Okaloosa, Walton
PCL Size: 463,448 acres
Project ID: PH-054 3 acres $15,000

Project Manager: Eglin AFB Natural Resources
Dennis D. Teague, Endangered Species Biologist
Jackson Guard, 107 Hwy 85 N, Niceville, 32578
Phone: 850-883-1155, Fax: 850-882-5321
E-mail: dennis.teague@eglin.af.mil

Eglin Air Force Base is the largest forested military reservation in the United States. In addition to a large expanse of sandhill, there are 34 other natural communities present, including the most significant array of steephead seepage streams under a single ownership in Florida. There is a suite of rare and sensitive plants in this area that benefit from removal of invasive exotic species, including 67 rare plants and 36 federally or state listed animal species.

The control sites were located on the main base natural areas south of Eglin airfield and north of Choctawhatchee Bay. Pitcher plants are located in many of the areas with mesic soils. The Eglin main base natural areas south of Eglin Parkway have been used for a variety of uses over time but much of it has remained intact in a natural state or has been allowed to return to a natural state.

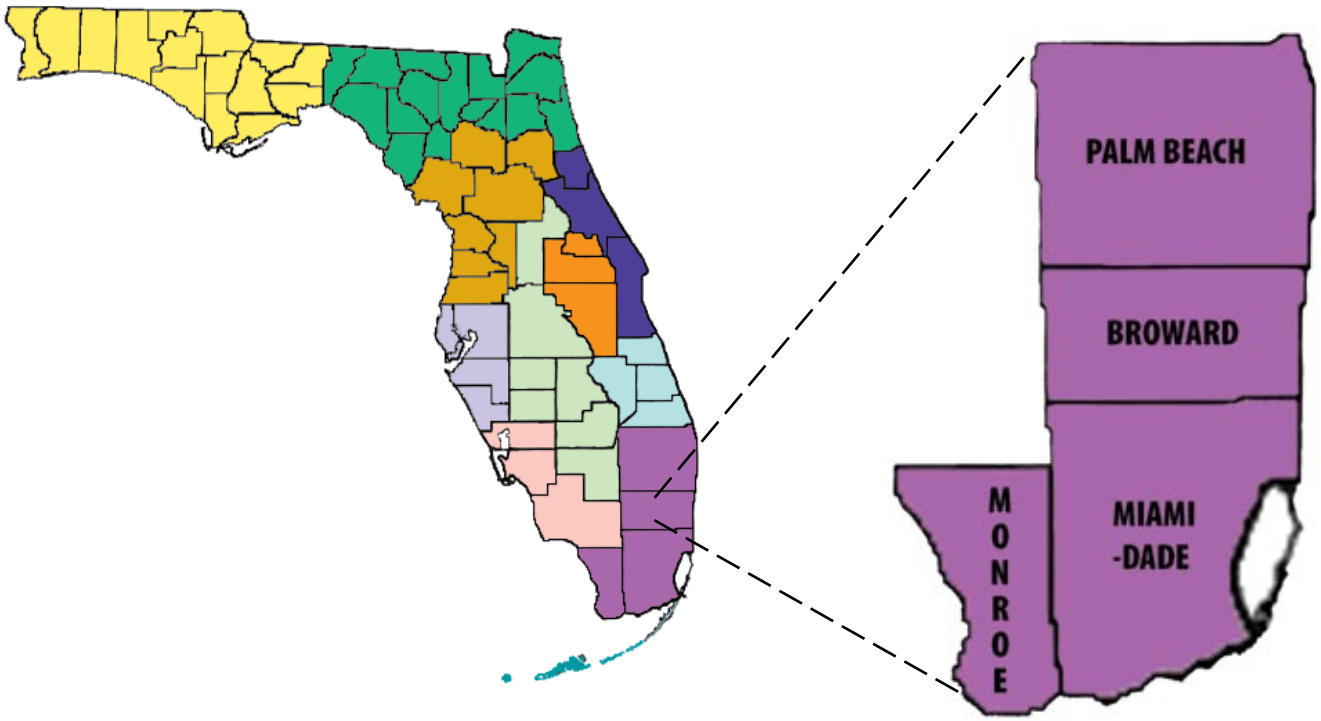
In 1999/2000 an approximately 55 acre area of heavily infested Chinese tallow was treated with BIPM and Air Force funding to remove seed producing Chinese tallow trees and other invasive woody species. Additional treatments were conducted on surrounding areas in 2001/2002. Eglin has since that time used a variety of techniques to manage non-native species in this area.

Additional retreatment efforts were required to remove seedlings and saplings that sprouted from the seed bank of the original infestation. Approximately 100 acres in several different areas were retreated, the majority of which had approximately twenty-five percent coverage of Chinese tallow saplings and seedlings.

The USAF provided $2,732 in matching funds for this project.

Species Treated	Common Name	Rank	Type	Herbicide
Albizia julibrissin	mimosa	I	BB	TRIE
Cinnamomum camphora	camphor tree	I	BB	TRIE
Ligustrum sinense	Chinese privet	I	BB	TRIE
Triadica sebifera	Chinese tallow	I	BB	TRIE
Melia azedarach	Chinaberry	II	BB	TRIE

Southeast Working Group Projects



Hugh Taylor Birch State Park

County: Broward
PCL Size: 175.24 acres
Project ID: SE-131 1 acre $19,740

Project Manager: Florida Park Service (DEP)
Jim Gibson, Park Manager
3109 E. Sunrise Blvd., Ft. Lauderdale, Florida 33304
Phone: 954-468-2791, Fax: 954-762-3737
E-mail: james.gibson@dep.state.fl.us

Australian pines along a roadway are a hazard waiting to happen—waiting for the next hurricane.

Hugh Taylor Birch State Park completed two major mitigation projects that affected almost 55 acres of the park. Goals of these projects included removal of invasive plants and replanting native vegetation. Rare hammock species that exist in the park include Simpson's stopper (*Myrcianthes fragrans*), mahogany (*Swietenia mahagoni*), and leathery prickly ash (*Zanthoxylum coriaceum*). Golden leather fern (*Acrostichum aureum*) occurs in areas threatened by invasives. A sandy open area in the park also contains the federally listed beach jacquemontia (*Jacquemontia reclinata*).

This control project involved mechanical removal of six large Australian pine trees that were deemed a safety hazard for the park.

Species Treated	Common Name	Rank	Type	Herbicide
Casuarina spp.	Australian pine	I	MC	n/a

Deering Estate at Cutler

County: Miami-Dade
PCL Size: 352 acres
Project ID: SE-103 25 acres $75,000

Project Manager: Miami-Dade Park and Recreation
Dallas Hazelton, Environmental Resource Project Supervisor
22200 SW 137 Avenue, Miami, Florida 33170
Phone: 305-257-0933 x237, Fax: 305-257-1086
E-mail: hazeld@miamidade.gov

The 25-acre site known as Deering West historically contained a mix of habitat types, including pine rockland, mesic hammock, hydric hammock, and prairie. Deering West comprises approximately 19 acres of hammock, 6 acres of pineland, and a 3.9-acre remnant slough that divides the property in two. Eight species of native bromeliad (*Tillandsia* spp.) are found in the upper canopy and at least six orchid species, including green-spurred orchid (*Habenaria odontopetala*), also occur in the hammock. Three federally endangered species occur on-site, crenulate leadplant (*Amorpha herbacea* var. *crenulata*), deltoid spurge (*Chamaesyce deltoidea deltoidea*), and tiny polygala (*Polygala smallii*).

The dominant exotics in the hammocks included jasmine, air-potato, and Brazilian pepper. The pine rocklands had some air-potato and scattered jasmine. This project provided for maintenance control of the entire site. Miami-Dade Natural Areas Management personnel conducted all control treatments.

Species Treated	Common Name	Rank	Type	Herbicide
Abrus precatorius	rosary pea	I	CS	TRIE
Albizia lebbeck	woman's tongue	I	CS	TRIE
Ardisia elliptica	shoebutton ardisia	I	CS	TRIE
Bauhinia variegata	orchid tree	I	CS	TRIE
Bischofia javanica	bishopwood	I	CS	TRIE
Dioscorea bulbifera	air-potato	I	CS	TRIE
Eugenia uniflora	Surinam cherry	I	CS	TRIE
Jasminum dichotomum	Gold Coast jasmine	I	CS	TRIE
Jasminum fluminense	Brazilian jasmine	I	CS	TRIE
Manilkara zapota	sapodilla	I	CS	TRIE
Neyraudia reynaudiana	Burma reed	I	CS	TRIE
Schefflera actinophylla	Queensland umbrella tree	I	CS	TRIE
Schinus terebinthifolius	Brazilian pepper	I	CS	TRIE
Tectaria incisa	incised halberd fern	I	CS	TRIE
Tradescantia spathacea	oyster plant	I	CS	TRIE
Adenanthera pavonina	red sandalwood	II	CS	TRIE
Leucaena leucocephala	lead tree	II	CS	TRIE
Ptychosperma elegans	solitary palm	II	CS	TRIE
Sansevieria hyacinthoides	bowstring hemp	II	CS	TRIE
Syngonium podophyllum	arrowhead vine	II	CS	TRIE
Terminalia catappa	tropical almond	II	CS	TRIE

Matheson Hammock Park

County: Miami-Dade
PCL Size: 630 acres
Project ID: SE-108 20 acres $75,000

Project Manager: Miami-Dade Park and Recreation Department
Jane G. Dozier, Environmental Resource Project Supervisor
22200 SW 137 Avenue, Miami, Florida 33170
Phone: 305-257-0933 x243, Fax: 305-257-1086
E-mail: doziej@miamidade.gov

Matheson Hammock Park contains 65 acres of tropical hardwood hammock and transitional oak hammock, as well as 329 acres of marsh, mangrove, and shallow water marine communities. The vegetation consists of a mix of native tropical, temperate, and transitional/pineland plant species. These "islands" are a refuge to many plant species of note, including least halberd fern (*Tectaria fimbriata*), brittle maidenhair fern (*Adiantum tenerum*), and redberry stopper (*Eugena confusa*), as well as the federally endangered crenulate leadplant (*Amorpha herbacea* var. *crenulata*).

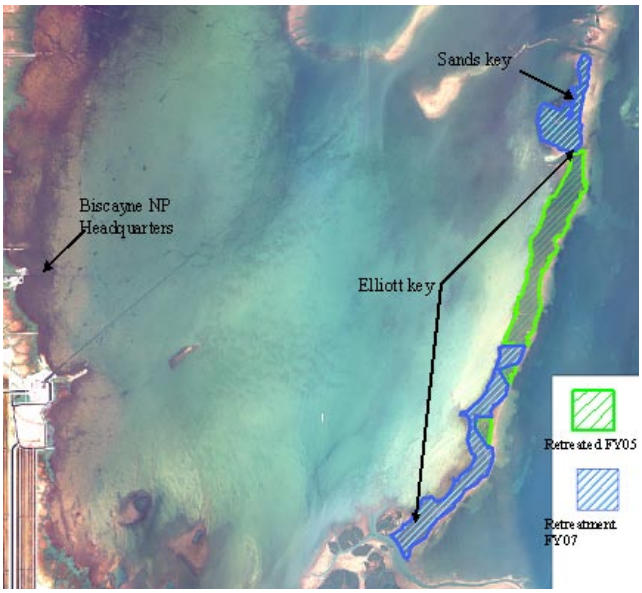
Maintenance control was continued on two areas in the western portion of the park, historically known as "Matheson Nursery," that received previous BIPM funding in FY 2004-2006. The first project area was a 10-acre oak hammock known as "Matheson West." The second project area encompassed two 4-acre tree islands and the 1.7-acre intermediate ecotone. Miami-Dade Natural Areas Management personnel conducted all control treatments for this project. The county provided $16,818 in time and materials as an in-kind match for the project.

Species Treated	Common Name	Rank	Type	Herbicide
Abrus precatorius	rosary pea	I	CS	TRIE
Albizia lebbeck	woman's tongue	I	CS	TRIE
Ardisia elliptica	shoebutton ardisia	I	CS	TRIE
Bauhinia variegata	orchid tree	I	CS	TRIE
Bischofia javanica	bishopwood	I	CS	TRIE
Dioscorea bulbifera	air-potato	I	CS	TRIE
Eugenia uniflora	Surinam cherry	I	CS	TRIE
Jasminum dichotomum	Gold Coast jasmine	I	CS	TRIE
Jasminum fluminense	Brazilian jasmine	I	CS	TRIE
Manilkara zapota	sapodilla	I	CS	TRIE
Neyraudia reynaudiana	Burma reed	I	CS	TRIE
Paederia cruddasiana	sewer vine	I	CS	TRIE
Schefflera actinophylla	umbrella tree	I	CS	TRIE
Schinus terebinthifolius	Brazilian pepper	I	CS	TRIE
Tradescantia fluminensis	tradescantia	I	CS	TRIE
Tradescantia spathacea	oyster plant	I	CS	TRIE
Adenanthera pavonina	red sandalwood	II	CS	TRIE
Epipremnum pinnatum	pothos	II	CS	TRIE
Leucaena leucocephala	lead tree	II	CS	TRIE
Ptychosperma elegans	solitary palm	II	CS	TRIE
Sansevieria hyacinthoides	bowstring hemp	II	CS	TRIE
Syngonium podophyllum	arrowhead vine	II	CS	TRIE
Terminalia catappa	tropical almond	II	CS	TRIE
Alpinia speciosa	shell ginger	n/a	CS	TRIE
Carica papaya	papaya	n/a	CS	TRIE
Carissa macrocarpa	Natal plum	n/a	CS	TRIE
Mangifera indica	mango	n/a	CS	TRIE
Premna odorata	fragrant premna	n/a	CS	TRIE

Biscayne National Park

County: Miami-Dade
PCL Size: 172,924 acres
Project ID: SE-112 1,228 acres $73,062

Project Manager: National Park Service
Shelby Moneysmith
9700 S.W. 328 Street, Homestead, Florida 33033
Phone: 305-230-1144 x3009, Fax: 305-230-1190
E-mail: shelby_moneysmith@nps.gov



The terrestrial areas of Biscayne National Park (BISC) consist of a mainland fringe and approximately forty-two islands or keys. The mainland fringe ranges from subtidal to intertidal from its eastern to central portions and is above the reach of the tides at the western margin (the park boundary). The mainland fringe is primarily red mangrove at its eastern margin, and grades to a red mangrove and buttonwood transitional community towards the western boundary. Where tidal intrusion does not reach the western boundary, the park contains high densities of Brazilian pepper and Australian pine. Black Point Park and Homestead Bayfront Park, which border the mainland fringe, also contain natural areas with high densities of Brazilian pepper, Australian pine, seaside mahoe, Burma reed, and other invasive exotic plants.

On the BISC keys, most of the larger islands, including Elliott Key, have a mangrove fringe with a subtropical hardwood hammock in the interior. The hammock is composed of the typical subtropical hardwood species found in South Florida, such as poisonwood (*Metopium toxiferum*) and pigeon plum (*Cocoloba diversifolia*), as well as a number of state-listed threatened and endangered plants, including West Indian mahogany (*Swietenia mahogani*), satin leaf (*Chrysophyllum oliviforme*), silver palm (*Coccothrinax argentata*), red stopper (*Eugenia rhombea*), and joewood (*Jacquinia keyensis*). Numerous invasive exotic plants, including Brazilian pepper, lather leaf, and Australian pine are negatively impacting the growth, distribution, and ecology of these and other native plants and animals.

The purpose of this project was to continue maintenance control on Elliott and Sands Keys. The entirety of Sands Key was treated in 2000. A volunteer group spent three days re-treating *Colubrina asiatica* on the eastern shoreline of the island in February 2006. There were 423 acres remaining for re-treatment. Elliott Key was initially treated between 2000 to 2003. Re-treatment of the island began on the northeast and northwest portions in 2005, with approximately 805 acres on the south end of the key left to complete. NPS provided a cash match of $34,400 for this project.

Species Treated	Common Name	Rank	Type	Herbicide
Colubrina asiatica	lather leaf	I	CS	TRIA
Manilkara zapota	sapodilla	I	CS	TRIE
Schinus terebinthifolius	Brazilian pepper	I	CS	TRIE
Thespesia populnea	seaside mahoe	I	CS	TRIE

John D. MacArthur Beach State Park

County: Palm Beach
PCL Size: 437 acres
Project ID: SE-085 140 acres $28,000

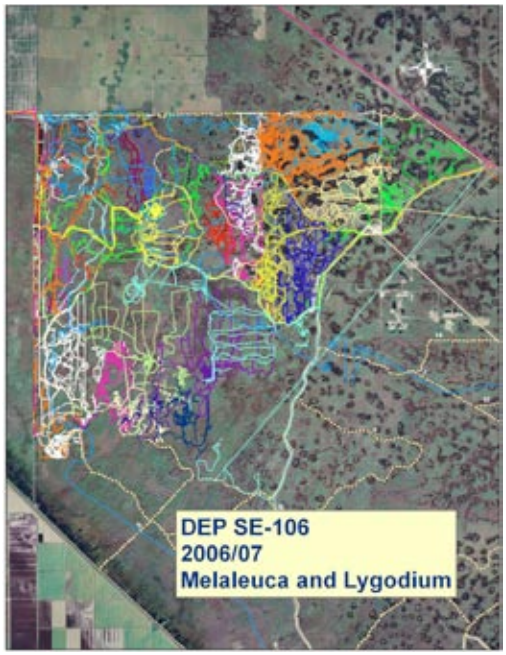
Project Manager: Florida Park Service (DEP)
Terence Coulliette, Park Manager
10900 State Road 703 (A1A), North Palm Beach, Florida 33408
Phone: 561-624 6950, Fax: 561-624 6954
E-mail: terence.coulliette@dep.state.fl.us

MacArthur State Park has many areas of high quality mature hardwood hammock. The largest area of hammock contained the most Brazilian pepper in the park. This hammock contains both tropical hardwood species like satin leaf (*Chrysophyllum oliviforme*) and temperate species like live oak (*Quercus virginiana*). The hammock harbors several threatened and endangered species, including at least nine listed plants.

Brazilian pepper was by far the biggest problem in the park and occurred as isolated individuals and in a few remaining large patches with ninety-five percent coverage. This project eliminated some of the last remaining large patches of pepper from the park. In-house staff treated smaller patches and part of one larger patch as an in-kind match of time and materials.

Species Treated	**Common Name**	**Rank**	**Type**	**Herbicide**
Schinus terebinthifolius	Brazilian pepper	I	CS	TRIE

J.W. Corbett Wildlife Management Area



County: Palm Beach
PCL Size: 60,228 acres

Project ID: SE-104	5,138 acres	$189,825
Project ID: SE-106	32,946 acres	$329,544
Project ID: SE-115		$171,775

Project Manager: Fish and Wildlife Conservation Commission
Linda King, Biological Scientist III
8535 Northlake Boulevard, West Palm Beach, Florida 33412
Phone: 561-624-6989, Fax: 561-624-6988
E-mail: linda.king@myfwc.com

The J.W. Corbett Wildlife Management Area is located in northwestern Palm Beach County and borders the John and Susan H. Dupuis Wildlife and Environmental Area and the John C. and Mariana Jones Hungryland Wildlife and Environmental Area. Natural communities are primarily mesic and wet flatwoods interspersed with depression marshes and wet prairies. Lygodium has been treated both aerially and from the ground over the past 6 years.

The initial control project area encompassed a tract in the central portion of the WMA, which bordered approximately 28,000 acres currently under an FWC contract for control work. Lygodium coverage ranged from sparse up to seventy percent. This exotic fern grows over willow trees (*Salix* spp.), which are used for nesting by the federally endangered snail kite. Corbett contains nesting bald eagles (a federally threatened species) and marks the southeastern most range of the red cockaded woodpecker (RCW), another federally endangered bird species. The Corbett RCW population is small and management of exotic species is necessary to prevent its extirpation from Corbett. The area to be treated contains at least one active bald eagle nest and six active RCW clusters.

The maintenance control project targeted the western portion of the WMA and included acres initially treated for lygodium in 2006. Lygodium coverage was sparse, with small isolated concentrations. Additional acres were treated for melaleuca. FWC provided $318,643 in matching funds for contracted lygodium control, in addition to an in-kind match of $5,400 in time and materials. The BIPM Herbicide Bank provided $171,775 of chemicals for both treatments.

Species Treated	Common Name	Rank	Type	Herbicide
Casuarina spp.	Australian pine	I	CS	TRIE
Lygodium microphyllum	Old World climbing fern	I	FL	GLY
Melaleuca quinquenervia	melaleuca	I	CS	IMZ
Schinus terebinthifolius	Brazilian pepper	I	BB/CS	TRIE
Syzygium cumini	Java plum	I	CS	TRIE

J.W. Corbett WMA

A 500-gallon tank sprayer (top) is used to cover large areas of lygodium with a foliar treatment.

The "poodle" cut used on lygodium.

Loxahatchee National Wildlife Refuge

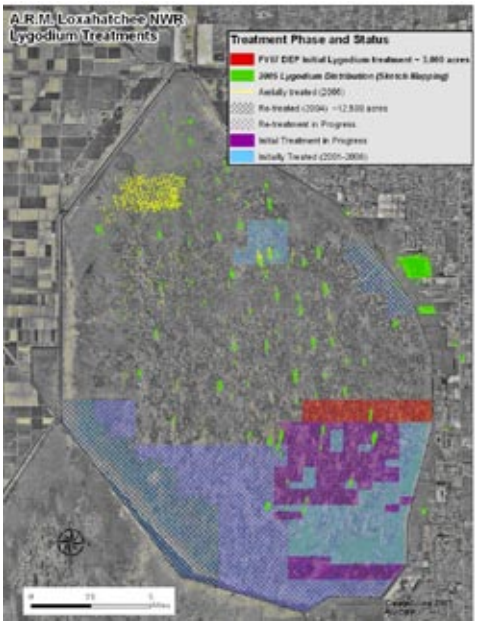
County: Palm Beach
PCL Size: 145,787 acres

Project ID: SE-105	10,000 acres	$2,347,962
Project ID: SE-113	21,869 acres	$1,527,987

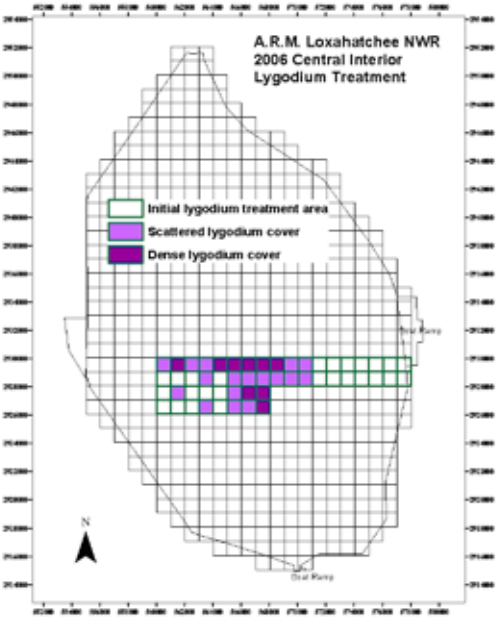
Project Manager: U. S. Fish & Wildlife Service
Gayle Martin
10216 Lee Road, Boynton Beach, Florida 33437
Phone: 561-738-6126, Fax: 561-369-7190
E-mail: Gayle_Martin@fws.gov

A fifty-year license agreement between the Central and Southern Florida Flood Control District (precursor to the South Florida Water Management District) and the U.S. Fish and Wildlife Service in 1951, coupled with the Fish and Wildlife Coordination Act of 1958 and the Migratory Bird Conservation Act of 1929, created the Arthur R. Marshall Loxahatchee National Wildlife Refuge. The Refuge is the only remnant of the northern Everglades in Palm Beach County. The 143,238 acres known as the "refuge interior" (a.k.a. Water Conservation Area 1) is characterized by four interspersed plant communities: slough, wet prairie, sawgrass marsh, and tree island. The Refuge provides critical habitat for nesting wading birds, the endangered Snail kite and Wood stork and the endangered spike ray fern (*Schizaea pennula*), which is found only on the Refuge.

Old World climbing fern affects approximately 63,000 acres of the Refuge. The heaviest infestations are in the northern interior where the vine has overrun tree islands. The first project treated Old World climbing fern on approximately 10,000 acres in the central portion of the Refuge. This area had been treated in 2006 for melaleuca through BIPM funding. Infestation levels in the treatment area ranged from scattered small patches to very dense areas of climbing fern, including some heavily infested tree islands. The second project area fell under the Melaleuca Program and included aerial spraying and ground treatment of melaleuca by water management district contractors.

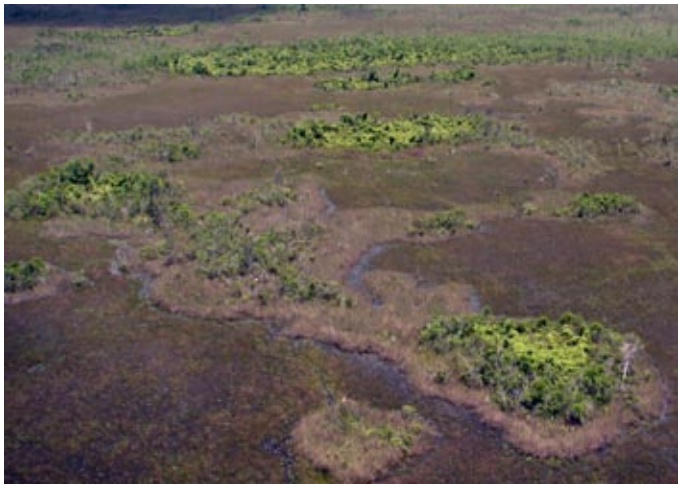


The above map shows the different areas treated for lygodium on the Refuge. The below map shows the mapping process of breaking the control area into treatment blocks that can be located by GIS and tracked over time.



Species Treated	Common Name	Rank	Type	Herbicide
Lygodium microphyllum	Old World climbing fern	I	FL	GLY+MET
Melaleuca quinquenervia	melaleuca	I	CS	GLY+IMZ

Loxahatchee NWR



Above: Lygodium has infested tree islands deep within Loxahatchee.

Right: Melaleuca has been treated on thousands of acres of Loxahatchee.

Loxahatchee Slough Natural Area

County: Palm Beach
PCL Size: 11,000 acres
Project ID: SE-107 796 acres $500,000
Project ID: SE-109 698 acres $200,000

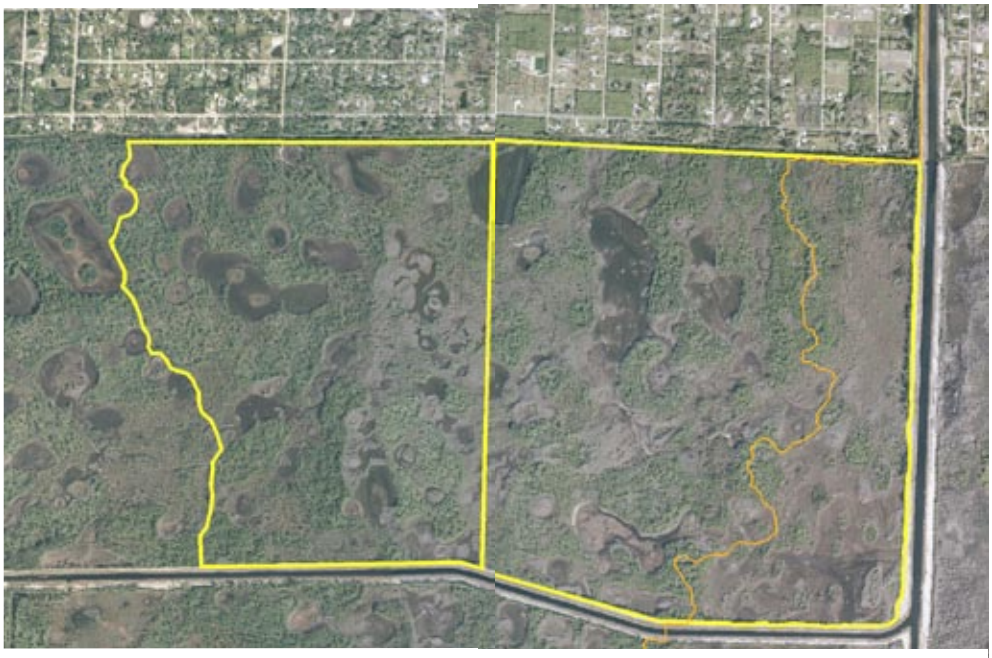
Project Manager: Palm Beach County
Mark Romagosa
3323 Belvedere Road, B-502, West Palm Beach 33406
Phone: 561-233-2481, Fax: 561-233-2414
E-mail: mromagos@co.palm-beach.fl.us

Loxahatchee Slough Natural Area, managed by Palm Beach County Department of Environmental Resources Management, is located in northern Palm Beach County. The site is an integral property for the greenways between Jonathan Dickinson State Park, J.W. Corbett Wildlife Management Area, and the City of West Palm Beach Water Catchment Area. The uplands are predominately composed of mesic and hydric pine flatwoods. Many depression marshes, sloughs, and cypress dome swamps are scattered throughout the site. Water flows under the Beeline Highway, through the Loxahatchee Slough, and eventually drains into the Florida's only federally listed Wild and Scenic River—the Loxahatchee River. Records of listed rare or endangered species at Loxahatchee Slough Natural Area include at least three reptile, nine bird, and twenty-eight plant species.

The first project site was in the east-central portion of the Lucky Tract. The second project was in an area of the Natural Area transected by the northern portion of the Ocean-to-Lake Trail. Melaleuca and Old World climbing fern occurred throughout the project area in every community type, sometimes in near monocultures. Brazilian pepper and Australian pine were present mainly along the north, west, and south perimeters of the project sites, where disturbances occurred in the past. The downy rose-myrtle was lightly scattered throughout the uplands. Palm Beach County contributed matching funds of $94,803 and an in-kind match of $15,700 in time and materials toward the two projects.

Species Treated	**Common Name**	**Rank**	**Type**	**Herbicide**
Acacia auriculiformis	earleaf acacia	I	CS	TRIE+IMZ
Casuarina spp.	Australian pine	I	CS	TRIE+IMZ
Eugenia uniflora	Surinam cherry	I	CS	TRIE+IMZ
Lygodium japonicum	Japanese climbing fern	I	FL	GLY
Lygodium microphyllum	Old World climbing fern	I	FL	GLY
Melaleuca quinquenervia	melaleuca	I	CS	IMZ
Psidium guajava	guava	I	CS	TRIE+IMZ
Rhodomyrtus tomentosa	downy rose-myrtle	I	CS	TRIE+IMZ
Schinus terebinthifolius	Brazilian pepper	I	CS	TRIE+IMZ
Senna pendula	climbing cassia	I	CS	TRIE+IMZ
Ricinus communis	castor bean	II	CS	TRIE+IMZ
Urena lobata	Caesar's weed	II	CS	TRIE+IMZ

Loxahatchee Slough Natural Area



Project areas on Loxahatchee Slough, showing Ocean-to-Lake Trail (orange line) on right.

Pine Glades Natural Area

County: Palm Beach
PCL Size: 6,500 acres

Project ID: SE-110	917 acres	$75,000
Project ID: SE-113	900 acres	$70,415

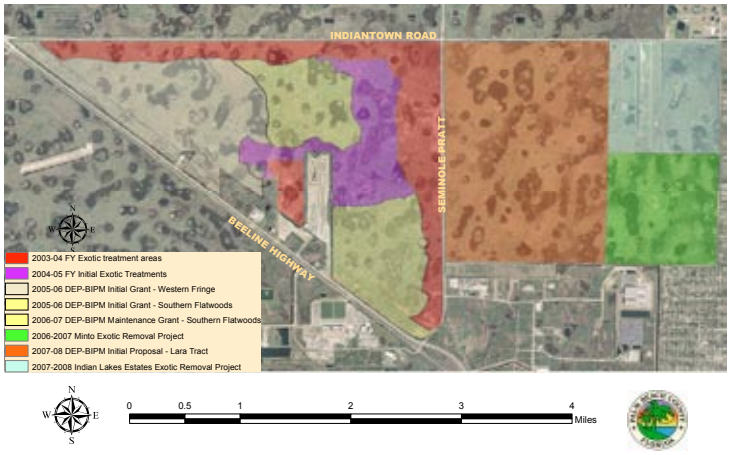
Project Manager: Palm Beach County
Kraig Krum
3323 Belvedere Road, B-502, West Palm Beach 33406
Phone: 561-233-2527, Fax: 561-233-2414
E-mail: kkrum@co.palm-beach.fl.us

Pine Glades Natural Area is an integral property for the greenways between Jonathan Dickinson State Park, J.W. Corbett Wildlife Management Area, and the City of West Palm Beach Water Catchment Area. The project area comprises predominantly mesic and hydric pine flatwoods dominated by slash pine, and freshwater marshes of mostly rushes, with occasional patches of pickerelweed in the deeper areas. Interspersed within these two communities are large areas of wet prairie, small, scattered tree islands less than two acres in size, and disturbed areas where melaleuca has invaded. Water flows through Pine Glades and eventually drains into the Florida's only federally listed Wild and Scenic River—the Loxahatchee River. Records of listed rare or endangered species at Pine Glades include at least three reptile, nine bird, and twenty-eight plant species.

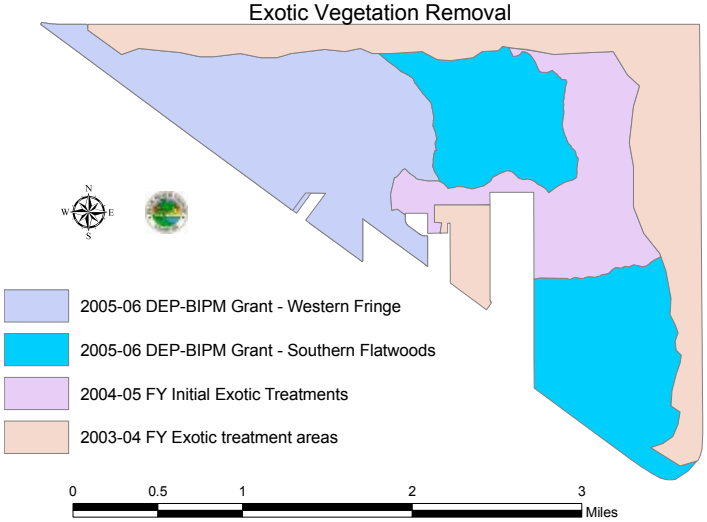
Old World climbing fern was scattered randomly throughout the flatwoods and tree islands on the site. Melaleuca grew predominately in disturbed areas of hydric flatwoods and wet prairies. Brazilian pepper and Australian pine occurred primarily along the perimeter of the site near any disturbed areas. Ground crews began treatment of invasive exotic vegetation at Pine Glades in December 2003 and work is continuing today. BIPM funded two previous projects (Western Fringe and Southern Flatwoods) in Pine Glades. The Western Fringe project was completed in January 2006 and the Southern Flatwoods project was completed in March 2006. The current project provided maintenance control for previously treated areas. Palm Beach County provided $70,953 in matching funds for this project. Control operations were also conducted on the property by the South Florida Water Management District as part of the Melaleuca Program. This work consisted of initial control of melaleuca on 400 acres and maintenance control on 500 acres.

Species Treated	Common Name	Rank	Type	Herbicide
Casuarina spp.	Australian pine	I	CS	TRIE+IMZ
Lygodium microphyllum	Old World climbing fern	I	FL	GLY
Melaleuca quinquenervia	melaleuca	I	CS	IMZ
Schinus terebinthifolius	Brazilian pepper	I	BB	TRIE+IMZ
Syzygium cumini	Java plum	I	BB	TRIE+IMZ

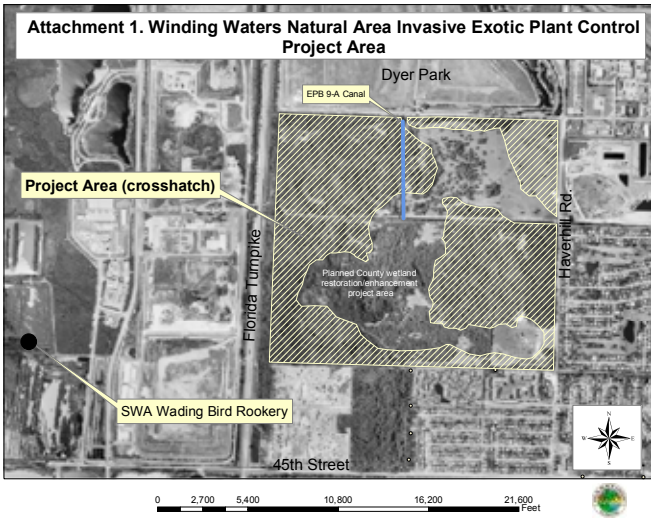
Pine Glades Natural Area
Exotic Vegetation Removal Projects



Pine Glades Natural Area, western tract
Exotic Vegetation Removal



Winding Waters Natural Area



County: Palm Beach
PCL Size: 550 acres
Project ID: SE-111 350 acres $200,000

Project Manager: Palm Beach County
Michael Cheek
3323 Belvedere Road, B-502, West Palm Beach 33406
Phone: 561-233-2466, Fax: 561-233-2414
E-mail: mcheek@co.palm-beach.fl.us

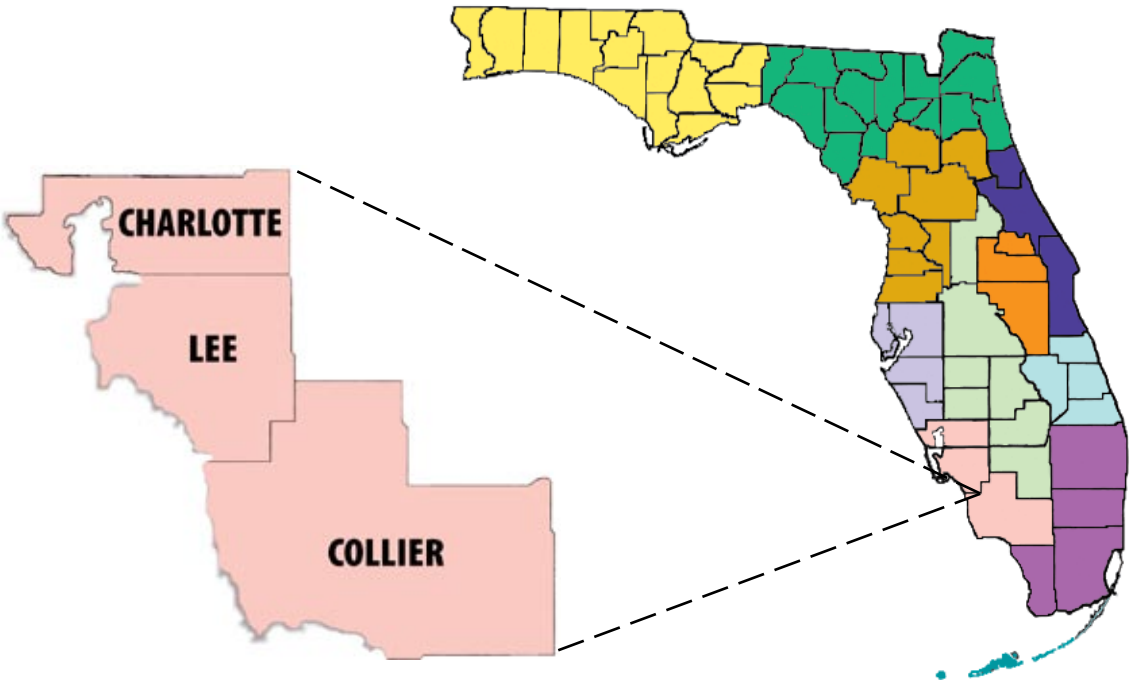
Winding Waters is an integral component of the greenway between the City of West Palm Beach Water Catchment Area and Dyer Park. Rare species recorded at Winding Waters include at least one reptile, twelve birds, and six plants. Disturbed wet prairie comprised the larger project area, with smaller areas of interspersed mesic flatwoods, cypress domes, and prairie hammock. Melaleuca of varying size and density was scattered throughout most of the project area, with the greatest concentration in the disturbed wet prairies.

The mesic flatwoods contained a canopy of slash pine interspersed with melaleuca, Brazilian pepper mixed with native species in the mid-canopy, and a native understory. Brazilian pepper occurred primarily in the old pasture, prairie hammock, and mesic flatwoods, but it also grew in the cypress domes and strands. Australian pine grew along the banks of the northern perimeter canal and the EPB 9-A canal. Old World climbing fern was lightly scattered in cypress domes and strands, mesic flatwoods, and the prairie hammock edges. Earleaf acacia occurred primarily in old pasture in the eastern half of the site.

Palm Beach County contributed matching funds of $453,672 to this project.

Species Treated	Common Name	Rank	Type	Herbicide
Acacia auriculiformis	earleaf acacia	I	BB	TRIE+IMZ
Ardisia elliptica	shoebutton ardisia	I	BB	TRIE+IMZ
Casuarina spp.	Australian pine	I	BB	TRIE+IMZ
Dioscorea bulbifera	air-potato	I	BB	TRIE+IMZ
Lygodium microphyllum	Old World climbing fern	I	FL	GLY
Melaleuca quinquenervia	melaleuca	I	CS	IMZ
Rhodomyrtus tomentosa	downy rose-myrtle	I	BB	TRIE+IMZ
Schinus terebinthifolius	Brazilian pepper	I	BB	TRIE+IMZ
Passiflora biflora	twin-flowered passion vine	II	BB	TRIE+IMZ
Urena lobata	Caesar's weed	II	BB	TRIE+IMZ

Southwest Working Group Projects



Charlotte Flatwoods Park

County: Charlotte
PCL Size: 486 acres
Project ID: SW-101 136 acres $99,780

Project Manager: Charlotte County
Parks, Recreation, and Cultural Resources Department
Tina Powell
2300 El Jobean, Port Charlotte, Florida 33948
Phone: 941-625-7529, Fax: 941-235-3197
E-mail: tina.powell@charlottefl.com

Charlotte Flatwoods Park is contiguous with Babcock-Webb Wildlife Management Area and Charlotte Harbor Preserve State Park, and lies within a larger 18,708-acre area known as the Charlotte Harbor Flatwoods. The park contains 355 acres of pine flatwoods, 65 acres of wet prairie and sloughs, 39 acres of freshwater marsh, and a 27-acre borrow pit.

The county purchased the property to restore native plant communities and to provide outdoor recreation, such as hiking. Melaleuca was scattered throughout the park, with thicker stands at the edges of the park near the interface with roads. The county provided $5,000 in matching funds.

Species Treated	Common Name	Rank	Type	Herbicide
Melaleuca quinquenervia	melaleuca	I	CS/FL	IMZ±GLY

Lots of melaleuca seedlings (left), which can be treated by a foliar application of imazapyr and glyphosate. Larger stems are typically treated by a cut-stump application (right) of imazapyr, with or without glyphosate, depending upon the site conditions. A marker dye is used so workers can easily tell from day to day which plants have already been treated.

Oyster Creek Environmental Park

County: Charlotte
PCL Size: 135 acres
Project ID: SW-110 9 acres $13,800

Project Manager: Charlotte County
Parks, Recreation, and Cultural Resources Department
Tina Powell
2300 El Jobean, Port Charlotte, Florida 33948
Phone: 941-625-7529, Fax: 941-235-3197
E-mail: tina.powell@charlottefl.com

The county acquired Oyster Creek Environmental Park with funds from the Florida Communities Trust. The park contains approximately 127 acres of scrubby pine flatwoods, 3 acres of mangrove swamp, 2 acres of cabbage palm and laurel oak hammock, 2 acres of streams and waterways, less than one acre of salt marsh, and a less than one acre borrow pit. The project site is located adjacent to two existing county-owned conservation lands and within a larger greenway waterway corridor known as the Oyster Creek, Lemon Bay Aquatic Preserve, Ainger Creek waterway.

Species Treated	Common Name	Rank	Type	Herbicide
Abrus precatorius	rosary pea	I	BB	TRIE
Melia azedarach	Chinaberry	I	BB	TRIE
Dioscorea bulbifera	air-potato	I	FL	GLY
Imperata cylindrica	cogon grass	I	FL	GLY
Lantana camara	lantana	I	BB	TRIE
Schinus terebinthifolius	Brazilian pepper	I	BB	TRIE
Urena lobata	Caesar's weed	II	BB	TRIE

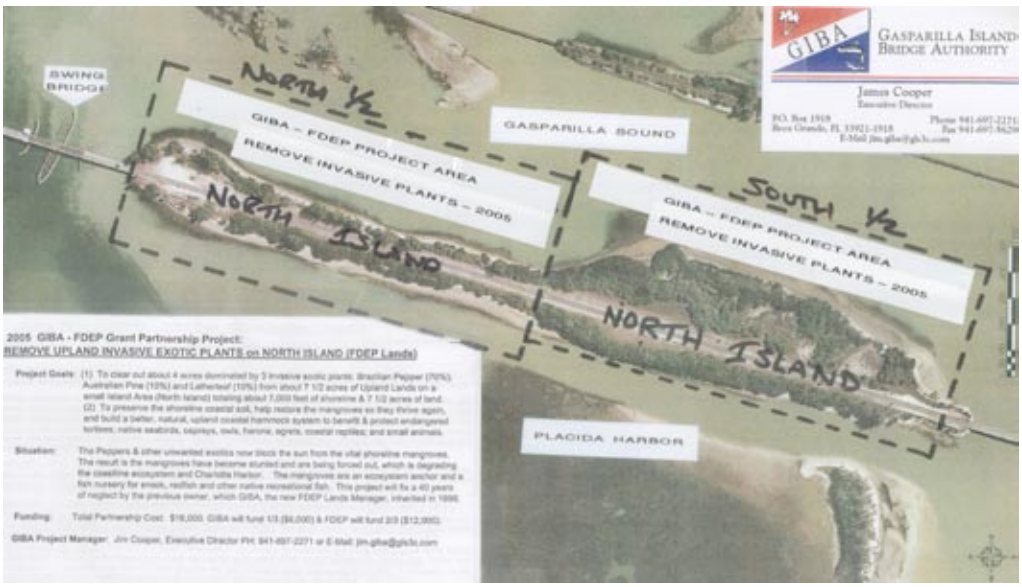
North Island

County: Charlotte
PCL Size: 11.5 acres
Project ID: SW-077 9 acres $26,650

Project Manager: Gasparilla Island Bridge Authority
Jim Cooper, Executive Director
PO Box 1918, Boca Grande, Florida 33921
Phone: 941-697-2271, Fax: 941-697-5629
E-mail: jim.giba@gls3c.com

North Island was created from dredge spoil during 1952 to 1956. It lies in Charlotte Harbor between Gasparilla Sound and Placida Harbor. The island is part of the Boca Grande Causeway System. The 0.7-mile long island has 5,000 feet of mangrove shoreline and 11.5 acres of coastal hammock. About seventy percent of the hammock was invaded by Brazilian pepper and other exotic plants. BIPM also provided $1,900 of chemicals for maintenance from its Herbicide Bank.

Species Treated	Common Name	Rank	Type	Herbicide
Casuarina spp.	Australian pine	I	MC	TRIE
Colubrina asiatica	lather leaf	I	MC	TRIE
Schinus terebinthifolius	Brazilian pepper	I	MC	TRIE



Big Cypress National Preserve

County: Collier, Miami-Dade
PCL Size: 729,000 acres

Project ID: SW-075	7,410 acres	$98,292
Project ID: SW-076	1,489 acres	$261,630

Project Manager: National Park Service
James N. Burch, PhD.
HCR 61 Box 10, Ochopee, Florida 34139
Phone: 941-695-1111, Fax: 941-695-3493
E-mail: jim_burch@nps.gov

Two projects were conducted at Big Cypress National Preserve (BICY). The first provided maintenance control of melaleuca in the Loop Unit of BICY, which was previously treated in the 2005 fiscal year. The eastern portion of the Loop Unit is mostly dwarf cypress habitat with extensive areas of prairie, while the western area is predominately cypress strand (Gator Hook Swamp). Pine islands and hardwood hammocks punctuate the entire Loop Unit.

The second BICY project targeted Brazilian pepper in the 21,000-acre "Addition Lands" north of I-75. This part of BICY is more elevated than the southern area, and therefore is more mesic. Biological communities in this area are more commonly pine and palmetto flatwoods, or hardwood and sabal palm hammocks with hydric communities common throughout. Hydrological changes and recreational activities have altered much of the mesic area. The degree of alteration varies from relatively minor change in rangeland to severe alteration in intensively farmed areas.

Disturbance of the mesic communities allowed many non-native plants to become established, of which the most significant was Brazilian pepper. Nearly monocultural stands developed in areas with much disturbance, and even areas with less disturbance had significant populations of this invasive plant. This project was a continuation of pepper removal started in 2005.

Species Treated	Common Name	Rank	Type	Herbicide
Melaleuca quinquenervia	melaleuca	I	CS	IMZ+GLY
Schinus terebinthifolius	Brazilian pepper	I	BB	TRIE

Picayune Strand State Forest

County: Collier
PCL Size: 65,436 acres

Project ID: SW-081	2,838 acres	$743,533
Project ID: SW-082	3,010 acres	$651,531
Project ID: SW-091	239 acres	$80,796

Project Manager: Division of Forestry (DACS)
Amanda Peck
2121 52nd Ave SE, Naples, Florida 34117
Phone: 239-348-7557, Fax: 239-348-7559
E-mail: pecka@doacs.state.fl.us

Picayune Strand State Forest is comprised of two adjacent tracts, South Golden Gate Estates to the east and Belle Meade to the west. The forest is bordered to the east by Fakahatchee State Preserve and to the south by Collier-Seminole State Park and Ten Thousand Islands National Wildlife Refuge. The forest encompasses a wide variety of habitats, including cypress sloughs, pine flatwoods, palm hammocks, and grass prairies. The rare hand fern (*Ophioglossum palmatum*) has been found on sabal palms within the area.

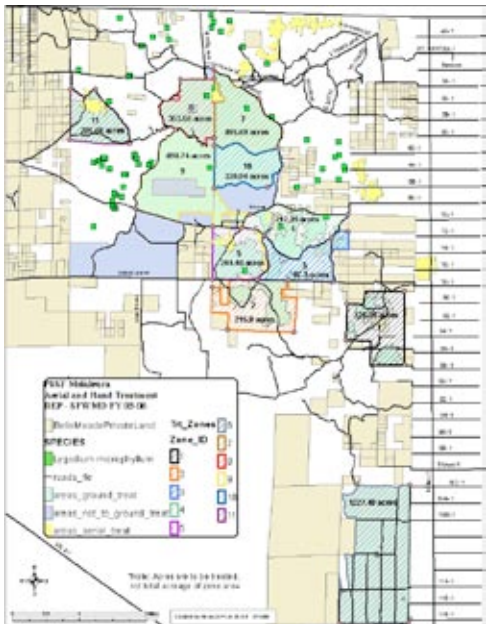
The first project targeted melaleuca only and was located in the northwest South Golden Gate Estates tract, adjacent to the southern border of the National Panther Refuge. This area is primarily wet prairie, dry prairie, and pine flatwoods, with moderate remaining native canopy. Native ground cover had decreased due to shading and competition of resources with melaleuca and other invasive plants. This large project area was divided into ten zones that were split between two private contractors.

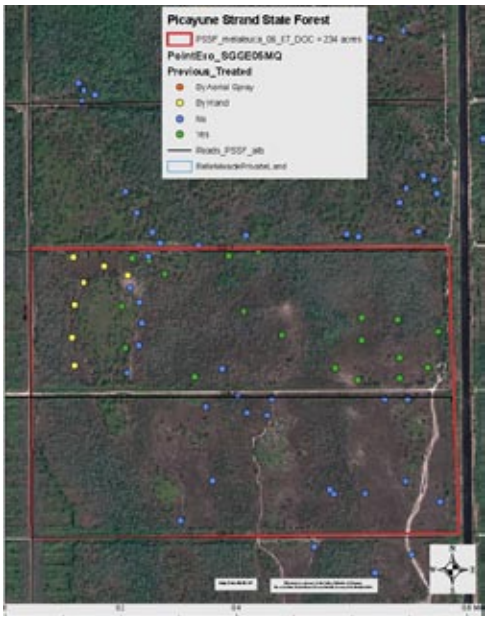
The second project lay within the southernmost portion of the Belle Meade tract, adjacent to the northern boundary of Collier Seminole State Park. This project area was near a large group of rare epiphytes that includes two state endangered species, ghost orchid (*Dendrophylax lindenii*) and umbelled orchid (*Epidendrum floridense*). DOF surveyed this 1000-acre area and located approximately 3 acres of high-density infestation, with climbing fern reaching canopy levels, and approximately 91 acres of low-density, widely scattered patches. Several small infestations of *L. microphyllum* and *L japonicum* were also found within South Golden Gate Estates. These smaller infestations were controlled in-house by DOF. BIPM project costs included $61,755 in chemicals form the Herbicide bank. DOF provided $20,000 in matching funds for this project.

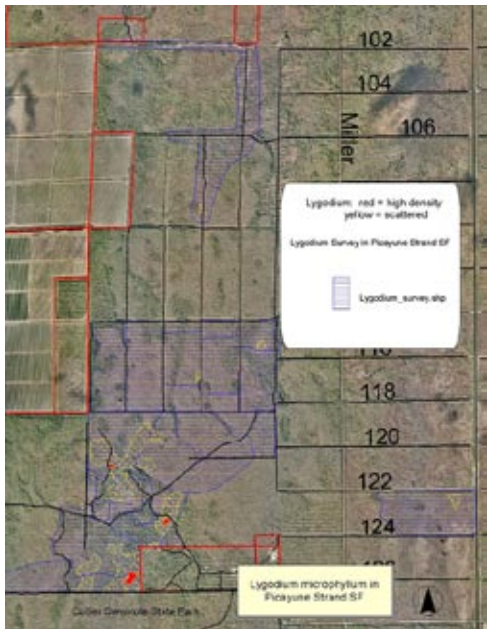
The third project targeted *Lygodium* only, in an area of South Golden Gate Estates where it had been surveyed in 2004. Some populations of the fern were very dense by this time (see picture above).

Species Treated	Common Name	Rank	Type	Herbicide
Lygodium japonicum	Japanese climbing fern	I	FL	GLY+MET
Lygodium microphyllum	Old World climbing fern	I	FL	GLY+MET
Melaleuca quinquenervia	melaleuca	I	CS	GLY+IMZ
Schinus terebinthifolius	Brazilian pepper	I	CS	GLY+IMZ

Picayune Strand State Forest





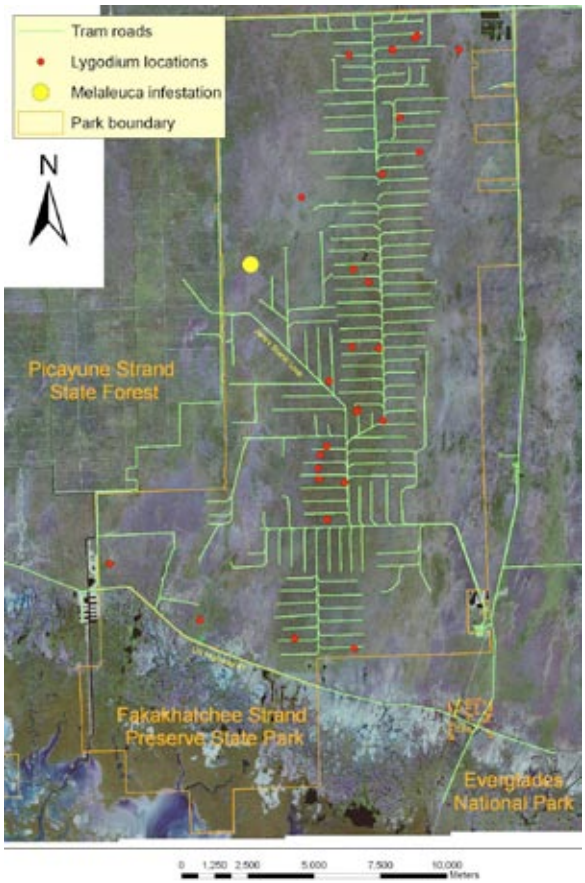


Right: Closeups of the nefarious fern.

Fakahatchee Strand Preserve State Park

County: Collier
PCL Size: 70,376 acres
Project ID: SW-089 300 acres $122,582

Project Manager: Florida Park Service (DEP)
Mike Owen
PO Box 548, Copeland, Florida 34137
Phone: 239-695-2886, Fax: 239-695-4947
E-mail: mike.owen@dep.state.fl.us



Fakahatchee Strand Preserve State Park is located southeast of Naples and spans approximately 30 miles north to south, from Interstate I-75 to Gullivan Bay in the Gulf of Mexico. Florida Panther National Wildlife Refuge shares a six-mile long border along I-75 in the north, Big Cypress National Preserve and State Road 29 define most of the preserve's eastern border, and Picayune Strand State Forest and the Prairie Canal define the western border. Ten Thousand Islands National Wildlife Refuge and Everglades National Park border the Preserve to the South.

The project targeted approximately 50 acres of melaleuca and 28 acres of lygodium within the Preserve, and Brazilian pepper along the border with the Florida Panther refuge. The lygodium infestations were fairly small, but widespread and difficult to access, and primarily occurred in strand swamp forest. Because lygodium vines grow vertically and trellis up beyond the reach of a pump sprayer, older infestations have to be "poodle cut" as high as possible and sprayed thoroughly for good herbicide absorption.

Florida Panther National Wildlife Refuge is located on the north side of Interstate 75, with Fakahatchee Strand State Preserve opposite on the south side. The east boundary of both is at the intersection of SR 29 and I-75. The project site ran parallel to I-75 on the north and south sides for nine miles. The treatment area started adjacent to the Interstate right-of-way and extended approximately 1000 yards to the south and 300 yards to the north. This part of the project was a retreatment of about 200 acres of Brazilian pepper that initially treated in 2003.

Species Treated	Common Name	Rank	Type	Herbicide
Lygodium microphyllum	Old World climbing fern	I	FL	GLY+MET
Melaleuca quinquenervia	melaleuca	I	CS	GLY+IMZ
Schinus terebinthifolius	Brazilian pepper	I	BB	TRIE

Fakahatchee Strand Preserve

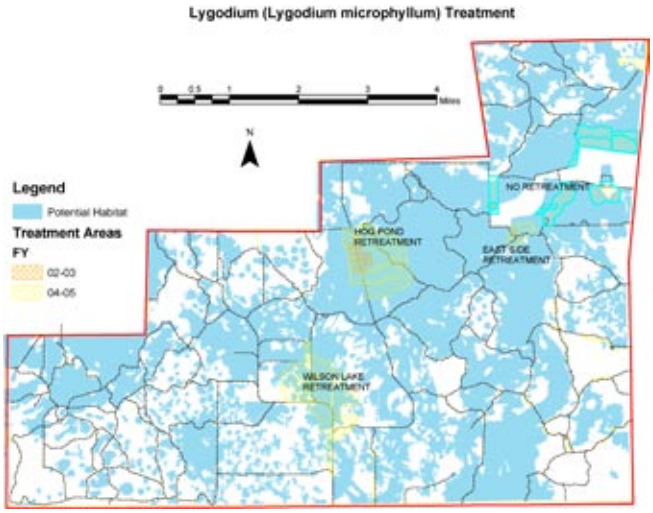
Rare plants and wide open vistas draw thousands of visitors to Fakahatchee Strand.

The “swamp buggy” will get you into the deepest wettest areas of a project–wherever invasives hide.

Florida Panther National Wildlife Refuge

County: Collier
PCL Size: 26,529 acres
Project ID: SW-092 2,544 acres $60,571

Project Manager: U.S. Fish and Wildlife Service
Takako Hashimoto
13233 State Road 29 S, Immokalee, Florida 34142
Phone: 239-253-7015
E-mail: takako_hashimoto@fws.gov



The Panther Refuge is comprised of a mixture of natural communities that includes pine flatwoods, hardwood hammocks, wet prairies, cypress swamp and strand, and mixed swamp forests. An estimated 2000 acres of the Refuge was affected by lygodium at varying densities and levels of infestation. Larger infestations occurred in the Hog Pond and Wilson Lake areas of the Refuge. Previous treatments were conducted during 2002 and 2004 around Hog Pond, which was established as a release site for the lygodium moth, a biological control agent.

Infestations occurred primarily in cypress forest and mixed swamp communities, where disturbance caused by canal digging and railroad tram building related to timber extraction occurred in the mid-1900s. Cattle grazing and fire also factored into the spread of this species. The USFWS contributed toward this project $30,000 in matching funds and an in-kind contribution of time and vehicles estimated at $10,000.

Species Treated	Common Name	Rank	Type	Herbicide
Lygodium microphyllum	Old World climbing fern	I	FL	GLY+MET

Railhead Scrub Preserve

County: Collier
PCL Size: 80 acres
Project ID: SW-106 13.5 acres $50,600

Project Manager: Collier Facilities Management Department
Melissa Hennig, Environmental Specialist
3301 Tamiami Trail East, Naples, Florida 34112
Phone: 239-213-2957, Fax: 239-793-3795
E-mail: MelissaHennig@colliergov.net

Although a large majority of the Railhead Scrub Preserve is xeric oak scrub habitat, the target area consisted of hydric pine flatwoods and pine flatwoods. The target area was 13.5 acres and was heavily infested with melaleuca. Melaleuca within Area 1 was mechanically mulched using a Brontosaurus mower.

Species Treated	Common Name	Rank	Type	Herbicide
Melaleuca quinquenervia	melaleuca	I	MC/CS	None

Logan Woods Preserve

County: Collier
PCL Size: 5.69 acres
Project ID: SW-107 5.25 acres $34,400

Project Manager: Collier Environmental Services
Christal Segura, Environmental Specialist
2800 North Horseshoe Drive, Naples, Florida 34104
Phone: 239-403-2495, Fax: 239-213-2960
E-mail: christalsegura@colliergov.net

The Logan Woods Preserve (formerly known as the McIntosh property) is located within the urban boundary of Collier County and consists of two contiguous parcels located at the NW corner of the intersection of Pine Ridge Road and Logan Boulevard. The property consists of hydric hammock heavily infested with melaleuca. The melaleuca was removed with a Brontosaurus mower.

Species Treated	Common Name	Rank	Type	Herbicide
Melaleuca quinquenervia	melaleuca	I	MC	n/a


Logan Blvd. Before


Logan Blvd. After

Caloosahatchee Creek Preserve

County: Lee
PCL Size: 1,290 acres
Project ID: SW-084 100 acres $121,608

Project Manager: Lee County Parks and Recreation
Jeff Anderson, Conservation 20/20 Land Steward
3410 Palm Beach Boulevard, Fort Myers, Florida 33916
Phone: 239-461-7455, Fax: 239-461-7460
E-mail: janderson@leegov.com

The Preserve is located on the north side of the Caloosahatchee River and next to the Caloosahatchee National Wildlife Refuge. The project area was comprised of the southern portion of two management units. Half of the area of the management units was dredge spoil invaded by Brazilian pepper and Australian pine. The other half of the area was wetlands infested by Brazilian pepper. Brazilian pepper primarily occurred in a fringe along the shoreline of the creek.

Species Treated	Common Name	Rank	Type	Herbicide
Schinus terebinthifolius	Brazilian pepper	I	MC	n/a

Pop Ash Creek Preserve

County: Lee
PCL Size: 307 acres
Project ID: SW-099 284 acres $261,680

Project Manager: Lee County Parks and Recreation
Cathy Olson, Conservation 20/20 Senior Supervisor
3410 Palm Beach Boulevard, Fort Myers, Florida 33916
Phone: 239-461-7455, Fax: 239-461-7460
E-mail: colson@leegov.com

Pop Ash Creek Preserve consists of six management units with melaleuca as the dominant invasive species throughout. Melaleuca occurred in a range from dense monocultures to scattered saplings. The project area encompassed all of units 1-5 and a small portion of unit 6. Natural communities include mesic flatwoods, wet flatwoods, wet prairie, hydric hammock, and a blackwater stream.

A $16,000 grant from the Charlotte Harbor National Estuary Program funded all melaleuca treatment within portions of units 2 and 3, and provided matching funds for the control work on the remaining acres of the project area. In units 2, 3, and 6, contractors used heavy equipment in the mesic and wet flatwoods to mulch the large melaleuca trees down to grade.

Species Treated	Common Name	Rank	Type	Herbicide
Melaleuca quinquenervia	melaleuca	I	MC/CS	IMZ

Prairie Pines Preserve

County: Lee
PCL Size: 2,709 acres
Project ID: SW-098 590 acres $453,321

Project Manager: Lee County Parks and Recreation
Cathy Olson, Conservation 20/20 Senior Supervisor
3410 Palm Beach Boulevard, Fort Myers, Florida 33916
Phone: 239-461-7455, Fax: 239-461-7460
E-mail: colson@leegov.com

Prairie Pines is the second largest preserve in Lee County. Over four hundred species of native plants are documented on the site, including seven listed plant species. The preserve is divided into nineteen management units. The project area consisted of Management Units 14, 15, 18, and 19. Natural communities in the project area include of mesic flatwoods, wet flatwoods, and depression marsh. The majority of the flatwoods have an infestation of fifty to seventy-five percent mature melaleuca. The depression marsh is ringed by a melaleuca monoculture that is beginning to invade the center of the marsh. Three adjacent Management Units were treated with BIPM funds in 2004 and retreated with Conservation 20/20 funds in 2005.

Species Treated	**Common Name**	**Rank**	**Type**	**Herbicide**
Melaleuca quinquenervia	melaleuca	I	MC	n/a

Before...

...during...

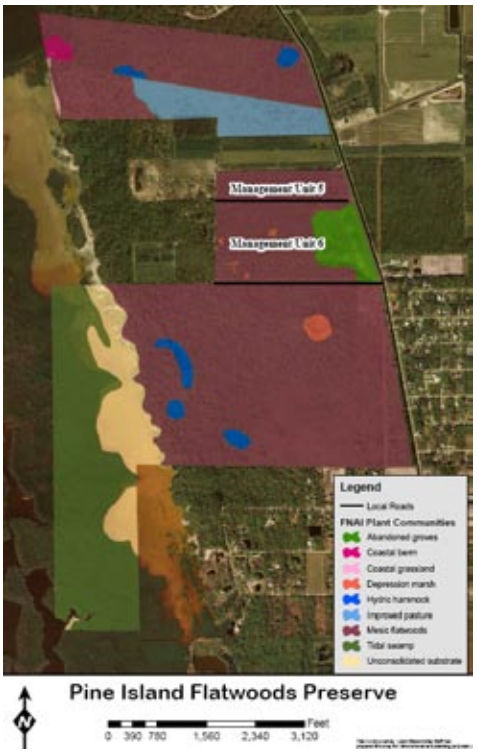
...and after control operations.

Pine Island Flatwoods Preserve

County: Lee
PCL Size: 525 acres
Project ID: SW-103 75 acres $26,250

Project Manager: Lee County Parks and Recreation
Jeff Anderson, Conservation 20/20 Land Steward
3410 Palm Beach Boulevard, Fort Myers, Florida 33916
Phone: 239-461-7455, Fax: 239-461-7460
E-mail: janderson@leegov.com

Pine Island Flatwoods Preserve consists of twelve management units. Melaleuca occurred in several dense stands and scattered throughout the preserve. The project area consisted of manual treatment of melaleuca in portions of management units 5 and 6. The predominant natural community within the project area is mesic flatwoods. The management units within the project area had melaleuca densities that ranged from mature dense monocultures to saplings with less than twenty-five percent coverage.



Species Treated	Common Name	Rank	Type	Herbicide
Melaleuca quinquenervia	melaleuca	I	CS	TRIE
Schinus terebinthifolius	Brazilian pepper	I	CS/FL	TRIE/GLY

Gator Hole Preserve

County: Lee
PCL Size: 175 acres
Project ID: SW-109 96 acres $43,200

Project Manager: Lee County Parks and Recreation
Jeff Anderson, Conservation 20/20 Land Steward
3410 Palm Beach Boulevard, Fort Myers, Florida 33916
Phone: 239-461-7455, Fax: 239-461-7460
E-mail: janderson@leegov.com

Gator Hole Preserve consists of seven management units. Melaleuca occurred in several dense stands and scattered throughout the preserve. The project consisted of manual treatment of all melaleuca, except for those areas where mechanical treatment is scheduled for the following fiscal year. Natural communities within the project area include mesic flatwoods, wet flatwoods, wet prairie, and dome swamp. The management units within the project area had melaleuca densities that ranged from mature dense monocultures to saplings with less than twenty-five percent coverage.

Species Treated	Common Name	Rank	Type	Herbicide
Melaleuca quinquenervia	melaleuca	I	CS	TRIE

Corkscrew Wellfield

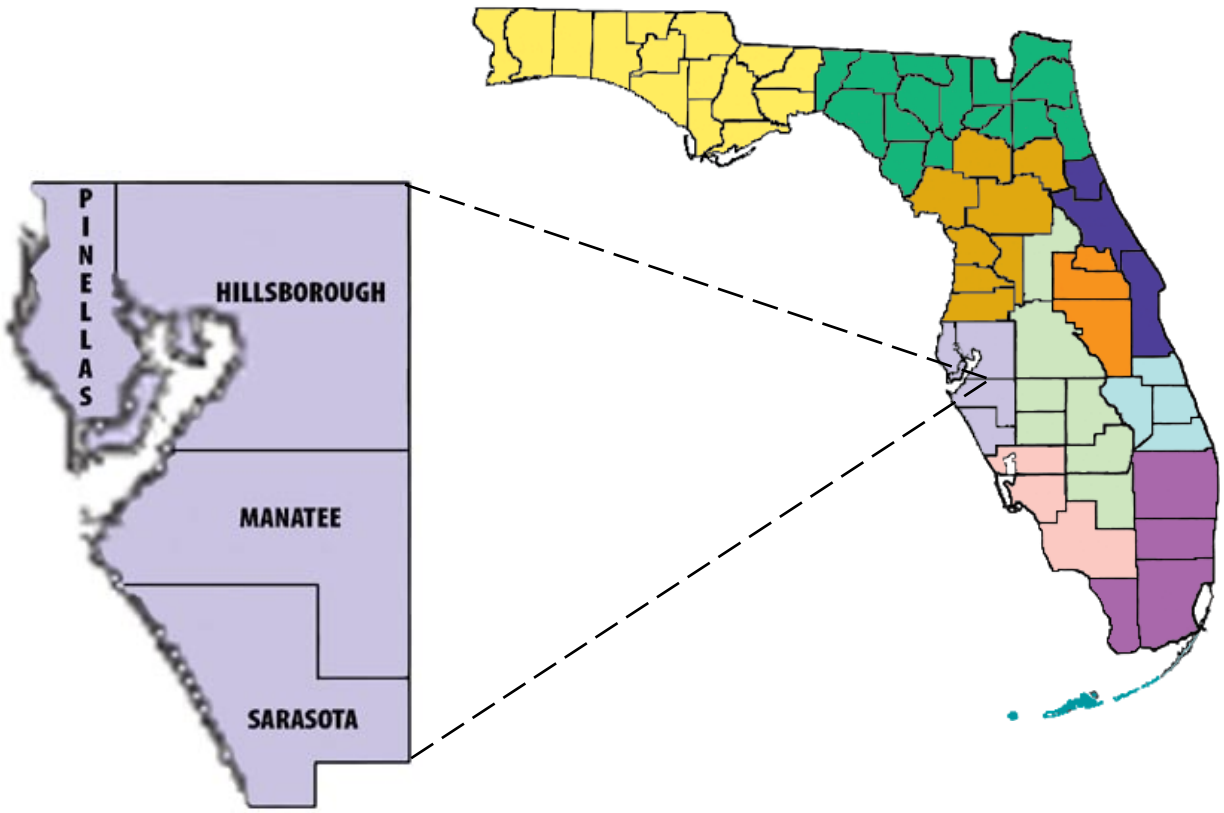
County: Lee
PCL Size: 476 acres
Project ID: SW-118 145 acres $56,526

Project Manager: Lee County Parks and Recreation
Roger Clark
3410 Palm Beach Boulevard, Fort Myers, Florida 33916
Phone: 239-461-7453, Fax: 239-461-7460
E-mail: roger@leegov.com

Corkscrew Wellfield serves as a critical connector to adjacent conservation lands, including the Imperial Marsh Preserve and the Corkscrew Regional Ecosystem Watershed. Melaleuca was targeted in the pine flatwoods and cypress swamp areas of the wellfield.

Species Treated	Common Name	Rank	Type	Herbicide
Melaleuca quinquenervia	melaleuca	I	CS	GLY

Sun Coast Working Group Projects



Rocky Creek Nature Preserve

County: Hillsborough
PCL Size: 325 acres
Project ID: SC-073 250 acres $33,371

Project Manager: Hillsborough County
Richard Sullivan
3709 Gulf City Road, Ruskin, Florida 33579
Phone: 813-671-7754, Fax: 813-671-7758
E-mail: sullivanr@hillsboroughcounty.org

The Rocky Creek Nature Preserve is one of the few undeveloped parcels remaining along Upper Tampa Bay. Habitats on Rocky Creek are mostly wetlands comprising mangrove swamps, salt marshes, salterns, and a freshwater black rush and leather fern marsh. The uplands consist of low-lying coastal hammocks dominated by live oak, cabbage palm, and slash pine.

This project supported the ongoing effort to remove invasive plants found on natural preserve land acquired through Hillsborough County's Environmental Lands Acquisition and Protection Program. The project removed remaining and re-sprouting invasive nuisance plants, specifically Brazilian pepper, Australian pine, lead tree, and punk tree, which were initially treated by BIPM contractors in the previous fiscal year. Retreatment of the areas is necessary to ensure full control of the infestations. The initial treatment efforts were largely successful in controlling the invasive species. There are remaining pockets of infestation but overall the natives are flourishing. A high native seed source is available, and additional plantings of native species have not been necessary.

The Southwest Florida Water Management District's Surface Water Improvement and Management Program has provided restoration consultation and funding. Other partners include the Florida Department of Environmental Protection and the Hillsborough County Environmental Protection Commission. Hillsborough County provided an in-kind match of $45,198 in time and materials.

Species Treated	Common Name	Rank	Type	Herbicide
Casuarina equisetifolia	Australian pine	I	BB	TRIE
Melaleuca quinquenervia	melaleuca	I	BB/FL	TRIE/IMZ+GLY
Schinus terebinthifolius	Brazilian pepper	I	BB/FL	TRIE/IMZ+GLY
Triadica sebifera	Chinese tallow	I	BB	TRIE
Leucaena leucocephala	lead tree	II	BB	TRIE

Little Manatee River Nature Preserve

County: Hillsborough
PCL Size: 1,900 acres
Project ID: SC-081 1,900 acres $44,176

Project Manager: Hillsborough County
Ross Dickerson, Environmental Specialist
3709 Gulf City Road, Ruskin, Florida 33579
Phone: 813-671-7754, Fax: 813-671-7758
E-mail: dickersonr@hillsboroughcounty.org

The Little Manatee River Nature Preserve surrounds Interstate 75 where it crosses the Little Manatee River and it borders Little Manatee River State Park. The nature preserve is one of several natural areas found along the river. The county acquired the property in the early 1990s, due to its relatively pristine condition and because it provides an important wildlife corridor along the Little Manatee River. The site encompasses many natural communities including pine flatwoods, scrubby flatwoods, dry prairie, sand pine scrub, coastal hammock, wetland forest, and herbaceous wetlands. Invasive plants occurred scattered throughout the site with medium density.

The county provided $100,000 in matching funds from mitigation funding through the Southwest Florida Water Management District and provided in-kind services for this phase of the project. This work continued an ongoing partnership effort by the District's Surface Water Improvement and Management Program, the Florida Department of Environmental Protection, and the Hillsborough County Environmental Protection Commission.

Species Treated	Common Name	Rank	Type	Herbicide
Imperata cylindrica	cogon grass	I	FL	GLY+IMZ
Schinus terebinthifolius	Brazilian pepper	I	BB	TRIE

Alafia River State Park

County: Hillsborough
PCL Size: 6,186 acres
Project ID: SC-082 320 acres $79,207

Project Manager: Florida Park Service (DEP)
Craig Liney, Park Manager
14326 County Road 39 South, Lithia, Florida 33547
Phone: 813-672-5320, Fax: 813-672-5225
E-mail: craig.liney@dep.state.fl.us

Alafia River State Park consists of 5,159 upland acres and 1,027 acres of wetlands or waterbodies. Before acquisition by the state, the property was a phosphate mine called the Lonesome Mine, named after the nearby community of Fort Lonesome. The community was named after a frontier outpost of the US Army that occupied the site during the Third Seminole War. The land includes part of the Alafia River Corridor Save Our Rivers Project. The Alafia River Corridor Nature Preserve also abuts the park property. The South Prong of the Alafia River flows thru the center of the park property. The park features both natural and cultural resources. The park currently consists of sixteen miles of mountain biking trails and twenty miles of equestrian and hiking trails. Recreational activities also include camping, picnicking, and fishing.

The park engages in the removal of invasive exotic plants using a combination of several techniques that involve volunteers, Americorps, community service workers, and park staff. The park enlists help from the local community through the PARKnership program, monthly Exotic Removal Weekends, Boy and Girl Scout Service projects, public educational programs, planting projects, partnerships, and grant opportunities. The Florida Park Service provided an in-kind match of $62,717 in time, equipment, and materials.

Species Treated	**Common Name**	**Rank**	**Type**	**Herbicide**
Abrus precatorius	rosary pea	I	FL	GLY+MET
Colocasia esculenta	wild taro	I	FL	GLY+MET
Dioscorea bulbifera	air-potato	I	FL	GLY±MET
Imperata cylindrica	cogon grass	I	FL	GLY±IMZ
Lantana camara	lantana	I	BB/FL	TRIE/GLY±IMZ
Lygodium japonicum	Japanese climbing fern	I	FL	GLY±MET±IMZ
Paederia foetida	skunk vine	I	FL	GLY±MET
Schinus terebinthifolius	Brazilian pepper	I	BB	TRIE
Solanum viarum	tropical soda apple	I	FL	GLY±MET±IMZ
Melia azedarach	Chinaberry	II	BB	TRIE
Melinis repens	Natal grass	II	FL	GLY±IMZ
Sphagneticola trilobata	wedelia	II	FL	GLY+MET
Urena lobata	Caesar's weed	II	FL	GLY±MET±IMZ
Momordica charantia	balsampear	n/a	FL	GLY±MET±IMZ

Alafia River State Park

As if invasive plants were not enough of a problem, rooting by feral pigs (left) disturbs the ground and gives plant invaders a ready foothold.

Hillsborough River State Park

County: Hillsborough
PCL Size: 3,383 acres
Project ID: SC-084 650 acres $69,156

Project Manager: Florida Park Service (DEP)
Greg Toppin, Park Manager
15402 US 301 North, Thonotosassa, Florida 33592
Phone: 813-987-6870, Fax: 813-987-6773
E-mail: greg.toppin@dep.state.fl.us

Hillsborough River State Park is a part of the Heritage Rivers GEOpark complex located in northern Hillsborough County. The Park is one of the earliest parks in Florida, created in 1934 by the Civil Conservation Corps. The Park features both natural and cultural resources. The Hillsborough River flows over a limestone outcrop, creating one of the few rapids in the state. A hammock of live oak, sabal palm, magnolia, and hickory trees borders the river. Cypress swamps, pine flatwoods, and marshes make up most of the remaining acreage.

Air-potato arrived in the park around 1980 and spread rapidly along the park drive, although persistent control efforts have reduced the area it once occupied. Skunk vine and Japanese climbing fern arrived more recently, but spread rapidly into trees and also formed a dense ground cover. Tropical soda apple primarily spread in the former improved pastures on the Model Dairy property. Cogon grass spread along roadways, with the potential to move into pastures, old mining areas, forested land, and recreational areas. This project involved maintenance control of areas previously treated through the Uplands Program.

Target Plant	Common Name	Rank	Type	Herbicide
Ardisia crenata	coral ardisia	I	CS	TRIE
Cinnamomum camphora	camphor tree	I	CS	TRIE
Dioscorea bulbifera	air-potato	I	FL	GLY+MET
Imperata cylindrica	cogon grass	I	FL	GLY±MET
Lantana camara	lantana	I	CS/FL	TRIE/GLY+MET
Lygodium japonicum	Japanese climbing fern	I	FL	GLY+MET
Paederia foetida	skunk vine	I	FL	GLY+MET
Solanum viarum	tropical soda apple	I	CS/FL	TRIE/GLY+MET
Triadica sebifera	Chinese tallow	I	CS/FL	TRIE/GLY+MET[1]
Melia azedarach	Chinaberry	II	CS	TRIE
Xanthosoma sagittifolium	elephant ear	II	CS/FL	TRIE/GLY+MET
Crotalaria spectabilis	showy rattlebox	n/a	FL	GLY+MET

[1]seedlings only

Terra Ceia Preserve State Park

County: Hillsborough
PCL Size: 1,400 acres

Project ID: SC-085	58 acres	$85,900
Project ID: SC-099	121 acres	$12,539

Project Manager: Florida Park Service (DEP)
Stephen D. Raymond, Environmental Scientist I
130 Terra Ceia Road, Terra Ceia, Florida 34250
Phone: 941-721-2068, Fax: 941-721-2070
E-mail: stephen.raymond@dep.state.fl.us

Terra Ceia Preserve State Park (TCP) is located on the southeastern shore of Tampa Bay in northwest Manatee County. Several rare plants such as Florida golden aster (*Chrysopsis floridana*), Tampa vervain (*Glandularia tampensis*), and hand fern (*Ophioglossum palmatum*) occur on TCP. Large areas of the preserve show the effect of past agriculture practices. Fallow fields that once were slash pine and mesic flatwoods or maritime hammocks, more recently were dominated by Brazilian pepper and other invasive exotic species.

Much of Terra Ceia is included in a Surface Water Improvement and Management (SWIM) restoration project being conducted by the Southwest Florida Water Management District. The invasive plant control projects are coordinated with the SWIM project. Matching funds in the amount of $135,000 were provided through the SWIM Program.

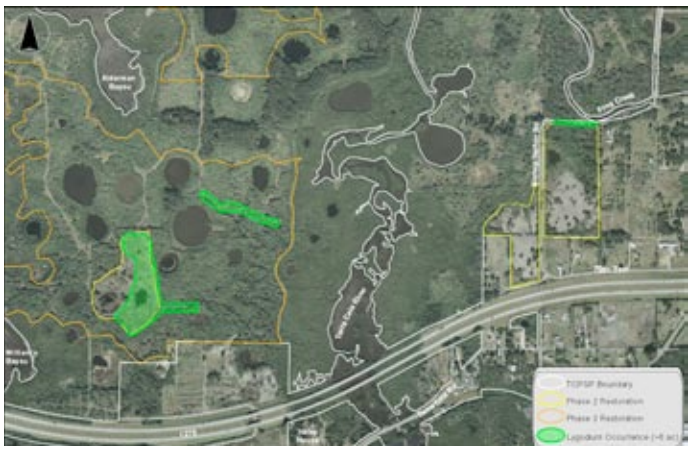
The first of two project areas consisted of three treatment sites with an area totaling approximately 42 acres located in the south central and southeastern region of the preserve. Invasive species reestablished in this completed phase of the SWIM restoration project. Coverage of invasive species at these sites averaged seventy to eighty percent. A lygodium infestation within the project area was approximately 16 acres in size with coverage of five to fifteen percent.

The second project consisted largely of maintenance control on two sites with an acreage totaling approximately 121 acres located in the northeast corner of the preserve. Coverage of these previously treated areas averaged twenty to thirty percent. Untreated areas within the maintenance project totaled approximately 17 acres with a coverage of eighty to ninety percent. An area of lygodium infestation within the project area was approximately 3 acres in size with coverage of five to fifteen percent.

Species Treated	Common Name	Rank	Type	Herbicide
Albizia julibrissin	mimosa	I	BB/CS	TRIE
Cinnamomum camphora	camphor tree	I	BB/CS	TRIE
Colocasia esculenta	wild taro	I	FL	GLY
Cupaniopsis anacardioides	carrotwood	I	BB/CS	TRIE
Dioscorea bulbifera	air-potato	I	FL	GLY
Imperata cylindrica	cogon grass	I	FL	GLY
Lantana camara	lantana	I	BB/FL	TRIE/GLY
Lygodium japonicum	Japanese climbing fern	I	FL	GLY
Paederia foetida	skunk vine	I	FL	GLY

Terra Ceia Preserve State Park

Species Treated	Common Name	Rank	Type	Herbicide
Schinus terebinthifolius	Brazilian pepper	I	BB/CS	TRIE
Melia azedarach	Chinaberry	II	BB/CS	TRIE
Panicum maximum	Guinea grass	II	FL	GLY
Ricinus communis	castor bean	II	BB/CS	TRIE
Syagrus romanzoffiana	queen palm	II	BB/CS	TRIE
Urena lobata	Caesar's weed	II	FL	GLY
Asclepias curassavica	scarlet milkweed	n/a	FL	GLY



McKay Creek Greenway

County: Pinellas
PCL Size: 88 acres
Project ID: SC-058 64 acres $14,295

Site Manager: Pinellas County Park Department
Deborah J. Chayet, Grants Specialist
631 Chestnut Street, Clearwater, Florida 33756
Phone: 727-464-5111, Fax: 727-464-3379
E-mail: dchayet@co.pinellas.fl.us

The McKay Creek Greenway is a contiguous corridor of over four miles that includes large parklands, conservation lands, and other Pinellas County owned properties. The project area includes approximately 88 acres of land used for passive recreation, environmental education, and wetland preservation. Additional acreage in the project lies adjacent to both sides of McKay Creek. Extensive wetland restoration in the project area transformed the creek from a straight-line, fast flowing ditch into a more natural, slightly meandering water body. Large wetland restoration and mitigation areas were developed along the sides of the creek.

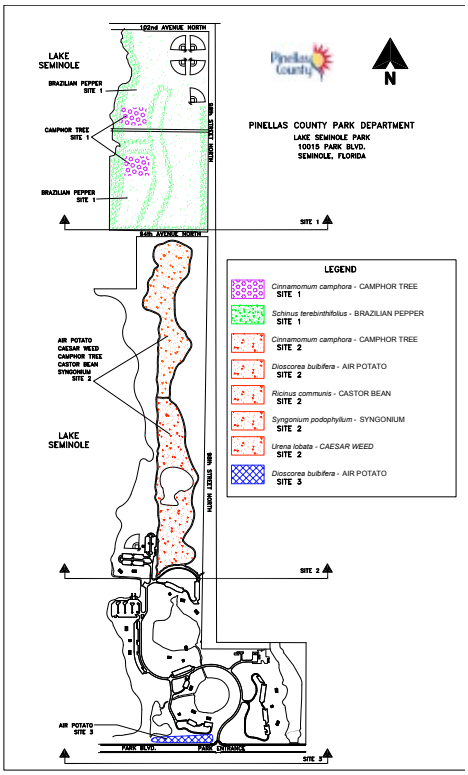
Approximately 55 acres of the total project area was infested at a mostly light to moderate level. Cogon grass was localized in three small pockets covering less than one-half of an acre. Japanese climbing fern with light density covered approximately 3.5 acres. Brazilian pepper was scattered in light densities along site perimeters and densely along the northern side of the creek. Camphor trees were lightly scattered over a broad area. More than one species infested some areas. The project area comprised seven control sites ranging from 0.5-25 acres in size with thirty to eighty percent coverage. Pinellas County provided $7,600 in matching funds and $50,541 of time and materials as an in-kind match for this project.

Species Treated	Common Name	Rank	Type	Herbicide
Dioscorea bulbifera	air-potato	I	FL	GLY/TRIA
Imperata cylindrica	cogon grass	I	FL	GLY
Schinus terebinthifolius	Brazilian pepper	I	BB/CS	TRIE/GLY+IMZ
Triadica sebifera	Chinese tallow	I	BB	TRIE

Lake Seminole Park

County: Pinellas
PCL Size: 255 acres
Project ID: SC-077 162 acres $11,494

Site Manager: Pinellas County Park Department
Deborah J. Chayet, Grants Specialist
631 Chestnut Street, Clearwater, Florida 33756
Phone: 727-464-5111, Fax: 727-464-3379
E-mail: dchayet@co.pinellas.fl.us

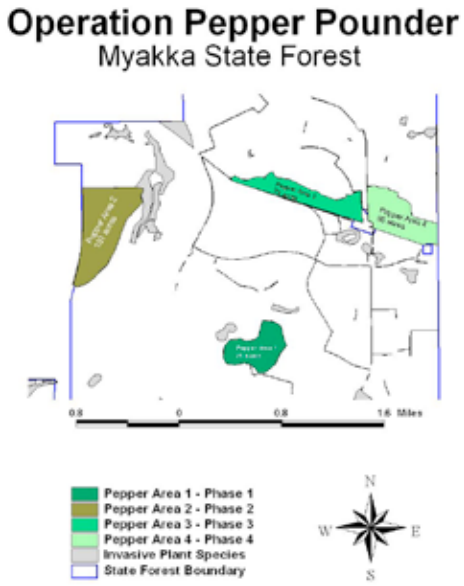


Lake Seminole Park is located in central Pinellas County and provides passive recreation for over one million visitors each year. Natural communities in the park include pine flatwoods, bayheads, and wetlands transitioning into mesic hammock. Also present are small areas of mangroves near the southern border of the park. The priority of the original project was Brazilian pepper and air-potato, with over 100 acres cleared of these two species. This project provided maintenance control on areas treated in previous years. Invasive species varied from less than one percent up to twenty-five percent coverage.

Species Treated	Common Name	Rank	Type	Herbicide
Cinnamomum camphora	camphor tree	I	BB	TRIE
Colocasia esculenta	wild taro	I	FL	GLY+MET
Cupaniopsis anacardioides	carrotwood	I	BB	TRIE
Dioscorea bulbifera	air-potato	I	FL	GLY+MET
Lantana camara	lantanas	I	BB	TRIE
Melaleuca quinquenervia	melaleuca	I	BB	TRIE
Schinus terebinthifolius	Brazilian pepper	I	BB	TRIE
Triadica sebifera	Chinese tallow	I	BB	TRIE
Leucaena leucocephala	lead tree	II	BB	TRIE
Melia azedarach	Chinaberry	II	BB	TRIE
Panicum maximum	Guinea grass	II	FL	GLY+MET
Ricinus communis	castor bean	II	BB	TRIE
Sphagneticola trilobata	wedelia	II	FL	GLY+MET
Urena lobata	Caesar's weed	II	BB	TRIE

Lake Seminole Park

Myakka State Forest

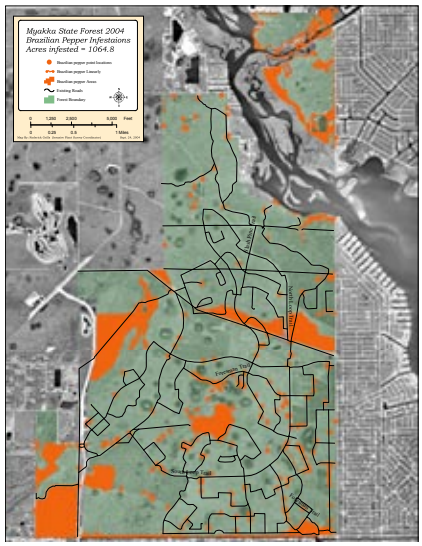


County: Sarasota
PCL Size: 8,653 acres
Project ID: SC-071 472 acres $33,146

Project Manager: Division of Forestry (DACS)
Tom Williams, Senior Forester
PO Box 399, Englewood, Florida 34295-0399
Phone: 941-255-7653, Fax: 941-255-7654
E-mail: williat@doacs.state.fl.us

The Myakka State Forest (MSF) is divided into three main tracts, one located east of the Myakka River and two located west of the Myakka River. The Myakka River is an Outstanding Florida Water and a state Wild and Scenic River. The state-threatened yellow-flowered butterwort (*Pinguicula lutea*) occurs on the site.

This project targeted the main tract on the west side of the river. MSF has identified and mapped 27 exotic, invasive plant species within its borders. The number one threat to the MSF is Brazilian pepper, which occupies a large portion of the forest (twelve percent of the total forest area). Contractors treated pepper in the 75-acre Area I, which had coverage of fifty-one to seventy-five percent. In-house staff treated all of the dispersed, outlying pepper trees on approximately 150 acres around the treatment area.



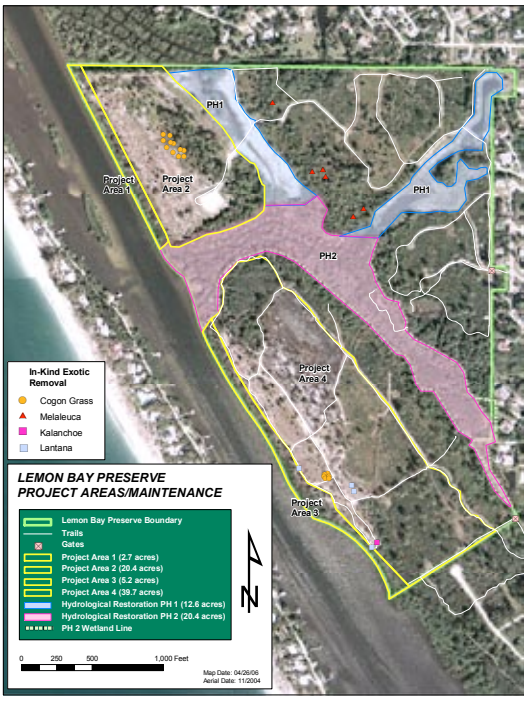
Pepper Pounder Phase I attacked the forest area with some of the heaviest infestation. The other areas (Phase II, III, & IV) range from six to fifty percent pepper density and will be treated in future years. The infestations primarily occur on improved pasture scattered throughout the property, but pepper has also been observed spreading outward into the mesic flatwoods, depression marshes, and other surrounding intact natural areas. The Forest Health section of the Division of Forestry provided $35,000 in matching funds for this project.

Species Treated	Common Name	Rank	Type	Herbicide
Schinus terebinthifolius	Brazilian pepper	I	CS	TRIE

Lemon Bay Preserve

County: Sarasota
PCL Size: 165 acres
Project ID: SC-079 135 acres $17,600

Project Manager: Sarasota County Natural Resources
Nancy Edmondson, Environmental Specialist
2817 Cattlemen Road, Sarasota, Florida 34232
Phone: 941-861-6260, Fax: 941-861-6266
E-mail: nedmonds@scgov.net



Sarasota County owns 785 acres along the shores of the Lemon Bay Aquatic Preserve in upper Lemon Bay. The 165-acre Lemon Bay Preserve is part of a protection priority site in the Environmentally Sensitive Lands Protection Program. The Preserve contains coastal oak scrub, scrubby flatwoods, pine flatwoods, mixed cabbage palm hammock, mangrove swamps, tidal marsh, and palmetto prairie. Coastal oak scrub and palmetto prairie are rare and imperiled habitats in Florida. Lemon Bay Preserve is home to eighteen listed species, including Curtis' milkweed (*Asclepias curtissii*) and coontie (*Zamia floridana*).

Ruderal areas are a result of dredging the Gulf Intracoastal Waterway (ICW) in the 1960s and the depositing of spoil material in historic mangrove and coastal scrub communities. Although the site contains Brazilian pepper scattered throughout the property, this project targeted the trees invading the mangrove fringe along approximately 0.85 mile of Lemon Bay and the adjacent ruderal areas. Coverage of invasive species varied from two to ten percent.

Sarasota County provided $12,000 in matching funds and in-kind services of time and materials worth $3,037.

Species Treated	Common Name	Rank	Type	Herbicide
Abrus precatorius	rosary pea	I	BB/FL	TRIE/GLY+MET
Asparagus aethiopicus	asparagus-fern	I	BB	TRIE
Cupaniopsis anacardioides	carrotwood	I	BB	TRIE
Ficus spp.	fig tree	I	BB	TRIE
Lantana camara	lantana	I	BB	TRIE
Melaleuca quinquenervia	melaleuca	I	CS	IMZ
Schinus terebinthifolius	Brazilian pepper	I	BB/CS	TRIE/IMZ
Vitex trifolia	simple-leaf chaste tree	II	BB	TRIE
Washingtonia robusta	Washington fan palm	II	BB	TRIE
Momordica charantia	balsampear	n/a	FL	GLY+MET

Oscar Scherer State Park

County: Sarasota
PCL Size: 1,382 acres
Project ID: SC-087 211 acres $7,792

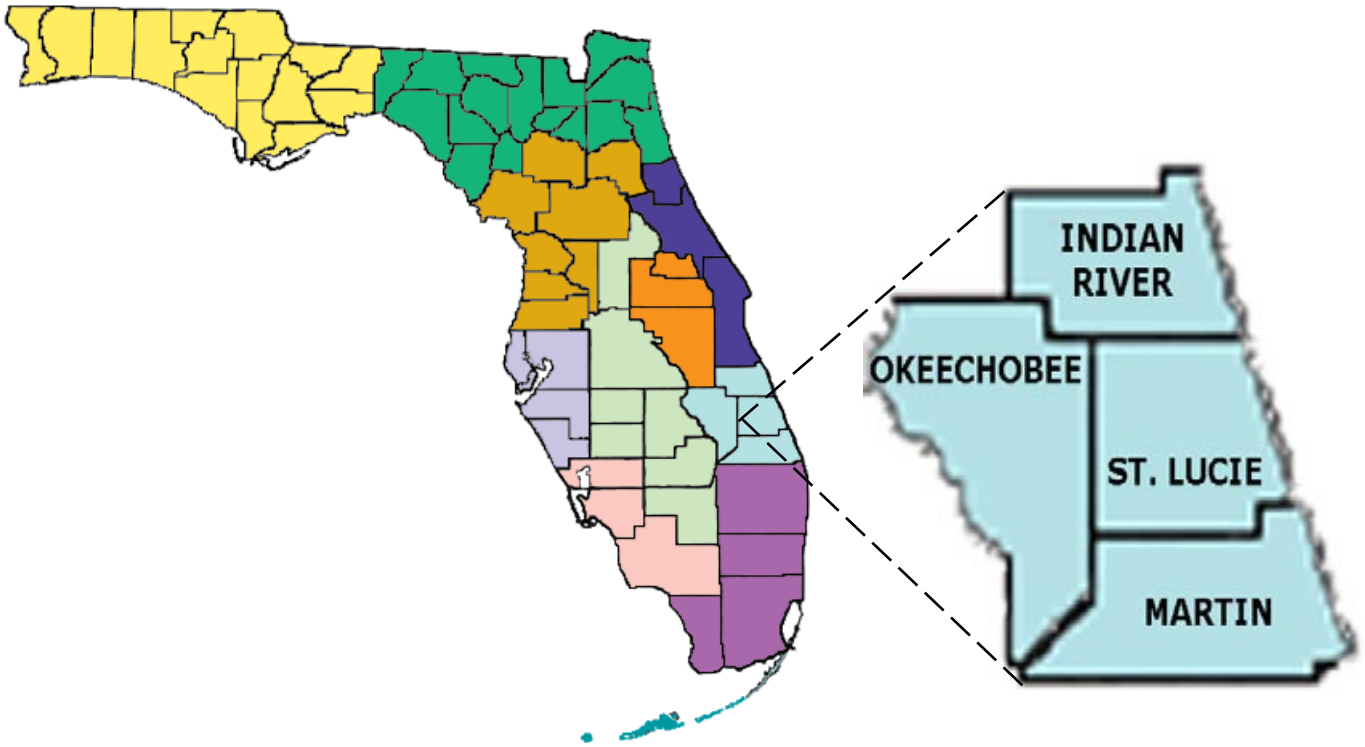
Project Manager: Florida Park Service (DEP)
Tony Clements, Assistant Park Manager
1843 S. Tamiami Trail, Osprey, Florida 34229
Phone: 941-483-5957
E-mail: tony.clements@dep.state.fl.us

The project area is located within Oscar Scherer State Park along a Rails-to-Trails corridor that is approximately two miles long and one hundred feet wide. The rails-to-trails section within the park is only a portion of the 12.4-mile corridor of old train rails owned by Sarasota County. The trail itself is 16 feet wide, with the remaining 84 feet as a right of way buffer along the trail, which has recently been opened to allow foot and bike traffic. The land surrounding the elevated track line is highly disturbed both on the county land and the adjoining state park. The trail bisects mesic and scrubby flatwoods and passes over the blackwater stream, South Creek, within the park boundary. Threatened plant species in the park include the pine lily (*Lilium catesbaei*), erect prickly-pear (*Opuntia stricta*), coontie (*Zamia pumila*), and the endemic pine-hyacinth (*Clematis baldwinii)*.

The disturbed land was heavily infested with Brazilian pepper with coverage ranging from twenty to thirty percent overall and up to seventy-five percent within the corridor buffer. The southeast portion of the treatment area abuts SR-681 along the southeast edge of the park. The natural community in this area is mesic flatwoods and two depression marshes. This area was heavily infested by Brazilian pepper with approximately thirty percent coverage.

Species Treated	Common Name	Rank	Type	Herbicide
Schinus terebinthifolius	Brazilian pepper	I	BB	TRIE

Treasure Coast Working Group Projects



Jonathan Dickinson State Park

County: Martin
PCL Size: 11,480 acres

Project ID: TC-087	911 acres	$106,899
Project ID: TC-088	1,181 acres	$198,723

Project Manager: Florida Park Service (DEP)
Rob Rossmanith
13798 SE Federal Highway, Hobe Sound, Florida 33455
Phone: 772-546-0900, Fax: 772-223-2591
E-mail: robin.rossmanith@dep.state.fl.us

The upper reaches of the Loxahatchee River where John Phillips and the author used to go canoeing

The Loxahatchee River has been a scenic destination for many decades.

Old World climbing fern (lygodium) and downy rose-myrtle are the targets of a significant removal effort at JDSP. The overall design is to remove lygodium and other invasive plants from the tributaries of the Loxahatchee River located in the northwest section of the park. The Loxahatchee River is recognized as a National Wild and Scenic River and is home to numerous endangered plant and animal species.

The first project (TC-087) provided maintenance control in the zones treated in the previous year. Lygodium was treated in the Kitching Creek floodplain and other cypress wetland areas. Much of the project area is an integral component of a 2,600-acre State Wilderness Preserve in JDSP. The preserve is composed of pine flatwoods and cypress slough. The major drainages in the area, especially Kitching Creek, are important tributaries to the Loxahatchee River. The Florida Park Service provided $332,140 in matching grant funds for this project.

The second project (TC-088) was located on the eastern side of the Loxahatchee River, south of I-95, in the J and L management zones. The project area included the river floodplain, which was infested with arrowhead vine. All Category I invasive species were targeted for initial control, including melaleuca, Java plum, and shoebutton ardisia. Other exotic species existed only in small numbers. Retreatment of lygodium was conducted in a few areas. The natural communities in J and L management zones comprise a mosaic of pine flatwoods, oak hammock, strand cypress swamp, and willow swamp. There are several old fields in the area from past farming activity. The Florida Park Service provided $219,000 in matching grant funds for this project.

Parks District 5 Administration runs an exotic treatment crew composed of the District exotic plant biologist, two OPS exotic plant technicians, and two AmeriCorps volunteers. Control work in the E and F blocks equaled an in-kind match of $10,000 in time and materials. The BIPM Herbicide bank provided chemicals for maintenance control on an additional 100 acres of the park. Altogether, over $850,000 was expended for invasive plant control operations at JDSP in fiscal year 2007.

Species Treated	Common Name	Rank	Type	Herbicide
Eugenia uniflora	Surinam cherry	I	BB/HS	IMZ+TRIE
Lygodium japonicum	Japanese climbing fern	I	FL	GLY+MET
Lygodium microphyllum	Old World climbing fern	I	FL	GLY+MET
Melaleuca quinquenervia	melaleuca	I	CS	IMZ+TRIE

Jonathan Dickinson State Park

Species Treated	Common Name	Rank	Type	Herbicide
Psidium guajava	guava	I	BB/HS	IMZ+TRIE
Rhodomyrtus tomentosa	downy rose-myrtle	I	BB/HS	IMZ+TRIE
Schinus terebinthifolius	Brazilian pepper	I	BB/HS	IMZ+TRIE
Syngonium podophyllum	arrowhead vine	I	FL	GLY+24D
Syzygium cumini	Java plum	I	BB/HS	IMZ+TRIE
Xanthosoma sagittifolium	elephant ear	II	FL	GLY+24D
Mangifera indica	mango	n/a	BB/HS	IMZ+TRIE

Hungryland Wildlife and Environmental Area

County: Martin, Palm Beach
PCL Size: 12,415 acres
Project ID: TC-090 2,095 acres $141,050
Project ID: TC-091 1,630 acres $54,250

Project Manager: Fish and Wildlife Conservation Commission
Beth Morford, Biological Scientist III
8535 Northlake Boulevard, West Palm Beach, Florida 33412
Phone: 561-625-5122, x142, Fax: 561-625-5129
E-mail: beth.morford@myfwc.com

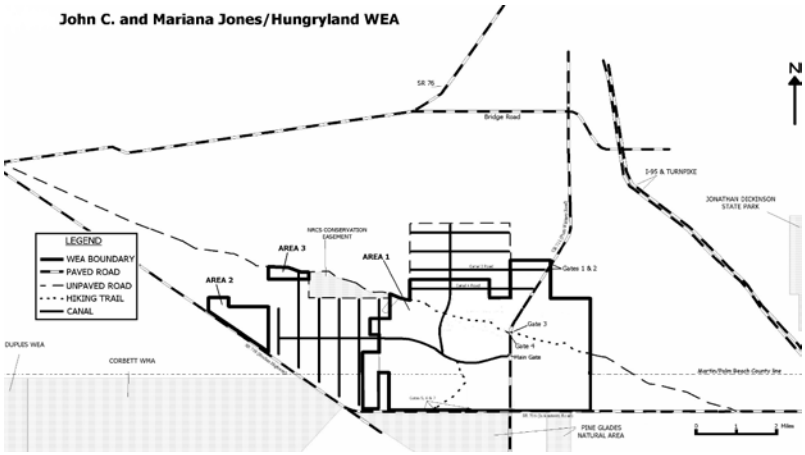
Early visitors to the area would recognize the pine flatwoods of Hungryland WEA today.

Hungryland Wildlife and Environmental Area (HWEA) crosses from southern Martin County into northern Palm Beach County. The natural communities of HWEA are comprised primarily of mesic and wet flatwoods, interspersed with depression marshes and wet prairies. *Florida Conservation Lands 2001* described HWEA as "one of the highest quality pine flatwoods in south Florida."

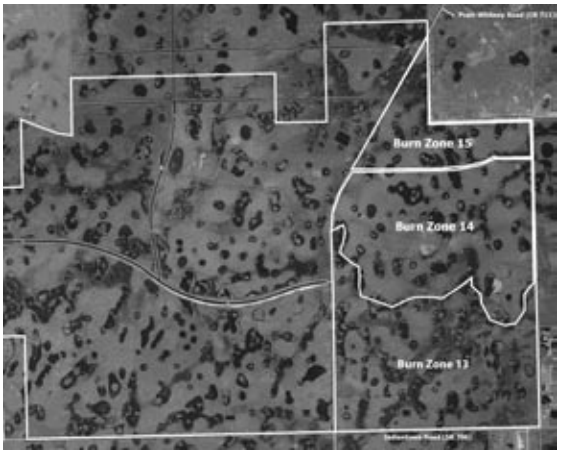
Three disjunct parcels separated by private land make up the HWEA, which is subdivided into multiple burn units. The first project targeted Burn Zones 14 and 15 to complete initial treatment. Burn Zone 14 is approximately 1,535 acres. Burn Zone 15 is approximately 560 acres. Invasive plants included primarily lygodium, Brazilian pepper, Australian pine, and melaleuca. BIPM funded treatment in 2003 and 2004 of a portion of the Old Jupiter-Indiantown Grade hiking trail, which crosses Zone 14, and the western end of Zone 15. Staff additionally treated exotics along the western edge of Zone 14.

The second project targeted 1,630 acres in Burn Zone 13 to complete initial control. Burn Zone 13 borders Burn Zone 14 to the north. The edges of Burn Zone 13 were treated with FWC funds in 2003 and 2006. FWC also conducted initial control operations on an additional 500 acres of Hungryland WEA during 2007, for an in-kind match of $50,000.

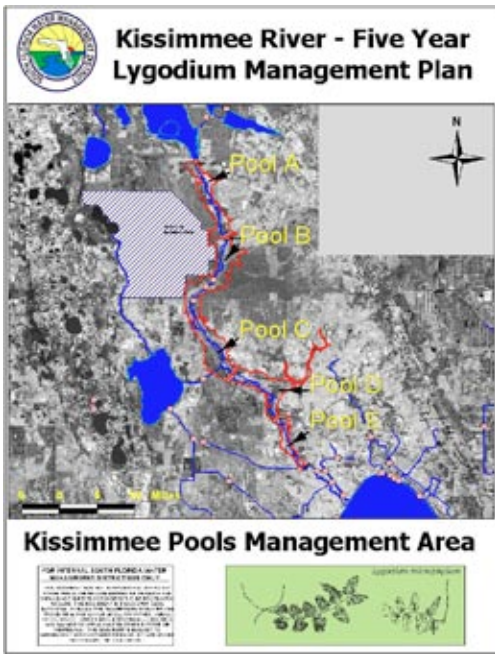
Species Treated	Common Name	Rank	Type	Herbicide
Lygodium microphyllum	Old World climbing fern	I	FL	GLY
Melaleuca quinquenervia	melaleuca	I	CS	TRIE
Schinus terebinthifolius	Brazilian pepper	I	CS	TRIE



Hungryland WEA



Kissimmee River Valley



County: Polk, Osceola, Okeechobee, Highlands, Glades
PCL Size: 36,879 acres
Project ID: TC-086 916 acres $75,000

Project Manager: South Florida Water Management District
Jeff McLemore
205 N. Parrott Avenue, Okeechobee, Florida 34972-2916
Phone: 800-250-4200 x3022, Fax: 863-462-5269
E-mail: jmclemo@sfwmd.gov

The project area encompasses district-owned lands in the Kissimmee River Valley between Lake Kissimmee and Lake Okeechobee. Old World climbing fern ("lygodium") in the project area was initially treated in 2003. Natural communities consist of mostly (90%) broad-leaved marsh, in addition to hardwood shrub, and live oak/palmetto hammock. The lands were purchased within the last 15 years to restore the Kissimmee River and its floodplain for improved water quality, increased water storage, and to reverse the degradation of the riverine habitat that occurred due to the channelization of the river.

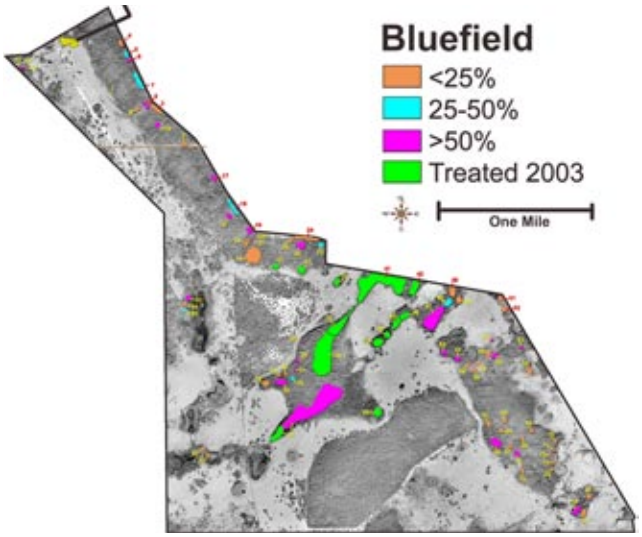
Aquaneat™ is used for aerial and ground crew treatments of lygodium, since most of the sites where the fern grows contain standing water at least part of the year. Lygodium infests primarily the floodplain marshes and adjacent hardwood shrub and hammock areas along the river. Most of the project area was treated by helicopter, with the remainder treated by ground crews. Contractors conducted the majority of the control effort, although district technicians also treat lygodium on the ground. Helicopter application of glyphosate is quite accurate and is aided by the use of an agricultural-type GPS unit on board. Ground crews use backpack sprayers to treat lygodium on the ground after any vines leading to the canopy have been cut with machetes. Care is taken to aerially treat sites with trees (cypress and maple) during the dormant season to spare the trees any ill effects.

The treatment sites are located in Pools A, B-C, D, and E. The original infestation was very dense both on the ground and in the shrub and canopy layers and was on the verge of completely covering much of the 1,700-acre area. On a reconnaissance flight in February of 2006, the same areas of infestation were observed. Staff believe that Hurricane Wilma contributed to the spread of lygodium to more private lands bordering these areas. The overall density of infestation for all areas has been reduced from high density to moderate to low density (most sites).

The District's fiscal year 2007 is the fifth year of treatment of *Lygodium* in the Kissimmee River Valley on District lands. The first year the District received $100,000 from BIPM to assist with the initial treatment. The District has received funds for follow-up treatments each year thereafter. The District provided $200,000 in matching funds for this project.

Species Treated	Common Name	Rank	Type	Herbicide
Lygodium microphyllum	Old World climbing fern	I	AE/FL	GLY

Bluefield Natural Area



County: St. Lucie
PCL Size: 3,285 acres
Project ID: TC-073 360 acres $113,480

Project Manager: St. Lucie County
Steven Fousek, Environmental Lands Specialist
2300 Virginia Avenue, Ft. Pierce, Florida 34982
Phone: 772-462-2525, Fax: 772-462-1684
E-mail: stevef@stlucieco.gov

Bluefield consists primarily of scrub, scrubby flatwoods, baygall, wet flatwoods, and prairie hammock. The areas of infestation occurred mainly in the baygall community, but were also in wet flatwoods, mesic flatwoods, and the edges of depression marsh communities. Densities ranged from less than twenty-five to over fifty percent, with some areas of infestation that approached total coverage.

The project area represented about one-half of the original lygodium coverage, the amount remaining after control work was conducted in 2003. The county provided a match of $10,000 as in-kind services of time and materials, including treatment of guava, Brazilian pepper, and tropical soda apple, and retreatment of climbing fern on the site.

Strap fern (*Campyloneurum* spp.) is an endangered species located within the project area. Several plants have been identified in areas where lygodium is moderate to absent. The absence of strap fern in some areas may have been caused by shading from the climbing fern.

Species Treated	Common Name	Rank	Type	Herbicide
Lygodium microphyllum	Old World climbing fern	I	FL	GLY

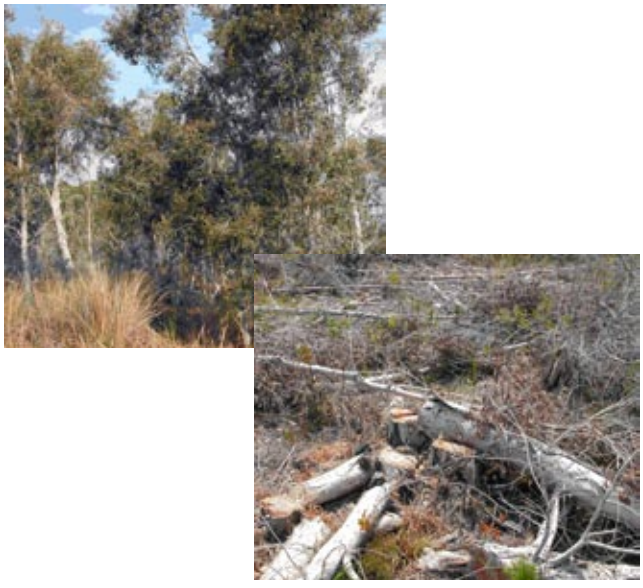
Savannas Preserve State Park

County: St. Lucie
PCL Size: 6,450.85 acres
Project ID: TC-089 244 acres $35,701

Project Manager: Florida Park Service (DEP)
Greg Kaufmann, Environmental Specialist
9551 Gumbo Limbo Lane, Jensen Beach, Florida 34957
Phone: 772-340-7530, Fax: 772-873-6467
E-mail: greg.kaufmann@dep.state.fl.us

The Savannas Preserve State Park stretches over 10 miles and is the largest, most ecologically intact stretch of freshwater basin marsh in southeast Florida. The preserve "buffers" the North Fork St. Lucie River, a state managed Aquatic Preserve and designated Outstanding Florida Water, from the negative impacts of urban encroachment and associated pollution. The treatment area targeted the basin marsh/flatwoods ecotone along the western park boundary. The Florida Park Service contributed an in-kind match of $5,000 in time and materials.

Species Treated	Common Name	Rank	Type	Herbicide
Cupaniopsis anacardioides	carrotwood	I	CS	IMZ
Imperata cylindrica	cogon grass	I	FL	GLY
Lygodium microphyllum	Old World climbing fern	I	FL	GLY
Melaleuca quinquenervia	melaleuca	I	CS	IMZ
Schinus terebinthifolius	Brazilian pepper	I	BB	TRIE
Panicum maximum	Guinea grass	II	FL	GLY
Sphagneticola trilobata	wedelia	II	FL	GLY



Ancient Oaks Natural Area

County: St. Lucie
PCL Size: 41 acres
Project ID: TC-092 35 acres $26,482

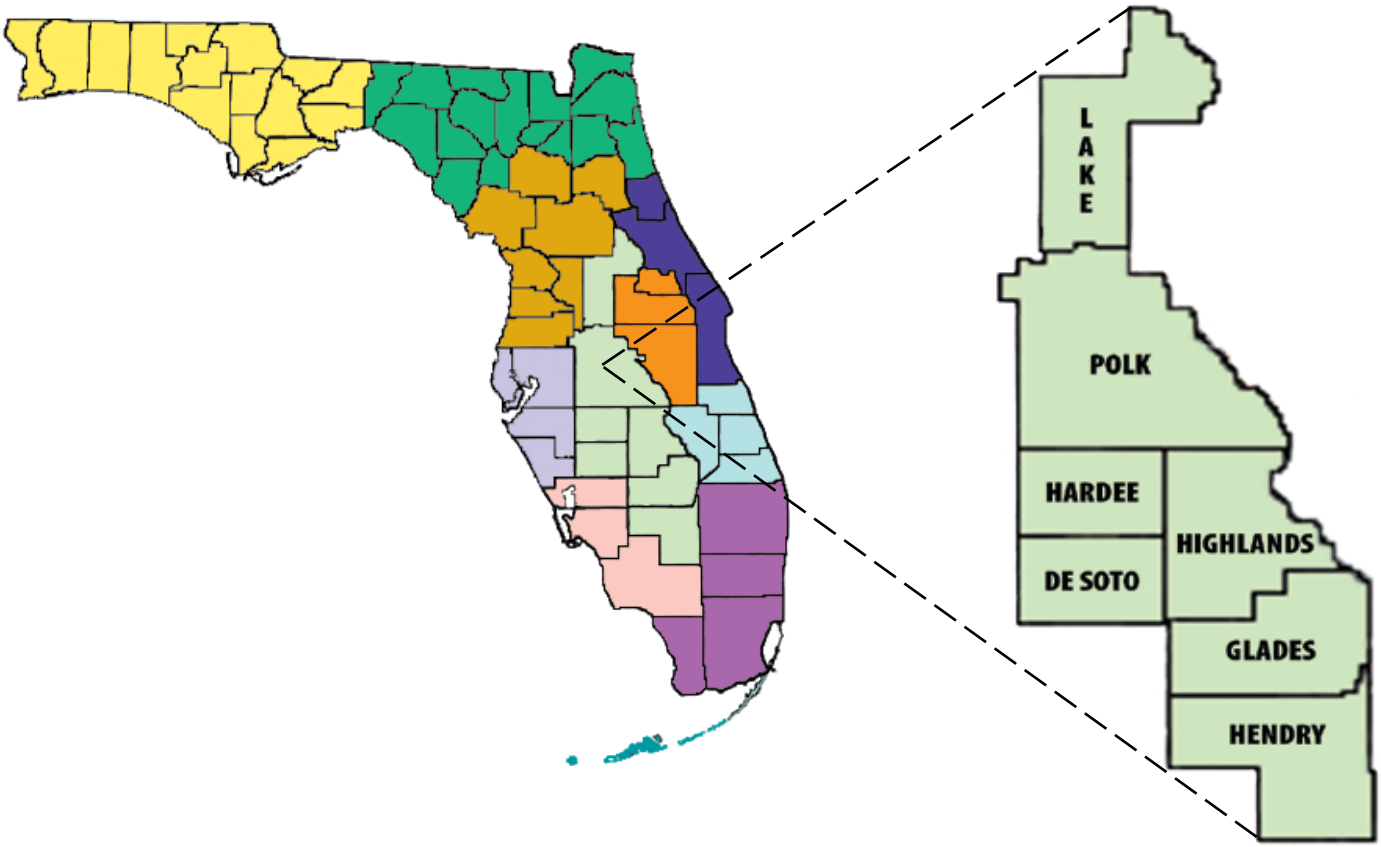
Project Manager: St. Lucie County
Mike Bush, Environmental Lands Specialist
2300 Virginia Avenue, Ft. Pierce, Florida 34982
Phone: 772-216-5947, Fax: 772-462-1684
E-mail: mikeb@stlucieco.gov

Ancient Oaks was acquired to preserve an old oak hammock. The property as a whole consists primarily of mesic flatwoods and hydric hammock. The endangered hand fern (*Ophioglossum palmatum*) is located on the site and within the control area. Exotics, predominantly shoebutton ardisia, Brazilian pepper, and strawberry guava, had invaded the hydric hammock.

Shoebutton ardisia occurred only in the hydric hammock. Ardisia was extremely dense, approximately 40,000 stems per acre in some instances, and comprised a large portion of the understory in many areas. Guava typically grew in the hydric hammock, but also within the ecotone between the hydric hammock and mesic flatwoods. Guava in many areas dominated the shrub layer, with densities ranging up to 2,000 stems per acre. Brazilian pepper was dispersed throughout the site, but large dense pockets occurred in the northeast portion of the site.

Species Treated	Common Name	Rank	Type	Herbicide
Ardisia crenata	coral ardisia	I	CS	TRIE
Ardisia elliptica	shoebutton ardisia	I	MC/CS	TRIE
Psidium cattleianum	strawberry guava	I	CS	TRIE
Schinus terebinthifolius	Brazilian pepper	I	BB	TRIE

West Central Working Group Projects



Fisheating Creek Wildlife Management Area

County: Glades
PCL Size: 18,272 acres

Project ID: WC-058	1,200 acres	$206,800
Project ID: WC-059	331 acres	$171,093
Project ID: WC-063	22 acres	$24,527
Project ID: WC-066	1,807 acres	$107,065
Project ID: WC-067	442 acres	$35,071

Project Manager: Fish and Wildlife Conservation Commission
Grant Steelman, Wildlife Biologist
3010 Banana Grove Road, Moore Haven, Florida 33471
Phone: 863-946-1194, Fax: 863-946-1087
E-mail: grant.steelman@myfwc.com

Treated climbing fern (brown) amidst cypress trees.

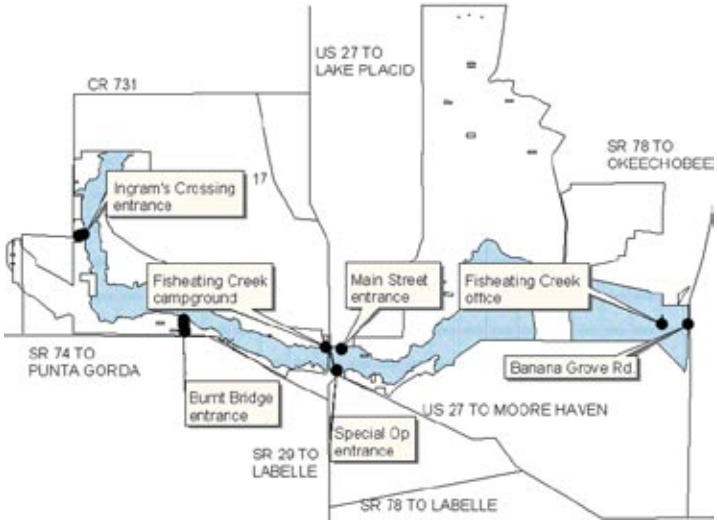
Fisheating Creek is the only non-dammed tributary to Lake Okeechobee. Natural communities in the WMA include cypress swamp, bottomland forest, freshwater marsh, dry prairie, prairie hammock, and hydric hammock. These projects targeted invasive exotics throughout the 20.3-mile Fisheating Creek channel.

The first project (WC-058) continued the second phase of a three-phase project treating all Category I exotics in the WMA, as well as all other invasive species found within the project area of the Fisheating Creek corridor. Phase II was broken down into two treatment years with approximately 900 acres treated in FY06. FWC contributed $300,000 to Phase I as of June 2006 and has overseen the treatment of 5,260 acres of exotic plant treatment for *Lygodium* and *Solanum*. Phase I was completed in May 2005. Phase II is expected to be completed by June 2008. FWC is seeking additional assistance in treating adjoining property through federal and state funding programs. Cypress domes bordering the WMA are becoming infested with *Lygodium* at an alarming rate, requiring public/private partnerships to treat the infestations within the 42,000-acre conservation easement surrounding the WMA.

Three maintenance control projects were conducted on the WMA in 2007. WC-059 was retreatment of 300 acres treated within Phase II during the previous fiscal year. WC-066 provided for maintenance control of Brazilian pepper and Australian pine. WC-067 was maintenance control of melaleuca and *Lygodium*. A fifth project (WC-063) targeted an area in Cowbone Marsh primarily for initial control of melaleuca, but also treated Australian pine and climbing fern.

Species Treated	**Common Name**	**Rank**	**Type**	**Herbicide**
Casuarina equisetifolia	Australian pine	I	BB/CS	TRIE/IMZ+GLY
Lygodium microphyllum	Old World climbing fern	I	FL/AR	GLY+MET
Melaleuca quinquenervia	melaleuca	I	CS	IMZ+GLY
Schinus terebinthifolius	Brazilian pepper	I	BB/CS	TRIE/IMZ+GLY
Solanum tampicense	wetland nightshade	I	FL	24D/GLY+MET
Solanum viarum	tropical soda apple	I	FL	GLY+MET
Melia azedarach	Chinaberry	II	BB	TRIE

Fisheating Creek WMA



Okaloacoochee Slough State Forest/Wildlife Management Area

County: Hendry, Collier
PCL Size: 35,039 acres
Project ID: WC-055 22,000 acres $57,000

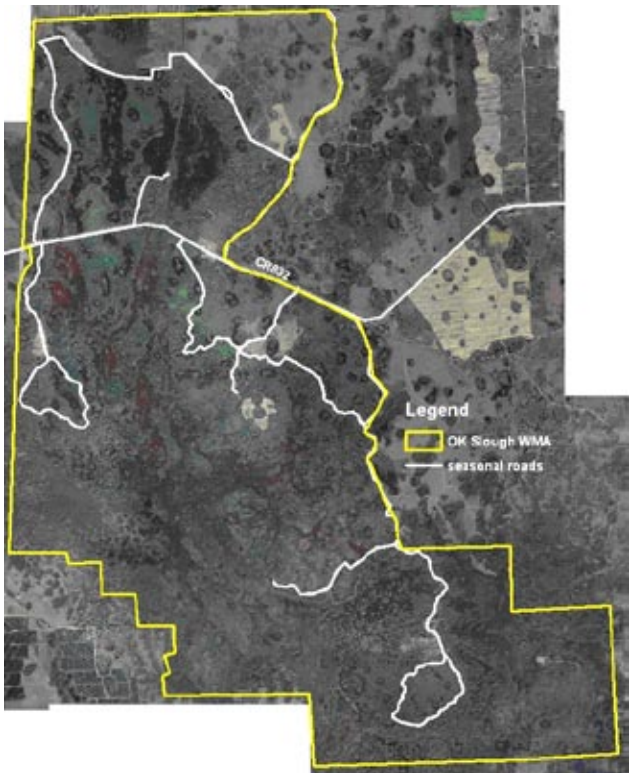
Project Manager: Fish and Wildlife Conservation Commission
Jean McCollom, Biologist III
PO Box 716, Felda, Florida 33930
Phone: 863-612-0775, Fax: 863-612-0786
E-mail: jean.mccollom@myfwc.com

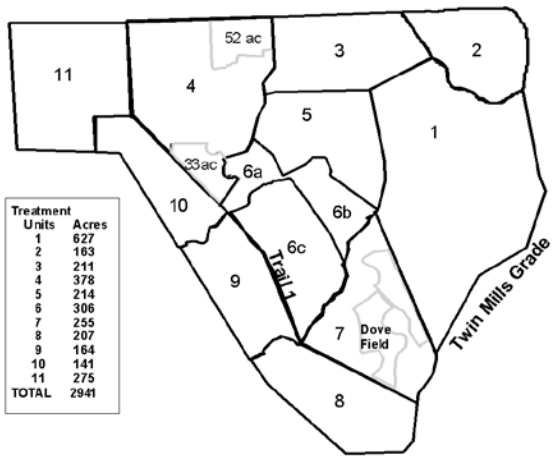
The 'OK' Slough Wildlife Management Area is generally hydric in nature, with approximately 12,000 acres of mesic flatwoods and oak-cabbage palm hammocks persisting on the driest sites. The remaining two-thirds of the forest is made up of approximately 20,000 acres of a variety of plant native communities such as dome swamp, swale, depression marsh, and hardwood swamp, and approximately 2,500 acres of abandoned pasture and old fields. Timber, agriculture, and cattle operations comprised the historic use of the property. Rare plants include the listed species cutthroat grass (*Panicum abscissum*), as well as threatened bromeliads, orchids, and ferns.

All of OK Slough has been treated for some invasive plant species in the past. Areas of infestation occurred throughout the Wildlife Management Area. This maintenance project retreated 3,000 acres managed by the FWC as part of the OK Slough WMA and 19,000 acres of the State Forest.

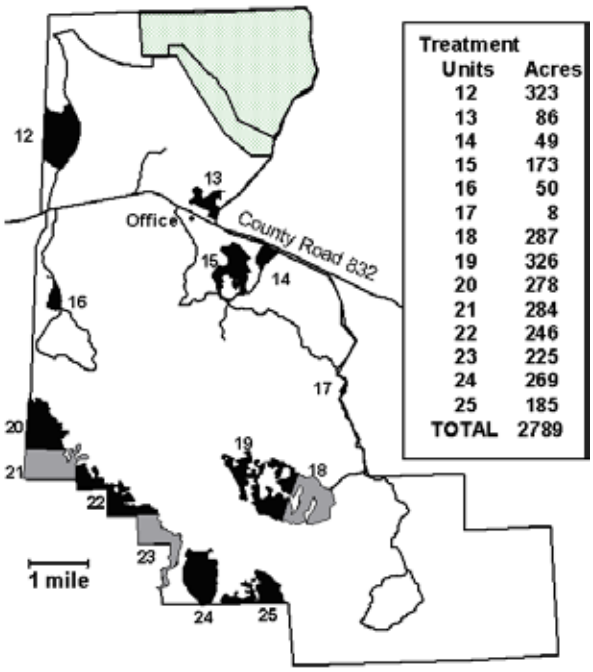
Species Treated	**Common Name**	**Rank**	**Type**	**Herbicide**
Hymenachne amplexicaulis	West Indian marsh grass	I	FL	GLY
Imperata cylindrica	cogon grass	I	FL	GLY
Lygodium microphyllum	Old World climbing fern	I	FL	GLY
Schinus terebinthifolius	Brazilian pepper	I	FL	GLY
Solanum viarum	tropical soda apple	I	FL	GLY
Urochloa mutica	Pará grass	I	FL	GLY
Melinis repens	Natal grass	II	FL	GLY
Urena lobata	Caesar's weed	II	FL	GLY
Limnocharis flava	yellow velvetleaf	n/a	FL	GLY

Okaloacoochee Slough





Treatment units located on the FWC managed portion of Okaloacoochee Slough (above; stippled area on map below) and treatment units located on DOF managed portion of Okaloacoochee Slough



Avon Park Air Force Range

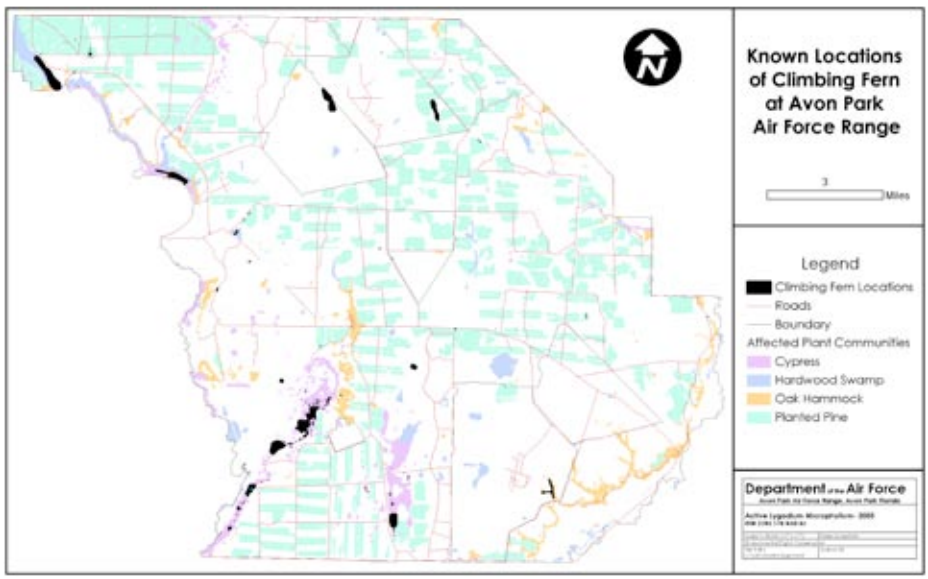
County: Highlands, Polk
PCL Size: 106,110 acres
Project ID: WC-054 510 acres $7,571

Project Manager: Department of Defense, U. S. Air Force
Clarence Morgan
18 ASOG, DET 1, OL, A CEVN
29 South Boulevard, Avon Park Air Force Range, Florida 33825-5700
Phone: 863-452-4119 x323, Fax: 863-452-4161
E-mail: clarence.morgan@avonpark.macdill.af.mil

Avon Park Air Force Range (APAFR) is the largest parcel of natural land in the Greater Arbuckle Ecosystem. Its numerous natural communities include rare scrub, dry prairie, and cutthroat grass seeps. The APAFR supports an amazing array of rare plants and animals, including twelve animals and two plants that are listed as federally endangered or threatened species.

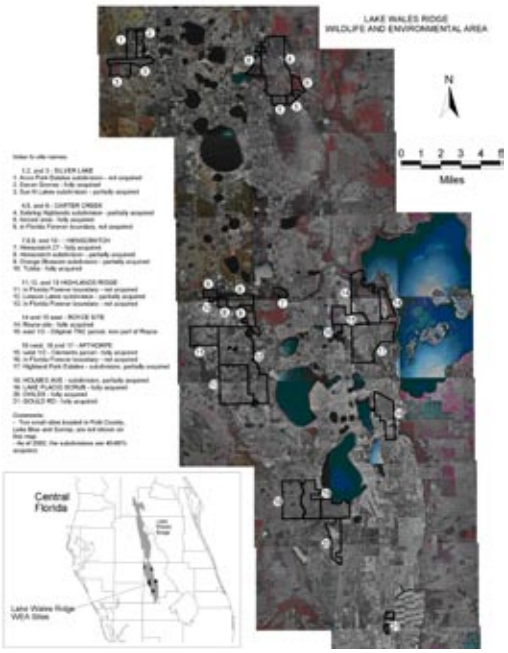
This project provided ground-based maintenance control for climbing fern that infested cypress and hardwood swamps at APAFR. Since 1999, the installation has had an aggressive exotic plant control program focused on finding and controlling the spread of climbing fern. As of January 2005, all known sites had been treated. At least five sites had infestations that required treatment to eliminate seed bank and root re-sprouting.

Species Treated	Common Name	Rank	Type	Herbicide
Lygodium japonicum	Japanese climbing fern	I	FL	GLY
Lygodium microphyllum	Old World climbing fern	I	FL	GLY
Melaleuca quinquenervia	melaleuca	I	CS	GLY+IMZ



Lake Wales Ridge Wildlife and Environmental Area

County: Highlands, Polk
PCL Size: 25,000 acres
Project ID: WC-057 6,190 acres $75,000



Project Manager: Fish and Wildlife Conservation Commission
Michael McMillian, Biological Scientist III
1630 Royce Ranch Avenue, Lake Placid, Florida 33852
Phone: 863-699-3740, Fax: 863-699-3741
E-mail: mike.mcmillian@myfwc.com

The Lake Wales Ridge Wildlife and Environmental Area (WEA) encompasses 19 tracts of land scattered over roughly 75 miles of the Lake Wales Ridge in Highlands and Polk Counties. The Lake Wales Ridge is a unique and vulnerable habitat of which only ten to fifteen percent remains. The scrub community supports several species of threatened and endangered animals and is home to the Florida scrub jay. Sixteen federally listed endangered plant species occur here, including pygmy fringetree (*Chionanthus pygmaneus*), shortleaved rosemary (*Contradina brevifolia*), scrub blazing star (*Liatris ohlingerae*), Florida scrub plum (*Prunus geniculata*), and Carter's mustard (*Warea carteri*).

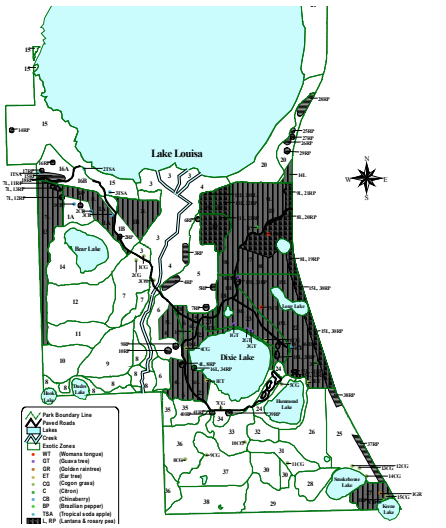
This project consisted of maintenance control of invasive species scattered over 13 of the tracts within the WEA. The FWC contributed $41,350 to the project as an in-kind match of time and materials.

Species Treated	**Common Name**	**Rank**	**Type**	**Herbicide**
Abrus precatorius	rosary pea	I	FL	GLY+MET
Albizia julibrissin	mimosa	I	CS	TRIE
Albizia lebbeck	woman's tongue	I	CS	TRIE
Cinnamomum camphora	camphor tree	I	CS	TRIE
Dioscorea spp.	air-potato	I	CS/FL	TRIE/GLY+MET
Imperata cylindrica	cogon grass	I	FL	GLY+MET
Lantana camara	lantana	I	BB	TRIE
Lygodium microphyllum	Old World climbing fern	I	FL	GLY+MET
Nephrolepis spp.	sword fern	I	FL	GLY+MET
Schinus terebinthifolius	Brazilian pepper	I	BB	TRIE
Solanum viarum	tropical soda apple	I	CS	TRIE
Triadica sebifera	Chinese tallow	I	BB	TRIE
Melia azedarach	Chinaberry	II	CS	TRIE
Panicum maximum	Guinea grass	II	FL	GLY+MET
Passiflora biflora	passion flower	II	CS/FL	TRIE/GLY+MET
Ricinus communis	castor bean	II	CS	TRIE
Urena lobata	Caesar's weed	II	CS/FL	TRIE/GLY+MET
Momordica charantia	balsampear	n/a	FL	GLY+MET
Musa spp.	banana	n/a	CS	TRIE

Lake Louisa State Park

County: Lake
PCL Size: 4,450 acres
Project ID: WC-045 508 acres $33,500

Project Manager: Florida Park Service (DEP)
Christy Burch, Park Services Specialist
7305 US Hwy 27, Clermont, Florida 34714
Phone: 352-394-3969, Fax: 352-394-1318
E-mail: christiann.burch@dep.state.fl.us



Much of the uplands of the park are former sandhills that were converted to orange groves. The citrus froze out in the late 1980s, before state acquisition. At least two endangered plants can be found in the park: Curtiss' milkweed (*Asclepias curtissii*) and Florida bonamia (*Bonamia grandiflora*). Lake Louisa State Park adjoins Hilochee Wildlife Management Area and lies within the Green Swamp Area of Critical State Concern.

Rosary pea and lantana occurred throughout the park, primarily growing over sour citrus shrubs. The areas proposed for control are three zones where partial restoration of the former sandhill community has begun. In these zones, park staff planted longleaf pine saplings and several wildflower species. These zones are burned every one to two years to reduce the rate of spread of exotics and encourage growth within the planted pines.

Species Treated	Common Name	Rank	Type	Herbicide
Abrus precatorius	rosary pea	I	FL	TRIE
Lantana camara	lantana	I	FL	TRIE

Florida has a native species of lantana. This is not it.

Lantana camara is globally invasive—one of the world's worst weeds. These planted pines are going to need help to survive.

Circle B Bar Reserve/Gator Creek Reserve

County: Polk
Circle B Bar Reserve
PCL Size: 1,267 acres
Gator Creek Reserve
PCL Size: 2,708 acres
Project ID: WC-060 1,993 acres $36,580

Project Manager: Polk Natural Resources Division
Tabitha Biehl, Polk County Environmental Lands
4177 Ben Durrance Road, Bartow, Florida 33830
Phone: 863-534-7377 x272, Fax: 863-534-7374
E-mail: tabithabiehl@polk-county.net

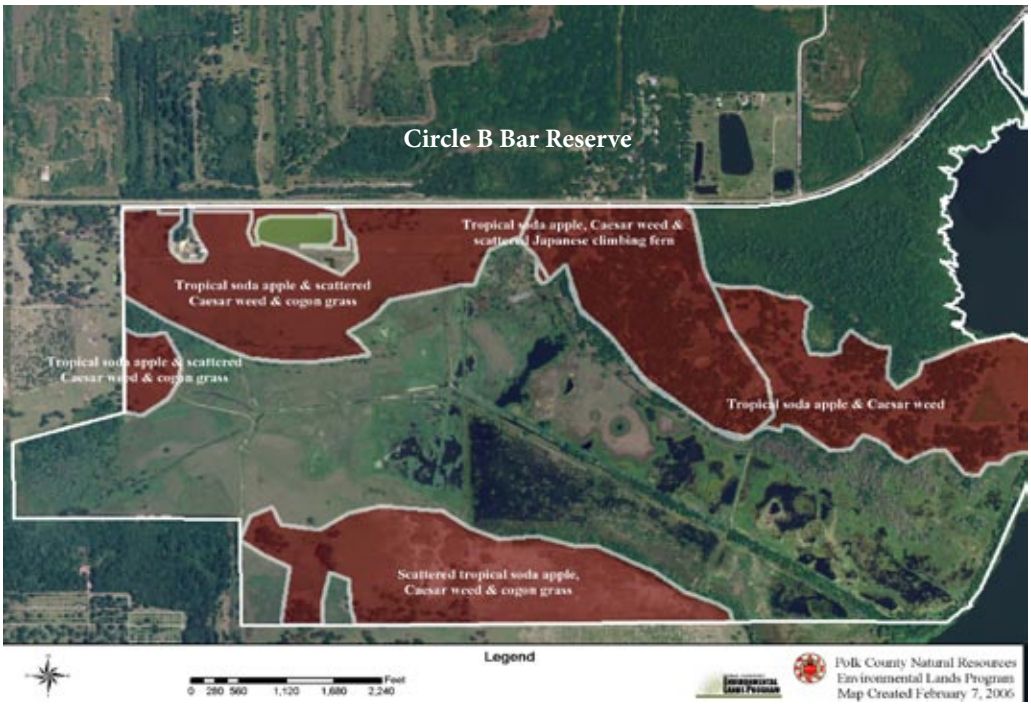
Polk County and Southwest Florida Water Management District jointly own the Circle B Bar Reserve. The site was a cattle ranch prior to public acquisition, but still contains several natural communities such as cypress domes, wet prairie, mixed wetland hardwoods, bay swamp, live oak hammock, and upland hardwood forest.. Two state-listed plant species, butterfly orchid and giant air plant, grow in the oak hammocks on the site. The removal of cattle allowed a tremendous increase in some invasive species.

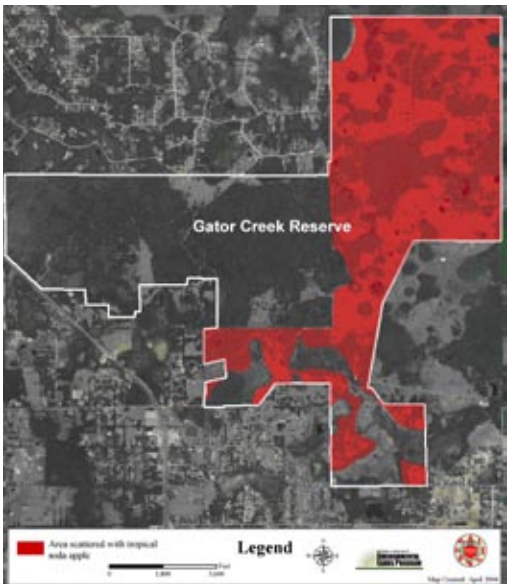
BIPM funded control operations in fiscal tears 2003, 2005, and 2006 that targeted cogon grass, Brazilian pepper, Chinese tallow, tropical soda apple, skunk vine, Japanese climbing fern, and Caesar's weed. The current project provided maintenance control for tropical soda apple and Caesar's weed scattered across 590 acres, with coverage ranging from five to thirty percent.

Gator Creek Reserve links to conservation easements in the Green Swamp, adding to a corridor of natural areas that extends to the 150,000 acres of conservation land in the Green Swamp. The Reserve also preserves a three-mile stretch of Gator Creek. Natural communities include flatwoods, cypress domes, freshwater marsh, floodplain swamp, depression marsh, and basin swamp. Historical cattle operation left the site with scattered infestation of tropical soda apple. This part of the project provided treatment of approximately 1,300 acres for scattered tropical soda apple and Caesar's weed. Polk County provided an in-kind match of $15,000 in time and materials for treating invasives on both managed areas.

Species Treated	Common Name	Rank	Type	Herbicide
Solanum viarum	tropical soda apple	I	FL	TRIE
Urena lobata	Caesar's weed	II	FL	GLY

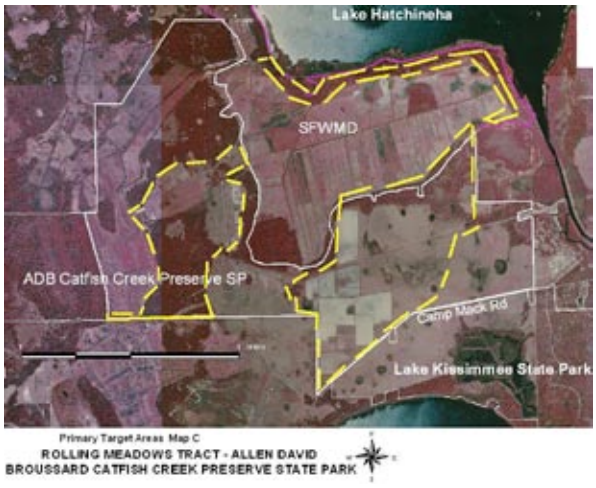
Circle B Bar/Gator Creek





Tropical soda apple—cows eat the fruit and spread the seeds.

Catfish Creek Preserve State Park



County: Polk
PCL Size: 8,017 acres
Project ID: WC-062 1,730 acres $17,400

Project Manager: Florida Park Service (DEP)
Erik Egensteiner, Park Biologist
14248 Camp Mack Road, Lake Wales, Florida 33898
Phone: 863-696-1112, Fax: 863-696-2656
E-mail: erik.egensteiner@dep.state.fl.us

The Rolling Meadows tract, a new addition to the park, is located just west of Lake Kissimmee State Park. The South Florida Water Management District owns another part of the Rolling Meadows tract that is adjacent to and north of the park property. The park portion of the Rolling Meadows tract is approximately 3,800 acres and includes ruderal areas consisting of pasture and sod farm areas, hydric hammock, mesic and wet flatwoods, floodplain marsh, numerous depression marshes, and baygalls. The District portion is about 2,000 acres that consist of ruderal habitat (mostly sod areas), dome swamp, floodplain forest, and marsh. The sod areas on both properties are slated for restoration as part of the Kissimmee River Restoration Project.

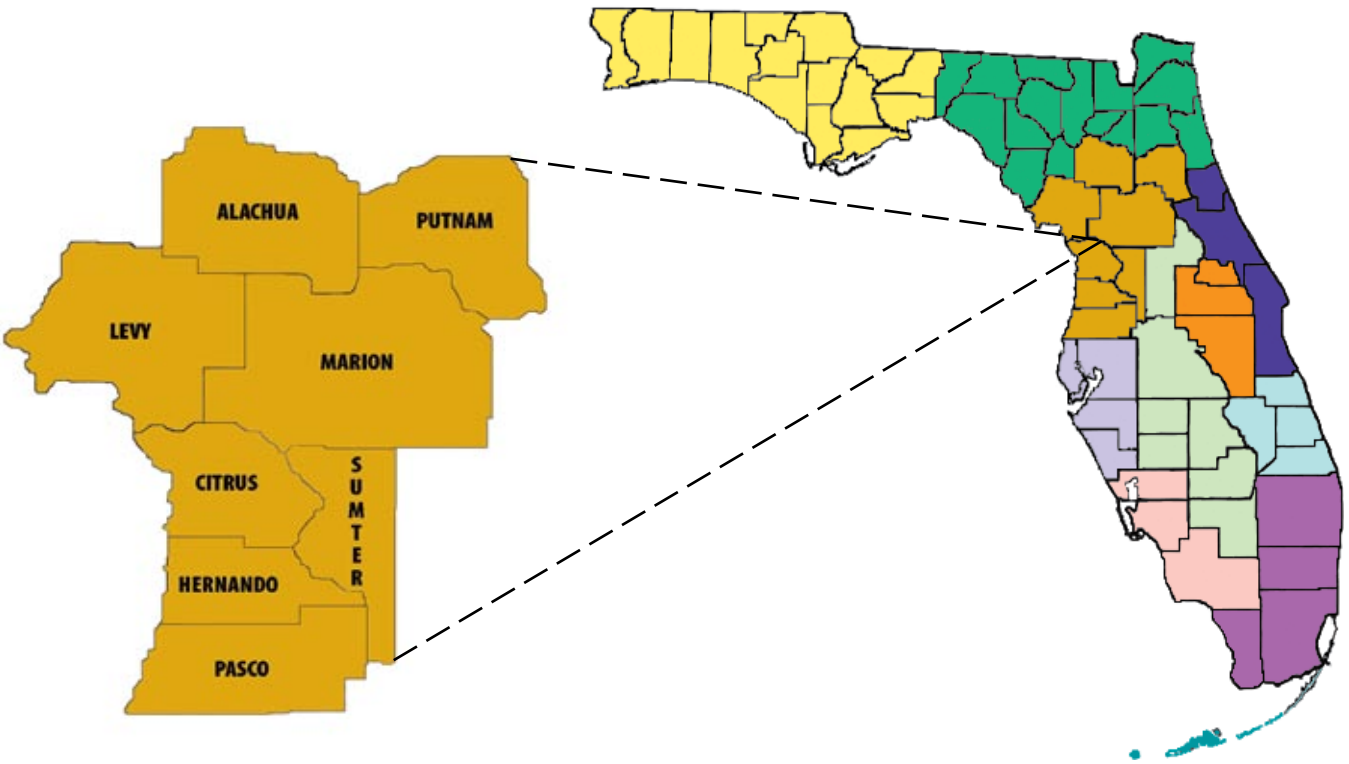
Invasive plants occurred throughout the tract, but were primarily located in the pastures and in hammocks on the park property. Exotics on the SFWMD property were mostly found on the edges of the sod area and into the floodplain along Lake Hatchineha. Pastures make up about 1,730 acres of the tract. Two pastures were previously treated by contractors and are now under maintenance control. In some areas of the untreated pastures, cogon grass grew in small scattered clumps, while other areas contained one to two-acre solid patches. Cogon grass also grew along many of the ditches on site. Approximately 30 to 50 acres of cogon grass was on the tract.

Tropical soda apple was scattered over the pastures and much of it occurred adjacent to areas where cogon grass was found. Caesar's weed was scattered throughout the pastures, among the areas where the other exotics also occurred, as well as in the hammocks and along the canals surrounding the sod areas. Scattered climbing fern was also found along these canals. Small amounts of Pará grass and torpedo grass were also observed on the property.

This project was jointly funded by BIPM ($17,400), the SFWMD ($17,400), and the Florida Park Service ($11,000). The BIPM Herbicide Bank additionally provided $1,702 in chemicals to treat a separate 23-acre area.

Species Treated	**Common Name**	**Rank**	**Type**	**Herbicide**
Imperata cylindrica	cogon grass	I	FL	GLY+IMZ
Lygodium japonicum	Japanese climbing fern	I	FL	GLY+MET
Lygodium microphyllum	Old World climbing fern	I	FL	GLY+MET
Schinus terebinthifolius	Brazilian pepper	I	CS	TRIE
Solanum viarum	tropical soda apple	I	BB	TRIE
Urena lobata	Caesar's weed	II	BB	TRIE

Withlacoochee Working Group Projects



University of Florida Conservation Areas

County: Alachua
PCL: *various, see below*
Project ID: WR-083 164 acres $44,600

Project Manager: University of Florida
Erick D. Smith, Urban Forester
P.O. Box 117700, Gainesville, Florida 32611-7700
Phone: 352-392-7722
E-mail: edsmith@ufl.edu

This project controlled invasive species in seven Conservation Areas at the University of Florida. UF has over thirty Conservation Areas on campus and every site had some level of infestation. *Trillium maculataum* (spotted wakerobin) and *Smilax lasioneuron* (blueridge carrionflower) are two rare species occurring here at the extent of their native ranges. Other significant species include the very rare *Collinsonia serotina* (blueridge horsebalm), the state threatened *Athyrium filix-femina* ssp. *asplenioides* (southern lady fern), and the state endangered *Matelea floridana* (Florida milkvine).

Bartram-Carr Woods is a 9-acre upland hardwood forest identified for conservation due to the water quality, flood control, and erosion abatement benefits the area provides, along with the mature and relatively intact hardwood forest. This Conservation Area has been one of the focus sites for *The Great Air-Potato Roundup* for over 4 years. Digital Design Wetland is 7.8 acres that include a portion of the floodplain of the unnamed creek that flows west to Lake Alice and is primarily made up of wetlands and transitional areas. Historical photography and documents indicate that this area was previously more of a depression marsh and a sink named Sweet Sink.

University Park Arboretum is a 2.4-acre Conservation Area. Elizabeth Creek, a tributary to Hogtown Creek, and surrounding neighborhoods have been the source for invasive plants colonizing this site. The area has now become a headwater source to areas downstream in the basin. Harmonic Woods is a 10-acre relatively undisturbed upland hardwood forest that slopes down to Lake Alice. Lake Alice Conservation Area is an approximately 129-acre natural area with a mix of community types and an undeveloped shoreline buffer along the lake. McCarty Woods is a 2.9-acre disturbed upland hardwood forest, bisected with paths for pedestrians. Reitz Ravine Woods Conservation Area is a 2.9-acre mixed hardwood forest that grades down to a narrow stream valley.

Species Treated	Common Name	Rank	Type	Herbicide
Ardisia crenata	coral ardisia	I	FL	TRIE
Cinnamomum camphora	camphor tree	I	BB/CS	TRIE
Dioscorea bulbifera	air-potato	I	FL	GLY
Imperata cylindrica	cogon grass	I	FL	GLY
Lantana camara	lantana	I	CS/FL	GLY+TRIE
Ligustrum lucidum	glossy privet	I	BB/CS	TRIE
Macfadyena unguis-cati	cat's-claw vine	I	FL	GLY±TRIE
Syngonium podophyllum	arrowhead vine	I	FL	GLY+TRIE
Triadica sebifera	Chinese tallow	I	CS	TRIE
Hedera helix	English ivy	n/a	BB	GLY+TRIE

Crystal River Preserve State Park

County: Citrus
PCL Size: 27,900 acres
Project ID: WR-079 282 acres $177,387

Project Manager: Florida Park Service (DEP)
Keith Morin
3266 N. Sailboat Avenue, Crystal River, Florida 34428
Phone: 352-563-0450, Fax: 352-563-0246
E-mail: keith.morin@dep.state.fl.us

Crystal River Preserve provides an upland buffer to the St. Martins Marsh Aquatic Preserve. The Preserve contains a diversity of natural communities such as estuarine tidal marsh, hydric hammock, marsh (prairie) hammock, estuarine tidal swamp, pine flatwoods, scrubby flatwoods, scrub, and floodplain swamp. Fifty state and/or federally listed species occur on or immediately adjacent to the Preserve. Rare plant species include Godfrey's privet (*Forestiera godfreyi*), Catesby's lily (*Lilium catesbaei*), cardinal flower (*Lobelia cardinalis*), yellow butterwort (*Pinguicula lutea*), gypsy spikes (*Platanthera flava*), and Atamasco lily (*Zephyranthes atamasco*).

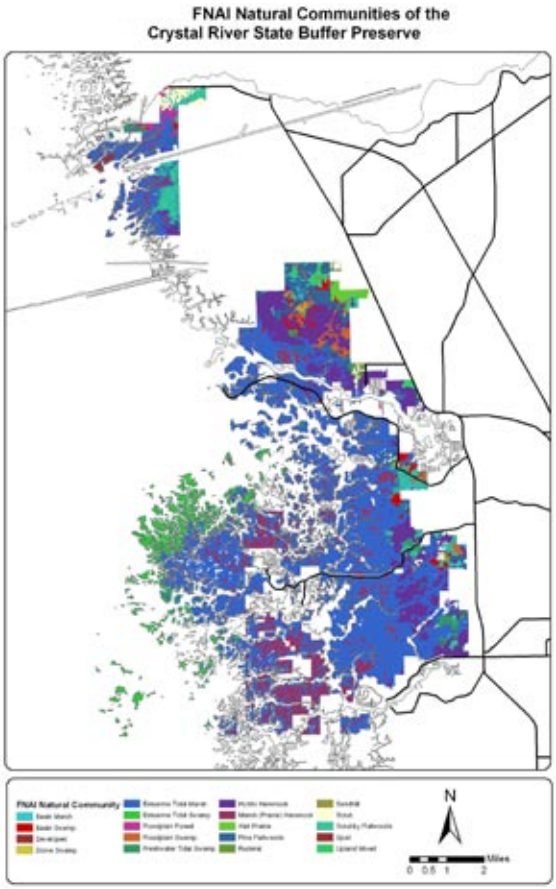
Brazilian pepper began to infest coastal Citrus County after the tidal surge associated with the "No-Name Storm" of 1993. Brazilian pepper occurs on brackish high marsh areas, hydric hammocks, shell mounds, and coastal spoil islands. The displacement of native vegetation is quite apparent in areas where Brazilian pepper is well established. Of particular concern is the loss of mangroves due to Brazilian pepper encroachment. Brazilian pepper coverage on the Preserve ranges from twenty to eighty percent.

Initial and follow-up treatments of Brazilian pepper were conducted in sections of the Preserve from 1998-2001 and from 2003-2004. BIPM provided funding of approximately $130,000 in 2001 and $125,000 in 2003-2004, mostly for initial treatment of Brazilian pepper in sections of St. Martin's River, Salt River, Head Creek, Fish Creek, and the bays east of Pirates Cove. The 2007 project targeted previously untreated sites in the Central and Western Islands management zones of the Preserve.

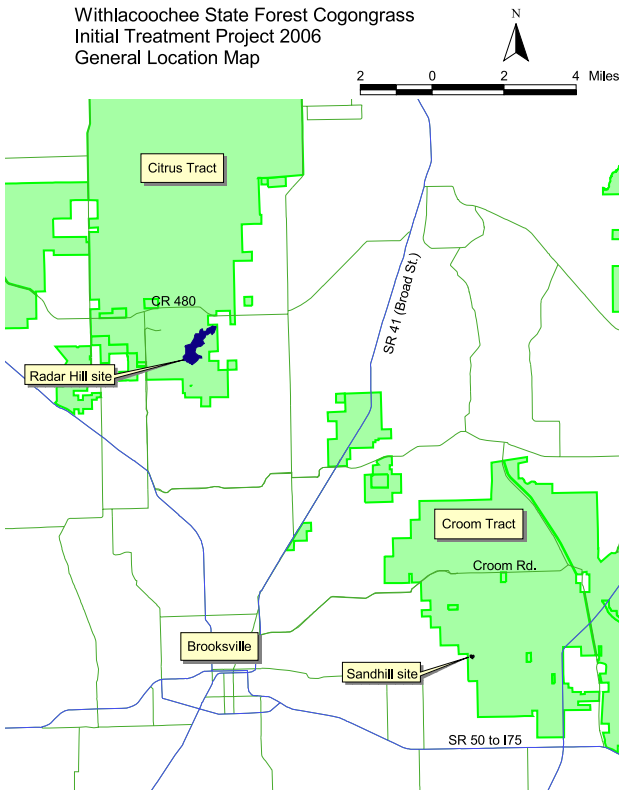
The Florida Park Service provided an in-kind match of $10,930 in time and materials. Park staff treated cogon grass and air-potato on the Preserve. Cogon grass occurred primarily on disturbed sites totaling approximately 2.5 acres, with a generally low density and intermixed with bahia grass at some sites and with native groundcover at others. Air-potato grew in the Church House Hammock tract, the Yulee Ruins Historic State Park, and in the Dixie Shores area and appeared to be limited to small areas at each site.

Species Treated	**Common Name**	**Rank**	**Type**	**Herbicide**
Dioscorea bulbifera	air-potato	I	FL	TRIA
Imperata cylindrica	cogon grass	I	FL	GLY
Schinus terebinthifolius	Brazilian pepper	I	BB/FL	TRIE

Crystal River Preserve



Withlacoochee State Forest



County: Hernando
PCL Size: 155,270 acres
Project ID: WR-076 218 acres $26,248

Project Manager: Division of Forestry (DACS)
Vincent Morris
15019 Broad Street, Brooksville, Florida 34601
Phone: 352-754-6777 x125, Fax: 352-754-6751
E-mail: morrisv@doacs.state.fl.us

The project area included two sites generally located in the uplands of the Brooksville Ridge. The first site, in the southern portion of the Croom Tract, is sandhill that is managed for red-cockaded woodpeckers. Cogon grass covered the entire 4.4-acre site.

The second site, in the southern portion of the Citrus Tract, was the former Radar Hill Mine. Remnant natural communities associated with the mine include sandhill, upland mixed forest, depression marsh, sink, and terrestrial cave. The surrounding area of the state forest still contains intact sandhill, hammock, and marsh. Cogon grass was widely scattered in at least 314 individual spots over the 214-acre site, with an estimated coverage of five percent.

The Division of Forestry conducted additional in-house work as an in-kind match worth $93,520 in time and materials.

Species Treated	Common Name	Rank	Type	Herbicide
Imperata cylindrica	cogon grass	I	foliar	GLY+IMZ

Perry Oldenburg Mitigation Park/Withlacoochee State Forest

County: Hernando
Perry Oldenburg Mitigation Park Wildlife Environmental Area
PCL Size: 368 acres
Withlacoochee State Forest
PCL Size: 157,481 acres
Project ID: WR-077 377 acres $10,632

Project Manager: Fish and Wildlife Conservation Commission
Shane Belson
1601 Scotty's Road, Kissimmee, Florida 34744
Phone: 407-846-5300 x1003, Fax: 407-846-5310
E-mail: shane.belson@fwc.state.fl.us

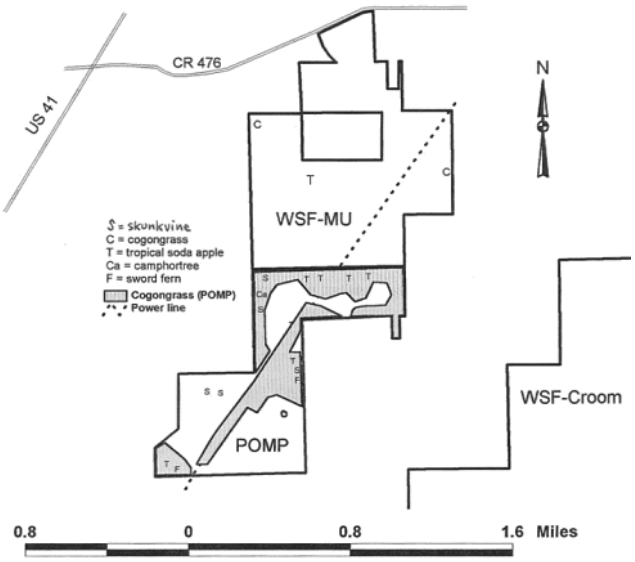
Perry Oldenburg Mitigation Park Wildlife and Environmental Area (POMP) encompasses areas of sandhill (277 acres), hardwood hammock (72 acres), freshwater marsh (9 acres), old field (10 acres), and powerline right-of-way (12 acres). The infestations at POMP occurred principally within a 150-acre sandhill restoration area and along fire lines, fence lines, and other disturbed sites.

The 491-acre Marsh Unit of the Withlacoochee State Forest consists of longleaf pine plantation (165 acres), mesic hammock (250 acres), a pond (7 acres), and improved pasture (62 acres). By the 1960s, the former sandhills of the site had been converted to cattle pasture. The invasive species at the Marsh Unit occurred in the pasture and pine plantation areas.

Initial treatment of the infestations described above occurred during fiscal year 2006. In addition to maintenance control of the original project area, the contractor also treated incidental species occurring on the remainder of POMP and WSF-MU.

Species Treated	Common Name	Rank	Type	Herbicide
Abrus precatorius	rosary pea	I	BB/FL	TRIE/TRIA
Albizia julibrissin	mimosa	I	BB	TRIE
Ardisia crenata	coral ardisia	I	BB	TRIE
Cinnamomum camphora	camphor tree	I	BB	TRIE
Dioscorea bulbifera	air-potato	I	FL	GLY
Imperata cylindrica	cogon grass	I	FL	GLY
Lygodium japonicum	Japanese climbing fern	I	FL	GLY
Nandina domestica	nandina	I	BB	TRIE
Solanum viarum	tropical soda apple	I	BB	TRIE
Triadica sebifera	Chinese tallow	I	BB	TRIE
Wisteria sinensis	Chinese wisteria	II	BB	TRIE

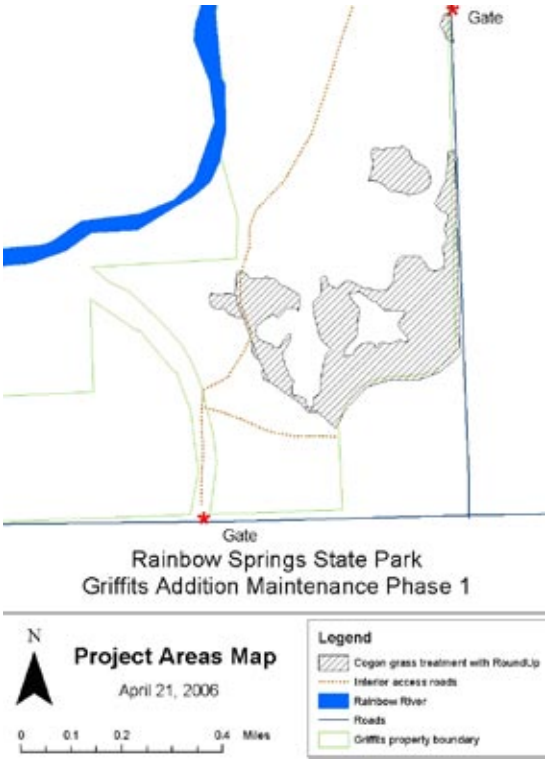
Perry Oldenburg/Withlacoochee



Rainbow Springs State Park

County: Marion
PCL Size: 1,449 acres
Project ID: WR-075 55 acres $19,250

Project Manager: Florida Park Service (DEP)
Robert Wilson, Park Manager
19158 SW 81st Place Road, Dunnellon, Florida 34432
Phone: 352-489-8503, Fax: 352-465-7855
E-mail: robert.s.wilson@dep.state.fl.us



The project area was located on a recently acquired addition to Rainbow Springs State Park. The Park added the 365-acre Griffitts property in 2004. The tract was previously managed largely for timber production, although pastures are also present on the property. Sandhill is the predominant natural community (~300 acres), with smaller areas of mesic flatwoods, and hydric hammock directly adjacent to the Rainbow River.

Within Phase I approximately 33 acres of cogon grass grew as understory in sandhill. Coverage varied from very dense to moderately dense on about 20 acres and patchy and sparse on the remaining acreage. Another 15 acres of cogon grass infested a 21-acre block of formerly good quality sandhill that, though logged, was never converted to sand pine plantation. In this area cogon grass occurred in either dense small patches or sparsely scattered as single blades intermixed among native groundcover. Less than 2 acres of cogon grass was found in pasture abutting the western edge of Phase 1.

This project consisted of maintenance control on the Phase I area, which received initial control in the previous fiscal year (FY06). FPS contributed $6,600 in matching funds and $4,294 of in-kind match in time and materials to this project.

Species Treated	Common Name	Rank	Type	Herbicide
Imperata cylindrica	cogon grass	I	FL	GLY

Marjorie Harris Carr Cross-Florida Greenway

County: Marion
PCL Size: 93,241 acres

Project ID: WR-078	9,000 acres	$36,712
Project ID: WR-080	7,500 acres	$46,164
Project ID: WR-081	3,100 acres	$50,760
Project ID: WR-084	1,220 acres	$110,434

Site Manager: Office of Greenways and Trails (DEP)
Adele Mills
200 Buckman Lock Road, Palatka, Florida 32177
Phone: 386-312-2273, Fax: 386-312-2276
E-mail: adele.mills@dep.state.fl.us

Multiple contractors working on one project is unusual and requires extra coordination and planning.

The Cross-Florida Greenway (CFG) has evolved from a proposed shipping canal to a proposed barge canal to a realized state recreation and conservation area. Covering sections of Citrus, Levy, Marion, and Putnam counties, the CFG is a 110-mile linear park that represents one of the largest public land areas managed by the State of Florida today. The Office of Greenways and Trails (OGT) contracted with Florida Natural Areas Inventory (FNAI) to inventory the CFG for upland invasive exotic pest plants. FNAI inventoried the entire CFG and produced maps showing locations of all documented invasive exotics. Thirty-six invasive species occur in multiple infestations along the length of the CFG. This project was divided into multiple sections (1-6, 7-8, 9a, and 9b, respectively) that were contracted out individually due to the large area to be treated.

Species Treated	Common Name	Rank	Type	Herbicide
Albizia julibrissin	mimosa	I	BB/CS	TRIE±IMZ
Cinnamomum camphora	camphor tree	I	BB/CS	TRIE±IMZ
Dioscorea bulbifera	air-potato	I	FL	GLY+IMZ±MET
Imperata cylindrica	cogon grass	I	FL	GLY+IMZ
Lantana camara	lantana	I	BB	TRIE+IMZ
Ligustrum sinense	Chinese privet	I	BB/CS	TRIE
Lygodium japonicum	Japanese climbing fern	I	FL	GLY+MET
Paederia foetida	skunk vine	I	FL	GLY+MET
Pueraria montana	kudzu	I	FL	GLY±IMZ
Schinus terebinthifolius	Brazilian pepper	I	BB	TRIE+IMZ
Aleurites fordii	tung oil tree	II	BB	TRIE+IMZ
Broussonetia papyrifera	paper mulberry	II	BB/CS	TRIE±IMZ
Elaeagnus pungens	silverthorn	II	BB/CS	TRIE
Koelreuteria elegans	golden raintree	II	BB/CS	TRIE
Melia azedarach	Chinaberry	II	BB/CS	TRIE±IMZ
Melinis repens	Natal grass	II	FL	GLY+IMZ
Pteris vittata	Chinese brake fern	II	BB/FL	TRIE+IMZ/GLY+IMZ
Urena lobata	Caesar's weed	II	BB/FL	TRIE+IMZ/GLY+MET
Wisteria sinensis	Chinese wisteria	II	BB/CS	TRIE

The Greenway traverses miles of forest, swamp, and other natural communities.

Cogon grass grows densely and up to four feet tall.

Prescribed fire can reduce the large biomass of a cogon grass infestation, allowing for more effective treatment with less herbicide used.

Many invaders of natural areas have come from horticultural introductions—sometimes from right next door!

Invasive plant control may include treatment of exotic grasses, vines, and trees in the same conservation area.

Anclote Key Preserve State Park

County: Pinellas, Pasco
PCL Size: 436 acres

Project ID: WR-082	200 acres	$95,900
Project ID: WR-085	60 acres	$30,000
Project ID: WR-087	218 acres	$122,326

Project Manager: Florida Park Service (DEP)
Sally Braem, Environmental Specialist
#1 Causeway Boulevard, Dunedin, Florida 34698
Phone: 727-469-5943, Fax: 727-469-5703
E-mail: sally.braem@dep.state.fl.us

Anclote Key Preserve State Park is the northern-most island in a barrier island chain along the west coast of Florida. The island is approximately three miles long and one mile wide. At its southern end stands a recently restored 1887 lighthouse. Over 25 listed species of wading birds and shorebirds use the island, in addition to numerous migratory birds. A large population of gopher tortoises resides on the island and loggerhead and green sea turtles nest on the beach. Natural communities on the island include beach dune, coastal strand, maritime hammock, mesic flatwoods, marine tidal marsh, and marine tidal swamp. Although little physical disturbance has occurred on the island, most of the upland communities were heavily invaded by Australian pine and Brazilian pepper. Much of the beach dune was a monoculture of Australian pine.

Anclote Key treatment areas were divided into seven zones numbered from south to north. The area designated as highest priority was the fifth zone to the north, containing 33 acres. It is a cabbage palm hammock with little Australian pine infestation and scattered Brazilian pepper. There are also scattered coin vine, coco plum, white stopper, strangler fig, and saffron plum shrubs, among others. This zone is the healthiest condition of all the areas on the island. The project area for WR-082 was zones 3, 4, 5, and 6. WR-085 targeted Zone 2. WR-087 controlled Zones 1 and 7. The US Army Corps of Engineers contributed $9,417 of in-kind match in time and materials to this project. In-house staff treated a two-acre patch of cogon grass.

Species Treated	Common Name	Rank	Type	Herbicide
Casuarina spp.	Australian pine	I	BB	TRIE
Schinus terebinthifolius	Brazilian pepper	I	BB	TRIE

Anclote Key Preserve

Repelling invaders from the beach.

Just another day at the beach... if you're an invasive plant control contractor.

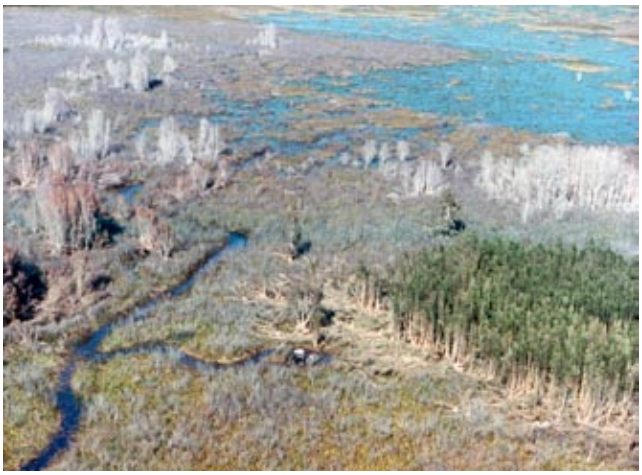
A textbook basal bark treatment.

Melaleuca Program

Melaleuca was brought to Florida in the early 1900s as an ornamental tree. Its fast-growing nature led to it being planted extensively as wind breaks and fence rows. The U.S. Army Corps of Engineers originally introduced melaleuca to Lake Okeechobee in the late 1930s, planting trees on low-lying islands immediately lakeward of the levee to protect against storm generated wind and wave erosion. From these limited plantings, melaleuca spread into many thousands of acres of marsh within the lake.

During the 1980s and early 1990s, the South Florida Water Management District (SFWMD) was the primary source of funding for melaleuca control on public lands. In 1993, the Florida Legislature authorized an annual appropriation of $1 million for the specific purpose of melaleuca control (Section 206.606, Florida Statutes). The Bureau of Invasive Plant Management (BIPM) initiated a cost-sharing program with this $1 million, which the District matches dollar for dollar. This partnership, referred to as the Melaleuca Program, has resulted in over $20 million of melaleuca control to date. BIPM later expanded the program to also provide melaleuca control on non-district conservation lands. At the current level of funding, melaleuca could be eliminated from the Everglades Water Conservation Areas (WCA) and Lake Okeechobee (Lake O) within the next ten years.

Melaleuca Management—Melaleuca became a target of invasive plant control in the 1980s. Initial work was done on Everglades National Park, Big Cypress National Preserve, Lake O, and the WCA. The National Park Service treated 90,717 acres of melaleuca on ENP during 1986 to 1998 and 71,000 acres on BCNP from 1984 to 1997. The U.S. Fish and Wildlife Service treated 8,095 acres of melaleuca on Loxahatchee National Wildlife Refuge (a.k.a. WCA 1) prior to 1987 and 6,755 acres from 1987 to 1998. The SFWMD assisted with these early efforts, as well as treating Lake O and the WCA.



The SFWMD pioneered the aerial treatment of melaleuca by helicopter in the 1990s. During 1994 to 1998, the District aerially treated 3,813 acres of Lake O, 1,643 acres of WCA ('95-'97), and 1,322 acres of the Pennsuco Mitigation Area ('98 only). On areas that are aerially treated, ground crews are used for follow-up and maintenance control. With aerial treatment, large areas can be treated for relatively little cost; the primary factors being helicopter time and amount of herbicide used. Ground control, on the other hand, can cost three to ten times more than aerial treatment, depending upon the size and density of the trees, ease of access to the site, and labor and machinery costs.

In 1993, the SFWMD estimated there were over 500,000 acres of melaleuca in south Florida, with fifty percent on public conservation lands. In 2005, twenty-five percent of melaleuca was on these lands—a decrease of over 125,000 acres through Florida's dedicated funding for melaleuca control. Melaleuca has been completely cleared from Water Conservation Areas 2A, 3A, and 3B, north and south of Alligator Alley. These areas are now under "maintenance control." Today, the melaleuca infestation is no longer increasing; in many areas it is being reduced.

Management Strategy—An effective, integrated management of melaleuca requires a combination of control techniques; chemical, mechanical, and biological. The melaleuca snout beetle (*Oxyops vitiosa*) was released in WCA-3B near Ft. Lauderdale in April 1997. The insect is now established within melaleuca populations throughout south Florida. A second insect, a sap-sucking psyllid (*Boreioglycaspis melaleucae*), was released in November 2002 and is also well established. These two control agents have been observed to severely curtail flowering and new growth of melaleuca.

Effective melaleuca management requires knowledge of its biology. The reproductive potential of melaleuca is tremendous. A mature tree may retain millions of seeds, all of which may be released from their protective capsules following a stressful event such as drought, fire, physical damage, or herbicide application. Once released, fifteen to twenty percent of the seeds will germinate. New trees take approximately two years to mature and produce viable seeds. Follow-up treatment within the second year after the initial treatment is essential to eliminate seedlings before they can produce viable seeds. Under ideal conditions, melaleuca can be eliminated from an area within two years. The first phase of control targets all existing trees and seedlings in a given area. Using GPS equipment, crews return to the same site to remove any seedlings resulting from the control activities of the previous year. The District's control operations consist of three phases:

Phase I. Elimination of all mature trees and seedlings present in an area.

Phase II. Revisiting previously treated sites for follow-up treatment to control trees previously missed and remove seedlings that may have resulted from control activities of the preceding year.

Phase III. Long-term management of melaleuca: surveillance and inspection of previously treated sites to monitor the effectiveness of control and maintain reinfestation levels as low as possible.

The goal of the current melaleuca management program is to contain melaleuca on all District land and to maintain infestation levels as low as possible while minimizing impacts to non-target vegetation. The melaleuca management strategy is based on the quarantine strategy, where the least infested areas (outliers) are addressed first, in order to stop the progression of the existing population. Frill-and-girdle application of an herbicide solution (25% glyphosate, 10% imazapyr in water) is the primary method used to kill mature trees. Aerial application has become essential as control operations are directed to large areas of melaleuca monocultures.

Regardless of the control method used, a comprehensive data collection and evaluation plan is essential for the success of melaleuca management initiatives. Record keeping is invaluable for making future management decisions. Data collection in the District's program includes: longitude and latitude coordinates at each treatment site, date and time of control, type of control method, type of herbicide and amount, method of application, number of trees and seedlings or hectares treated at each site, and labor and equipment hours. The data are used to produce maps of treatment progress and to keep track of individual melaleuca control sites.

Program Expenditures—Due to the increased efficiencies of working through the SFWMD for control of melaleuca in south Florida, BIPM has expanded its program model to include treatment of other priority invasive species, such as Old World climbing fern (*Lygodium microphyllum*), in the south Florida landscape. Lygodium and melaleuca are often intermixed within the landscape, so it is difficult, as well as impractical, to treat one species and avoid the other. In the Loxahatchee National Wildlife Refuge, BIPM provided approximately $1,525,000 to control melaleuca and lygodium within 21,870 acres. Helicopters and ground crews treated over 7,000 acres for melaleuca and nearly 5,500 acres for lygodium. A similar project in Everglades National Park targeted 2,675 acres for melaleuca and 1,680 acres for lygodium, at a combined cost of approximately $425,000.

Other managed areas receiving melaleuca control included the Corkscrew Regional Ecosystem Watershed (CREW), Dupuis Preserve, Model Lands Basin, and the Southern Glades Wildlife and Environmental Area. These projects were in addition to the $1 million that went to SFWMD for maintenance control operations on 13,280 acres of Lake Okeechobee and the Water Conservation Areas. Altogether in fiscal year 2007, BIPM funded over $4 million of initial and maintenance control on over 45,500 acres of public conservation land in south Florida.

Two panoramic views of a melaleuca initial control operation before and after completion.

Lygodium Strike Team Projects

The Bureau of Invasive Plant Management initiated an additional service for conservation land managers throughout the state in 2004. The Bureau hires a contractor to visit individual conservation lands to provide control of small incipient populations of Old World and Japanese climbing ferns (*Lygodium microphyllum* and *L. japonicum*, respectively). This effort targets populations too large for in-house control efforts, but too small to design a formal project around and apply for funding at the working group level. Maximum size for any control area is limited to 10 acres.

The Lygodium Strike Team is an experienced weed control specialist under contract with the Bureau. The contractor provides service to treat lygodium whenever there is a need anywhere in the state. The service includes all labor, materials, equipment, and herbicide and adjuvants, necessary to treat *Lygodium* species. The contractor conducts either a foliar application or a "poodle-cut" application; a modified foliar method where the vines are cut 4-5 feet up the stem and the foliage is rolled up from the base, then all vines on the ground are sprayed.

Treatment is usually with glyphosate herbicide (Roundup™, Glypro™, Aquaneat™, etc.) at three percent, or at two percent with the addition of metsulfuron methyl herbicide (Escort™, Patriot™, etc.) usually at two ounces per hundred gallons of mix. A list of public conservation lands visited by the Lygodium Strike Team and the acres of lygodium treated follows. Total cost for treating 141 acres was $67,065.

Collier-Seminole State Park	1
Estero Bay Preserve State Park	10
Three Lakes Wildlife Management Area	27
Baldwin Rail Trail, Duval County	6
Caloosahatchee Creek, Lee County	2
Hickory Mounds, Lee County	5
Powell Creek, Lee County	3
Prairie Pines, Lee County	2
Yucca Pens, Lee County	3
Danforth Creek, Martin County	10
Delaplane Park, Martin County	4
Gomez Park, Martin County	20
Oxbow Park, Martin County	8
Palm City, Martin County	9
Peck Lake, Martin County	5
Pendarvis Cove, Martin County	8
Phipps Park, Martin County	3
Scrub Oak, Martin County	10
Volusia County Lands ("Pepper Sweep")	5

Herbicide Bank Projects

The Upland Invasive Exotic Plant Management Program established the "Herbicide Bank" to assist land managers in maintenance control of exotics on lands that were part of a project previously funded by the program. The Herbicide Bank supplies the herbicide for re-treatment, while the land manager provides the labor, time, and any other materials required. Depending upon the type of plant, re-treatment is typically needed one to two years after the initial control work is completed. The Herbicide Bank also supplies chemicals for initial control projects where land managers choose to do exotic removal in-house.

In the 2007 fiscal year, the Herbicide Bank provided assistance to over 80 land management units for initial or maintenance control at a total cost of nearly $3 million, which included over 36,000 gallons of chemicals. Below is a summary of costs and acres treated (rounded) for each Herbicide Bank project.

Managed Area	Cost	Acres
Alafia River State Park	$9,389	396
Anastasia State Park	$7,379	22
Atlantic Ridge State Park	*	50
Avalon State Park	*	14
Bill Baggs Cape Florida State Park	$894	35
Catfish Creek Preserve State Park	$1,702	23
Collier-Seminole State Park	$834	75
Colt Creek State Park	$1,043	240
Crystal River Preserve State Park	$138	3
Dade Battlefield Historic State Park	$1,332	23
De Leon Springs State Park	$3,971	76
Estero Bay Preserve State Park	$16,486	140
Falling Waters State Park	$695	168
Florida Keys Parks Techs	$3,029	*
Ft. Pierce Inlet State Park	$8,913	20
Homosassa Springs State Park	$138	4
Indian River State Park	*	115
Islands GEOpark	$5,500	94
John D MacArthur Beach State Park	*	10
Jonathan Dickinson State Park	$3,210	115
Lake Griffin State Park	$1,916	25
Lake Louisa State Park	$2,912	13
Lake Manatee State Park	$2,102	6
Myakka River State Park	$1,539	21
Oleta River State Park	$817	40
Paynes Creek Historic State Park	$792	24
Paynes Prairie Preserve State Park	$5,707	290
Ponce de Leon Springs State Park	$1,588	406
Savannas Preserve State Park	$3,897	30
St. Sebastian River State Park	$4,109	32
Sebastian Inlet State Park	$2,739	510
Silver River State Park	$4,644	227
Terra Ceia Preserve State Park	$10,535	460
Three Rivers State Park	$3,348	405
Tomoka State Park	$1,350	10
Washington Oaks State Park	$1,034	14
Blackwater River State Forest	$37,894	2,240
Four Creeks State Forest	$2,910	150
Goethe State Forest	$811	10
Matanzas State Forest	$2,916	17
Picayune State Forest	$61,755	1,810
Tates Hell State Forest	$21,253	225
Tiger Bay State Forest	$9,600	19
Wakulla State Forest	$238	5
J.W. Corbett Wildlife Management Area	$171,775	*
Salt Lake Wildlife Management Area	$5,303	14
Triple N Ranch Wildlife Management Area	$10,649	50
Juniper Lake Fish Management Area	$2,002	*
Lake Toho Fish Management Area	$1,563	7
Tenoroc Fish Management Area	$518	72
Indian/Banana Rivers Aquatic Preserves	$637	79
Lake Jackson Aquatic Preserve	$703	26
Yellow River Marsh Aquatic Preserve	$771	12
Homeland Tract	$1,214	30
SFWMD Kissimmee Chain of Lakes	$33,531	200
SRWMD Conservation Areas	$1,677	34
Timucuan National Preserve	$558	20
Gulf Islands National Seashore	$403	100
Loxahatchee National Wildlife Refuge	$2,207,256	*
Pelican Island National Wildlife Refuge	$58,874	4,000
City of Largo Parks	$3,903	156
City of Gainesville Parks	$3,651	80
Tree Hill Nature Center	$69	5
Dicerandra Scrub Sanctuary	$2,891	11
Southern Pines Conservation Area	$523	13
South Lake Conservation Area	*	6
Upper Little Manatee River Preserve	$3,132	26
Lake County Water Authority	$3,182	126
North Island-GIBA	$1,900	*
Leon County Greenways	$15,200	800
Halpatiokee Park	$5,999	210
Pinellas County P-2000 Property	$3,278	60
Boca Ciega Millennium Park	$1,783	185
Ft De Soto Park	$482	1,100
McKay Creek Greenway	$2,525	80
Lake Seminole Park	$3,820	250
Sawgrass Lake Park	$5,386	400
Sarasota County Parks	$810	60
Lake Lotus Park	$344	22

TOTALS: $2,807,369 16,844 acres

Uplands Program Operations Summary

Uplands Program Operations Summary 1997-2007

2006-2007					
	Acres Controlled	Cost/Acre	Cost Range	Hours/Acre	Gal Product/Acre
Trees	93,965	$111	$5-$6,580	2.52	0.09
Vines	35,779	$69	$22-$4,600	2.55	0.12
Shrubs-Grasses	7,630	$78	$12-$1,756	1.80	0.13
TOTALS	137,374	$98	$5-$6,580	2.48	0.10

2005-2006					
	Acres Controlled	Cost/Acre	Cost Range	Hours/Acre	Gal Product/Acre
Trees	59,614	$105	$5-$29,288	2.15	0.11
Vines	4,018	$190	$42-$4,458	6.88	0.27
Shrubs-Grasses	13,268	$106	$13-$3,777	2.90	0.16
TOTALS	76,901	$109	$5-$29,228	2.56	0.13

2004-2005					
	Acres Controlled	Cost/Acre	Cost Range	Hours/Acre	Gal Product/Acre
Trees	68,141	$87	$4-$17,169	4.28	0.24
Vines	9,536	$104	$19-$1,783	4.88	0.19
Shrubs-Grasses	8,604	$121	$50-$6,071	3.03	0.19
TOTALS	86,281	$92	$4-$17,169	4.14	0.22

2003-2004					
	Acres Controlled	Cost/Acre	Cost Range	Hours/Acre	Gal Product/Acre
Trees	81,029	$63	$4-$33,300	4.09	0.31
Vines	5,080	$200	$23-$11,856	13.27	0.75
Shrubs-Grasses	10,884	$79	$9-$8,352	1.54	0.10
TOTALS	96,992	$141	$4-$33,300	3.75	0.26

2002-2003					
	Acres Controlled	Cost/Acre	Cost Range	Hours/Acre	Gal Product/Acre
Trees	16,036	$329	$36-$19,678	9.20	0.68
Vines	3,776	$318	$150-$7,577	21.36	1.60
Shrubs-Grasses	3,040	$237	$23-$1,480	21.88	1.55
TOTALS	22,852	$315	$23-$19,678	13.72	1.01

2001-2002					
	Acres Controlled	Cost/Acre	Cost Range	Hours/Acre	Gal Product/Acre
Trees	17,521	$350	$93-$21,667	21.91	0.99
Vines	1,776	$408	$234-$12,997	14.40	0.80
Shrubs-Grasses	3,092	$187	$19-$3,158	8.39	0.26
TOTALS	22,389	$322	$19-$21,667	17.73	0.80

2000-2001					
	Acres Controlled	Cost/Acre	Cost Range	Hours/Acre	Gal Product/Acre
Trees	11,503	$228	$17-$4,918	4.91	0.30
Vines	985	$472	$98-$5,082	7.05	0.16
Shrubs-Grasses	494	$534	$35-$1,786	13.98	1.07
TOTALS	12,982	$258	$17-$5,082	5.39	0.31

1999-2000					
	Acres Controlled	Cost/Acre	Cost Range	Hours/Acre	Gal Product/Acre
Trees	1,964	$727	$60-$5,576	18.75	1.14
Vines	744	$675	$344-$5,186	13.67	1.15
Shrubs-Grasses	390	$808	$517-$2,256	13.81	1.44
TOTALS	3,098	$725	$60-$5,576	16.42	1.19

1998-1999					
	Acres Controlled	Cost/Acre	Cost Range	Hours/Acre	Gal Product/Acre
Trees	1,677	$489	$32-$2,696	18.01	1.03
Vines	804	$354	$149-$1,832	15.41	0.42
Shrubs-Grasses	597	$154	$54-$730	7.66	0.55
TOTALS	3,078	$389	$32-$2,696	15.32	0.78

1997-1998					
	Acres Controlled	Cost/Acre	Cost Range	Hours/Acre	Gal Product/Acre
Trees	1,112	$486	$422-$1,167	25.25	0.39

Acres Controlled, Cost/Acre, and Cost Range include all control projects.

Hours/Acre and Gal Product (herbicide)/Acre are estimated from completed Daily Progress Reports (not available for every project).